Methodological Transformations in Contemporary Political Science[1]

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Abstract

This article seeks to identify, map, and understand a set of institutions – understood as values, beliefs, and parameters – that structure the scientific knowledge in political science over the past 20 years. Its basic purpose is to map the "fundamental" values that had produced a new paradigm for academic production in the contemporary political science. The central argument of the paper is that Political Science is moving throughout a methodological transformation in which causal inference is pursued by means of several research design types, condition I named as inferential pluralism.

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1. Introduction

A detailed examination of high-impact journals in contemporary Political Science reveals a high number of transformations in the "scientificity" of political science over the past two decades. Although political science still studies classical themes such as collective action, electoral behavior, democratic institutions, or the paradox of voting, the substantive nature of the knowledge produced today is considerably different than it was a quarter of a century ago. Political science is going through a massive redefinition of its methodological bases, its technology, and its conception of what "science" is, in such a way that, from an objective standpoint, producing knowledge in political science today is a substantially different task.

As it is widely known by institutional theories, "changes" usually occur through the introduction of new values, beliefs, or parameters that are shared by the agents, organizations, and institutions that produce the action. In the case of the scientificity transformations in political science, which is of particular interest to us, it is plausible to state that there is a set of new shared institutions[3] in the scientific community that have substantially altered the way of producing, organizing, and diffusing scientific knowledge from at least the 90s. The current production of valid knowledge requires of political scientists the adherence to a set of values that give meaning to the new standard of scientificity observed in the discipline.

Understanding Methodology, in its broadest sense, as the systematic study of the rules that give meaning and validate the production of knowledge we are, ultimately, concerned with comprehending the precise form "Methodological Transformations" have occurred in the Political Science scientific community. These transformations, produced by the introduction of a new set of beliefs and values considered necessary and sufficient to give "scientificity" to political science, deeply affect the rigor, nature, and meaning and logic of the knowledge produced in the past decades.

Comprehending these institutions in the particular case of contemporary political science is the basic motivation of this article. It is focused in presenting in a broad and systematic way the specific set of "beliefs, values, and parameters" that, in an integrated fashion, allowed the structuring of a new conceptualization of scientificity. The main question this paper aims to answer is precisely: "what are the values and beliefs that shape the production of knowledge in political science, and why do these introduce a new concept of science to the study of politics?".

To answer this question, this paper looks to identify, map, and understand more broadly the institutions – understood as values, beliefs, and parameters – that structure scientific knowledge of politics currently, backed by an ample examination of works published in scientific journals over the past 20 years. For the sake of parsimony, we will call contemporary political science "post-kkv political science[4]". A considerable part of these beliefs and values emerge from the large methodological production that flows from the crucial work Designing Social Inquiry (King, Keohane, and Verba, 1994), which has reconfigured methodological debates within political science since.

3 In contemporary institutional theories there is a broad conceptualization of what are "institutions". I align here with Ostrom and Hess (2011. p.42), who define institutions "as formal and informal rules that are understood and used by a community. Institutions, as we use the term here, are not automatically what is written in formal rules. They are the rules that establish the working "do's and don'ts" for the individuals in the situation". For this paper in particular, agents are the researchers and the knowledge-producing institutions; and the behavior to be understood is the production of knowledge in political science.

4 The use of "post-KKV" was influenced due to Mahoney (2010). He elaborates an analysis of the transformations in the reflexivity of the so-called New Qualitative Methodology field for political science, produced by the book Designing Social Inquiry. Several key works in contemporary methodology have used this work as a watershed in precipitating substantial transformations in the way of perceiving political science, especially when it comes to the issue of being guided by inferences and the unification of the quantitative and qualitative logics.

The basic goal of the paper is, therefore, to map the "fundamental" values that offer a new scientificity for contemporary political science in an integrated way. This mapping will be conducted from the identification of the main constitutive elements that "give meaning" to the production of knowledge in post-KKV political science. I will identify these values from dimensions considered essential by the scientific community.

The central argument of the paper is that Political Science is going through a profound transformation in its scientificity over the past two decades and this is what differentiates it from other social sciences fields. There is an introduction of new institutions in political science that given meaning to the new standards of scientificity. These institutions are understood from seven interconnected dimensions. The first dimension is the Growing Concern with Causal Inference, where a growing concern with causation in Political Science is observed, especially with the production of causal inferences. More broadly, it is observed that several logics of how to produce inferences coexist, developing what Rezende (2015) conceptualizes as *inferential pluralism*.

The second dimension considered is Orientation by Hypothetico-Deductive Models, which finds support in the extensive implementation of the so-called Empirical Implications of Theoretical Models (EITM). These gain ample space in the formation of new generations in political science. Political science is substantially guided by the adoption of hypothetico-deductive models (H-D), with an emphasis in hypothesis testing, massive use of formal models, and a deep interaction with econometrics and statistical analysis.

The third institution considered here is the connection between Research Design and Inferential Quality. The central importance of research designs as elements considered fundamental to create inferential quality is pivotal condition for KKV political science. This relationship has enabled more and more the coexistence between several types of research design, which become more rigorous to elevate the chances of producing inferential quality.

The fourth fundamental institution resides in the Integration of Quantative and Qualitative Methods as desirable scientific research. Political science has broadened its possibilities to allow plausible alternatives that boost the advantages of studies that adequately mobilize the logic of the "two cultures" (Goertz and Mahoney, 2012). The integration of methods becomes an ideal more valued and sought after in contemporary political science.

The fifth dimension compared here attempts to understand Analytical Eclecticism, which has been one of the fundamental presuppositions of scientificity. This is when scientists start to soften the traditional "paradigmatic barriers" between theories to increase explanatory power and deal in a more satisfactory way with the usual gap between theories and useful applications. Contemporary political science has been progressively "pushed" towards handling more complex problems without losing theoretical rigor. Analytical eclecticism proposes clear alternatives in this direction, and it has been one of the important constitutive elements in the beliefs regarding the new scientificity in political science.

The sixth dimension considered is the Growing Demand for Causal Identification. Much influenced by the interaction with applied econometrics, contemporary political science, especially one more empirically-minded and concerned with inference, has increased its attention towards the need to understand more closely identification strategies. The demand for more precise inferences, understood as parameter estimation, begins at a clearer search for identification.

Lastly, another institution that is considered fundamental is the Primacy of Methods over Political Analysis. Over the last few years, political science has gone through an adherence to the known argument by Rubin (2008) that "design trumps analysis", in which methods have prevalence over analysis. In economics, this statement structured a complete "credibility revolution", in which research designs and inference production methods became much more rigorous. This belief has had similar impact (although with less intensity) in political science, enacting a situation that can be known as the primacy of methods (and research designs) over political analysis. Considerable empirical evidence of this process has been the progressive strengthening and institutionalization of the "political methodology" disciplinary field over the past 20 years.

The paper is structured thusly. In the first section, the conditions that made contemporary political science be fundamentally different at present are more broadly discussed. I will focus on four key factors: the notion of cosmopolitan political science proposed by Norris (1997); the publication of the work by KKV in 1994, which redefines beliefs concerning scientificity in political science; the considerations by Shapiro (2004) on the issue of the disconnect between political science and the problems of reality (usually referred to as "flight from reality"); and finally, the extensive technological and informational changes that condition the production of knowledge in political science. Next, each of the beliefs considered fundamental in this paper[5] are analyzed "in isolation" in each subsection. Lastly, final considerations are offered and their basic implications for the "practical" production of knowledge in political science. The goal is to broaden the awareness of researchers in understanding the larger "context" in which each work done in political science is inserted in, being profoundly affected regarding its scientificity.

2. CONTEMPORARY POLITICAL SCIENCE AND ITS CONDITIONING FACTORS

In the 1990s, the conditions were gathered to enable an ample set of transformations that occurred in the scientificity standards within Political Science. These changes are, in large part, furthered by some endogenous factors that are associated, on one hand, to the methodological developments that happened within the discipline; and, on the other, as a result of important exogenous factors that were produced from broader changes in the economy and society[6].

The key endogenous factors identified in this paper are, essentially, three[7]. First, the notion of Cosmopolitan Political Science, proposed by Norris (1997), which begins to represent the "shared" nature of the beliefs and values that guide the production in political science, especially when it comes to research agendas, theories used, and essentially the methods and techniques mobilized by the scientific community. The second is directly associated with the methodological impact of the work Designing Social Inquiry by King, Keohane, and Verba (1994), which introduced new scientificity parameters and, especially, brought to the surface the need to focus on the issue of causal inference in political

5 For the sake of parsimony, it is important to realize that each one of these beliefs would require a more extensive treatment than what is offered here. The goal is not to conduct an "exhaustive review" of the methodological literature, for the sake of objectivity, to give the basic elements that allow to minimally comprehend the relevance of each for the transformation of scientificity in political science. It would not be an exaggeration to state that, in light of the enormous literature available, each section would need an individual article.

6 As it is widely known in theories of change (Mahoney and Thelen, 2010; Rezende, 2012), these are best explained by gradual approaches in which the endogenous and exogenous causes are considered.

7 These factors were selected to ensure a good reduction of the problem and to identify the main conditions that brought about a substantial modification of the values concerning political science's scientificity. These factors unleashed a series of other intentional and unintentional consequences on the organization and scientific production in the discipline and cannot be explored here due to space.

science. Lastly, I consider as fundamental the important reflection proposed by Shapiro (2004), which puts forward the issue of the gap between theory and reality in political science and points to the imperative need of using political science to deal with relevant problems attached to empirical reality.

Regarding exogenous factors to be considered in the analysis, I will mention the important dimension of scientific production in contemporary political science being conditioned by the transformations brought about by processes of diffusion of democracy, globalization, and especially, the associated technological changes. The most visible effect of these processes on political science's scientificity is structured from the ample availability of new technologies, data analysis software, and databases (information). In a radically distinct way from any other period in the history of the discipline, political science has plenty of resources to produce scientific knowledge.

Analyzing production in important European and North American journals between the 1970s and 90s, Norris (1997) gathers evidence to argue that Cosmopolitan Political Science is a reality. Indeed, political scientists, in several contexts and realities, have focused on ever more similar research problems, methods, and techniques. Consequently, the intensification of globalization and the increased interaction of researchers from diverse traditions, deepened over the last quarter of a century an intense process of "isomorphic convergence" of research agendas, concern with methodological rigor, and theoretical sharing, as well as the proliferation of analytical strategies for the development of inferential compared analysis.

To Norris, the condition of Cosmopolitan Political Science introduces an important set of transformations that decisively impact values concerning scientificity. The professionalization of practices and values from sharing regional and national institutions enables, on one hand, that the standards of production be more and more "globalized". On the other hand, an intensification of the sharing processes of the knowledge produced regarding research problems, methods, and theories becoming more common is observed.

Concerning scientific production itself, given the notion of sharing, cosmopolitan political science is guided by five key processes. Methodological convergence becomes a growing reality. Political scientists become more "engaged" by methodologies that are shared more. The convergence of research agendas among different realities. The increase of internalization processes of scientific publications. And a considerable expansion of shared publications involving authors from different realities.

The second endogenous factor considered in this paper is the important contribution by KKV (1994) in Designing Social Inquiry. This pivotal methodological work launches the framework for introducing new scientificity standards. Based on the presupposition of science as a shared activity[8], the authors highlight a conception of scientificity based on four fundamental values: a) the centrality of causal inference; b) the primacy of methods; c) more transparency in scientific production; and, d) the uncertainty of the knowledge produced.

The crucial contribution by the authors is due to focusing on causal inferences and its connection to research designs. Inferential quality in political science is desirable, possible, and linked to research design. In an original way, they argue that quantitative and qualitative research traditions are similarly guided by the same rules of inference.

8 KKV (1994) consider that scientific activity as a shared among values by the scientific community. They state that "science at its best is a social enterprise" (p.9). The authors believe that the distinctive feature of a scientific contribution is a combination of two elements: adherence to the scientific principles and using "public" methods and procedures to produce valid causal inferences.

Consequently, post-KKV political science, as an empirical science, was unprecedentedly guided by the pair research design-causal inference. Research designs may grant quality causal inferences, increasing reliability, validity, transparency, and honesty in the analyses. To do so, they must be aligned with the rules of inference.

This methodological orientation profoundly changed the scientific status, rigor, and research practices within the discipline. Post-KKV political science introduced a new universe of problems and methodological issues concerning to matters of causation, inference, estimation, modelling, and more broadly, the quality of research designs. The institutional consolidation of the field known as Political Methodology, which will be explored further down, is a direct consequence of this professional concern.

Another argument considered an important reference in transforming the discipline's scientificity was the one made by Shapiro (2002), backed by a strong critique of the "pathologies" of Rational Choice models that became hegemonic in the discipline in the 90s. Shapiro believes that Political Science must be useful and solve the so-called "flight from reality" problem, which expresses the usual gap between theory (and methods) and real world problems.

The main issue faced by a science that is strongly rigorous, formal, and guided by causal inference, is its "natural propensity" to distance itself from problems that affect the real world and actually matter (from a theoretical and empirical standpoint). Shapiro believes it necessary that Contemporary Political Science be concerned with a stronger adherence to being relevant to real world problems.

This presupposition's main overall implication is that models and theories developed within the discipline must be continuously confronted with relevant and empirically treatable problems. There is nothing wrong in establishing the scientificity of the discipline on causal inferences but, it is necessary that political science be capable of creating useful knowledge.

Having presented the endogenous factors that contribute towards the transformation of scientificity in Political Science, I will examine the exogenous factors. I highlight the important fact that production of knowledge in the discipline today is strongly conditioned by technological transformations promoted by combined processes in democracy, globalization, and changes in the sense of an information society, which become prevalent in the 1990s.

Scientificity in Political Science is radically altered by the unprecedented affordance of technological resources and the growing availability of information (and access) in the form of databases shared by researchers. Political scientists currently count on a massive array of tools to collect, organize, and analyze data, a fact that makes knowledge production ever more "shared" among different realities and able to accomplish analytical tasks that were unthinkable 20 years ago. The breadth of analytical possibilities becomes vastly larger at present.

Arguably, we are experiencing a political science in the "big data" age, in which a massive amount of data is produced and accessed at an astonishing speed, by scientific knowledge "producers" and "consumers". Monroe (2013) states that there are five fundamental characteristics that guide big data production in Political Science: volume, variety, velocity, vinculation, and validity. The scientificity standard exhibited by the discipline enables the increase of interactions between computational science, political science, and the so-called data science.

Monroe et alli (2015) believe that the interaction of Political Science with these fields has introduced substantial innovations for collection, manipulation,

management of data, information extraction, as well as an ample set of inferential techniques such as "statistical or machine learning". The authors argue that the use of "big data" is perfectly compatible with the production of better causal inferences or with the methods mobilized by political science or, more broadly, by the social sciences.

Producing scientific knowledge in a context in which a considerable quantity and diversity of data is produced on the interaction of individuals and groups, on a large variety of issues, has introduced a series of new interaction possibilities with formal models and inferential strategies that enable the development of substantial innovations. They offer an interesting discussion on how these innovations have contributed towards political science producing better experimental designs; making better comparisons between populations of interest; and creating more relevant observations on social and political behavior that were difficult to be ascertained by more traditional approaches.

The availability of data has been accompanied by an expansion in the offer of data analysis technologies at the individual or organizational levels. An important visible manifestation of this process is the ample availability of data analysis software which may be completely accessed by individual researchers, organizations, or teaching and research institutions, such as R, Stata, SPSS, SAS, NVIVO, QDAMAX Plus. These tools create a new frontier of possibilities in the production of more sophisticated analyses, whether in the quantitative research tradition, qualitative, or mixed-methods.

The amount of resources created by these packages contributes to a considerable increase in the dialogue between political science and fields such as mathematics, statistics, and econometrics. The qualification to adequately handle these tools has been an important addition in the training of new generations of political scientists. A careful examination of the main high-impact journals enables the observation of a proliferation of new techniques, methods, and data analysis possibilities that are mobilized by the current production which is immensely different from the what was done before the 1990s.

Teaching and training focused on methods using these packages has become an important "disciplinary" factor in the institutionalization of political science. Rare are the political scientists presently who do not spend a considerable amount of time in qualifying for the use of these tools. For example, currently, platforms such as R have been an important drive for political scientists to quickly get on board with a larger investment in programming activities to better handle the ample resources of this tool. The possibilities enabled by R for producing graphs, data analysis, and tasks such as online extraction of information, for example, has systematically attracted the community's attention in substantially investing in these activities.

Beyond the technological resources themselves, there is a new affordance of fast and reliable sharing of observational and experimental datasets among several research networks. This factor substantially reinforces the belief that valid knowledge in Political Science is more and more guided by the assumption of integrating theories and models to empirical data via hypothesis testing. This context opens the borders for dialogue with statistical analysis and econometrics to ensure valid inferences. The access to shared comparative data increases the possibilities for operationalizing concepts developed by theories.

Lastly, it is also clear that these elements allow, in a completely unprecedent way, access by researchers to the journals produced by the discipline. This feature ends up "increasing the degree of sharing" ideas, values, and

beliefs of what comes to be scientificity in political science and enables a growing institutionalization of such "parameters" that guide contemporary production. In the following section, I will focus on seven dimensions considered essential to understanding scientificity in the particular case of post-KKV political science.

3. DIMENSIONS OF THE METHODOLOGICAL TRANSFORMATIONS

This section will analyze "in isolation" each of the seven dimensions presented in the introduction as the main institutions that shape the new scientificity conceptualizations in the present study of politics.

3.1. Growing Concern with Causal Inference

Contemporary political science has as one of its main principles being guided by the production of valid causal inferences. Causal inferential analysis represents one of its fundamental purposes[9] and, therefore, this disciplinary field has sought analytical strategies capable of producing inferences through experimental and observational data. Gerring (2005), with a pragmatic approach on causation, argues that the social sciences must produce empirical knowledge that is reliable, objective, falsifiable, replicable, and inferential. The matter of causation becomes decisive[10].

The connection between scientificity and inference is directly associated with the pivotal argument by King, Keohane, and Verba (1994). As mentioned in the previous section, the authors consider the inferential issue as one of the four fundamental elements of scientificity in political science (and social science, more broadly). The authors propose a necessary connection between research designs and inferential quality, in which the creation of knowledge that adheres more to the "rules of inference" strengthens the quality of empirical research. This work transformed the scientific community's beliefs and behavior regarding the epistemic status of the inferential issue in political science.

In the recent production for the case of political science, the coexistence of multiple paths to reach causation empirically can be identified, going well beyond the estimation of parameters in linear models, as it is typical of applied econometrics. Observing random samples in the publications of the 20 Top Journals in Political Science, Rezende (2015) identifies that political science is strongly characterized by an "inferential pluralism", in which several logics and multiple avenues to generate valid inferences coexist. The basic assumption of inferential pluralism to generate valid causal inferences is that political scientists situated in different "disciplinary quadrants" must have at their disposal multiple patterns of causation. And, unlike in economics, none of these models has a legitimate monopoly on inferential validity.

Due to the strong interest in causal inference to confer scientificity, political science would then move towards two large categories: experimental and observational research, to access causal effects as well as to understand the cause of those effects[11]. As Gerber

9 Empirical data presented by Box-Steffensemeir, Brady, and Collier (2008) reveal that between 1995 and 1999 approximately 33% of articles published in the American Political Science Review (ASPR) and 19% of all journals published by JSTOR, use the expression "causal inference". They note that when the expression. "cause" is considered, this percentage grows to 67% for the ASPR and to 60% for all JSTOR journals. These data tend to grow if we consider the period following the one analyzed by the authors.

10 Quality empirical research has two basic characteristics: to generate causal inferences from collected data and to have this process follow the "rules of inference" (King and Epstein, 2011. p.14).

11 As Przeworski (2009) states, a considerable amount of problems treated by comparative politics involves understanding the impact of variable X on variable, in which usually dependent variables are institutions, policies, or certain events, conditions where experiments are not possible.

(2004) states, the main concrete difference between these two types resides in the possibility of randomization for the data generation.

There are four fundamental logics to understand causation in social science, ones which directly apply to political science: covariational, experimental, and counterfactual models, and causal mechanisms. He argues that there are higher quality inferences and these have four characteristics for which he states some basic principles: (a) "no covariation, no causation" – covariation between causes and effects; (b) "no counterfactuals, no causation" – in which there is no given causal effect when the cause does not operate in a counterfactual reality; (c) "no manipulation, no causation" – in which causal effects may be generated from experimental conditions that are effectively manipulated by the researcher; and d) "no mechanism, no causation" – in which the connection between causes and effects demand the presence of identifiable causal mechanisms (Brady, 2008. p.218).

The basis for these causation models is the logic of potential outcomes, which is known as the Neyman-Rubin-Holland model, originally conceived for experimental designs. Later, as Angrist and Prischke (2009) show, this was expanded for observational research.

The potential outcomes model seeks to "find a solution" to the central problem of causal inference, categorically stated as: it is impossible to simultaneously observe a same unit of analysis being exposed to treatment and control conditions. To generate causal inferences and access effects, counterfactual scenarios (Morgan e Winship, 2007) must be built, that effectively allow comparing the cases. When randomization is possible, counterfactual groups are "naturally" created. The problem becomes more acute when one is handling observational data.

When randomization is not possible, as with observational studies, other techniques such as matching, propensity score analysis, and others are used. The key problem in observational research is how to control "confounders" that tend to substantially affect inferential results when not adequately controlled. Imai et al. (2011) argue that when we are dealing with experimental studies, the mediation effect may be found through the estimator of the difference between means. The authors believe that the main advantage of the potential outcomes model is related to the attention it can give to the problem of causal heterogeneity, usually inadequately grasped by linear regression models, given that it is often "placed" in the error term. Premises of exogeneity are indeed insufficient to understand and identify the causal mechanisms involved in a causal proposition.

Sekhon (2009) believes there are three basic paths to making causal inferences in the political science quantitative tradition: experimental, inferences focused on models, and ones guided by research design. The first goes back to the experimental tradition that was the first formative value in North American political science since Merriam[12], in the beginning of the 20th century. The most frequent path is the one in which inferences are created from models that involve causal propositions, guided by theory, and tested with multivariate regressions. The more modern tradition focuses on research design. Nonetheless, research designs almost always seek to build alternatives to experiments to overcome imperfect experimental conditions for generation of causal inferences, as I will discuss further on.

Presently, without exaggeration, it can be argued that without an adequate research design to access causal inferences, it is unlikely that econometric or statistical

12 To understand the role of the experimental tradition in North American Political Science in its formative years, see Merriam's (1921) pivotal paper.

analysis can create knowledge that goes beyond covariation relationships between variables. The presence of artificial control conditions, manipulability, and crucial attention to research designs (and the conditions under which they must be applied), shows itself to be vital in producing valid causal inferences. This belief has been altering political science considerably, towards building research designs – experimental, quasi-experimental, or comparative – that truly produce more inferential knowledge. This feature has increased the degree of rigor and methodological sophistication in recent production.

One of the characteristic effects of this logic resides in the growing relevance of the "inferential problem" in the empirical political science of several countries. As econometrics, political science seeks to attain the causal-inferential model for production of knowledge as an ideal. Possibly, political science would be more systematically nearing the "ideal model of empirical research" proposed by Angrist and Pischke (2009) in econometric analysis. For these authors, modern empirical science must, therefore, be supported by empirically treatable causal questions and must, necessarily, contain in its analyses the following foundational elements: (a) a causal proposition; (b) "an ideal experiment"; (c) identification strategies; and, lastly; (d) causal inference.

The growing importance of inferences has become a reality in the construction of research designs that come considerably close to the "experimental ideal". Indeed, in political science, as I argue later on, this concern is translated in the proliferation of innovations of more rigorous research designs. In political science, a broad ecology of possibilities coexists, involving experiments, quasi-experiments, comparative studies, and case studies (e.g., Gerring, 2005; Rohlfing, 2012) to generate valid causal inferences. This distinctive configuration enables the idea of inferential pluralism.

3.2. Orientation by Hypothetico-Deductive Models

The production in Contemporary Political Science is strongly organized by compliance with hypothetico-deductive models (H-D). This belief represents a clear alignment with the creation of falsifiable theories, orientation by formal models, and essentially, the intensive use of hypothesis testing. The founding concept is that theories developed must allow for empirical confirmation. This value attributed to H-D models brings about the need to make political science closer to economy, reaching beyond being a merely discursive science.

H-D models are constructed from simple logic. Theories and formal models are built in ways that allow empirical falsification; from these, implications in the form of hypotheses are made, ones which are tested with empirical data. The corroboration of theories using statistical methods and data analysis techniques represents the fundamental element. Therefore, the Popperian principle of scientificity attached to falsifiability still finds substantial room.

This belief regarding hypothetical models became institutionalized in Political Science in the 2000s, with the formulation of the Empirical Implications of Theoretical Models – EITM, a program developed by the Political Science Program of the National Science Foundation. This program has had substantial impact in guiding scientific research since then, with strong influence over the standards of disciplinary scientificity of many countries. This project's impact on disciplinary production, professional formation, and reorganization of the concept of scientificity is of utmost importance to understand the nature of production in high-impact research.

Based on the ideas of the Cowles Commission[13] in the 30s, the main goal of the EITM project is to "reduce the deficit" between formal models and empirical analysis which were pervasive in political science, as well pointed out by Morton (1999). The adequate combination between these two logics allows the introduction of comparative advantages to generate valid scientific knowledge. On the one hand, the project believes that the intensive use of formal models enables the contemplation of deductive modelling strategies from theorems and demonstrations of proofs or computational simulations. On the other, the stronger inclination towards empirical analysis for hypothesis testing demands the intensive use of statistical tools for data analysis.

The use of formal models supposedly introduces a larger demand for clarification regarding key premises and concepts mobilized; introduces a stronger logical consistency which increases disciplinary rigor; and allows, at the same time, more space for identification strategies that can truly understand how certain mechanisms produced certain results in the reality analyzed. For its part, statistical analysis enables a higher capacity for generalization of analysis and aids in taking more robust decisions in the elimination of rival hypotheses based on a multivariate analysis. In addition, statistical analysis allows the identification of causes and effects, treatment of reverse causation, and estimation of the causal effects in a given model.

As Granato et alli (2004) state, the EITM is run on the institutionalization of three crucial elements. The first is the creation of an incentive strategy so that Political Science can base itself on the notion of cumulative production of knowledge. The second element, strongly supported in the presuppositions of the Cowles Commission, seeks to promote scientificity from a larger interaction with disciplines such as economics, statistics, and mathematics, to foster the necessary connection between formal models and statistical analysis. The project's third fundamental objective is to go beyond the proposals of the Cowles Commission and create clear strategies for making causal inferences with emphasis in identification.

Granato and Scioli (2004) show that, within the context of EITM, research in political science is guided by five founding values: (1) orientation by theory, which must be created from case studies, field research, or "research problems"; (2) formal models that can identify the relevant causal connections; (3) deductive analytical strategies from falsifiable/testable hypotheses; (4) considerable measuring effort and attention to research designs; collection, systematization, and data analysis strategies.

The fundamental belief that sustains the project is the notion of connection between theory and data. This feature allows for more explanatory power, more consistent empirical models, and development of relevant deductions in knowledge. The connection between formal models and data enables scientists to construct theories that can indeed be tested, i.e., falsifiable, with data, clearly rejecting the construction of theories that cannot be operationalized or converted into testable hypotheses, as it is still the case in other areas of the social sciences. The test requirement allows the knowledge produced to be more capable of generating valid inferences.

Consequently, the EITM models are not restricted to using quantitative methods for tests. Qualitative analyses may be considered fundamental in validating concepts generated by theory, or even in understanding relevant causal mechanisms. Quantitative and qualitative methods should be considered complementary and supporting of each other. Mixed-methods research should be considered preferable.

13 The Cowles Commission was created in the 1930s by six economists to promote and foster the development of formal methods – mathematical and statistical – of analysis for application in economics and social sciences.

The impact of this important project is decisive in consolidating a new conception of scientificity through continued formation. Aldrich, Alt, and Lupia (2008) reveal that soon after the launch of the program in 2001 by the NSF, the dissemination of summer courses was promoted in important universities such as Berkeley, Duke, Harvard, Michigan, UCLA, and Washington University, involving hundreds of participants. These training sessions were expanded to a large set of Universities around the world. They strongly introduce the notion that research designs centered on formal models and empirical analysis can indeed give credibility to the research.

3.3. Research Designs

As mentioned in the previous section, the "disciplinary effect" created by KKV expanded the methodological reflection surrounding the inferential possibilities and its connections with research designs. The connection between research design and inferential quality represents one of the most important values that affect the high-end production in political science.

Political science has been progressively guiding itself on the classical recommendation proposed by Rubin that "design trumps analysis" and has substantially altered its scientificity, coming remarkably close to initiatives created by applied econometrics. Indeed, political science leaning more and more towards hypothetico-deductive models and causal inference-making, must attempt to understand how research design – experimental or observational – may in fact generate valid inferences. Broadly speaking, research guided by inferences is currently between two logics: experimental and observational.

Morton and Williams (2010) argue that the growing demand for experiments – in its diverse variants – in political science is derived from two basic reasons. First, the continued "failure" by traditional quantitative methods in offering more satisfactory responses to the demand for causal inference. Green and Gerber (2009) believe to be also important the "exhaustion" of observational research designs, leading to a higher demand for experimental models.

One of the most intriguing issues is related to the criteria that motivate the decision by researchers to choose experiments. One of the most satisfactory answers is formulated by Gerber (2004) in the Illusion of Observational Learning Theorem. They suggest that, even with large samples, grave inferential errors may compromise research designs when potential biases threaten the efficiency and consistency of estimators. Facing an elevated bias variance, the data (and the results) generated by observational research have limits to indeed advance inferential knowledge. To overcome such problems, the experiments are considered crucial to expand causal knowledge.

One of political science's most distinctive features in the last decade is the return to "experimental reason", that marked the birth of the scientific study of politics in the 1930s, in the United States. The return to experimentalism comes about with a serious consideration of the use of experimental research design when the conditions are favorable. In its many variants – field experiments, natural experiments, laboratory experiments, survey experiments –, experimental methodologies have acquired consistency, sophistication, and a set of "comparative advantages" to produce causal inferences in contrast with observational studies.

Broadly speaking, the more intensive use of experimental designs in political science emerges as one of the most important methodological trends, and is an important response to four large problems: a) an expansion of the classical models of estimation, through linear regres-

sion; b) an increasing methodological sophistication to control biases and reduce effects of other causal factors; c) an expansion of inferential quality, increasing rigor regarding problems of internal and external validity; and lastly, d) allowing more robust forms of integrating quantitative and qualitative methods.

The superiority of experimental methods in generating causal inferences has produced strong incentives for the concern with the introduction of randomization and manipulation strategies to be taken seriously, to overcome the issue of confounders in the models. This problem represents a serious limitation of analyses that count on observational data alone.

When randomization is imperfect, and data is generated by observational research, quasi-experimental designs become a preferable option in the creation of research designs. Campbell, Cook, and Shadish (2002) suggest that when facing "imperfect" controls and randomization, research designs must be considered as quasi-experimental, a typical situation in which observational studies enable generation of inferences from controls "similar" to ideal experimental conditions. Collier et alli (2004) argue that these designs face obstacles and threats like experiments regarding the generation of causal inferences, which ensures that they are considered "as if they were", to some degree, experiments.

Imperfect experimental possibilities have been a favored field in the rise of considerable innovations in research designs that mobilize observational studies. The problem of how to generate causal inferences when facing imperfect experimental conditions, with strong endogeneity problems (Przeworski, 2007), and the continued problem of omitted variables, as well as other threats to internal and external validity, makes quasi-experiments one of the privileged innovation fields in terms of design for causal effects estimation. For this reason, considerable part of the production mobilizes research designs in the form of regression discontinuity, instrumental variables, difference-in-differences, hierarchical models, and synthetic controls (Abadie et al., 2012).

This field has also been responsible for producing critical innovations in large areas of empirical political science. Therefore, political science would be aligning itself more and more with Angrist and Prischke's (2009) proposition that one of the main decisions in making a research design is associated with the important question of finding "an ideal experiment", so that a specific causal proposition guided by theory can be studied.

The critical aspect of observational research design, typical in social sciences and, in particular, political science, lies in the fact that, even when these conditions are present, there is a strong possibility that confounders or "other non-observable factors" in the difference among control and treatment groups can affect the results. Attention to this problem makes other quasi-experimental research designs be complemented by other ways of thinking and manipulating causation, as with counterfactuals, mechanisms, and inferential strategies with few cases. The key challenge lies in finding alternatives to combine research designs to reduce threats to internal and external validity.

Beyond the quasi-experimental research designs mentioned, it is observed in the particular case of political science, the introduction of three important types of research design that are having more presence in analysis: case studies, process-tracing approaches, and Qualitative Comparative Analysis (QCA). These forms are considered valid to generate inferences, in political science.

Case studies (Gerring, 2004, 2005; Rohlfing, 2012; Rezende, 2011) have been one of the privileged fields in political science, both in the experimental perspec-

tive (usually strong in internal validity) and traditional small-n research. These are considered alternatives to "controlled experiments" when one wants to understand causation with special attention to conditions and causal mechanisms, or deal with problems related with endogeneity.

Processes of formalization and increase in rigor of comparative methodologies continue to point to case studies as legitimate and potentially heuristic sources to create theoretical knowledge as well as causation. Cases do not just produce descriptive knowledge, but also advance it, in a world where phenomena are loaded with endogeneity, causal complexity, and dependency on specific conditions. Cases may be relevant tools to understand the diversity of causal patterns, direction of causalities and, more importantly, to observe the degree of non-spuriousness in each research design. The connection between cases and theories is ever more frequent and recommended as valid analytical strategies.

Approaches such as process-tracing (Beach and Pedersen, 2013) represent valid alternatives when researchers' attentions are focused on diving in the connection between agents, institutions, and contexts to produce satisfactory causal explanations from mechanisms. Attention to causal processes has given substantial relevance to producing inferences centered on causal mechanisms. George and Bennet (2005) argue that process-tracing strategies seek to identify intervening causal processes that connect independent variables to a given dependent variable. These models are ideal when one wants to truly dive into the "large chain" of causal mechanisms that are operating in a given reality, which is usually done through cases studies.

Lastly, political science has also observed the introduction of the so-called set-theoretical methods (Weller and Barnes, 2014). Based on a Boolean logic originally developed by Ragin (1989) to think about causation, these methods mobilize several types of strategies and techniques to formulate concepts, create typologies, and produce causal interpretation[14], such as fuzzy sets QCA[15], crisp QCA, Multi-Value QCA, and Temporal QCA.

Configurational methods introduce a new logic to generate causal inferences from small-n research designs, in which it is possible to understand how conditions – necessary, sufficient, or a combination of these – may create causal analyses from so-called "truth tables". These research designs are especially used when researchers face causal complexity patterns marked by equifinality (multiple causation), joint causation, and causal asymmetry.

3.4. Integration of Quantative and Qualitative Methods

One of the key values for political science goes through the effective possibilities of connection between quantitative and qualitative strategies of analysis to produce causal inferences. Political science has progressively sought to introduce the connection between methods since the original argument proposed by King, Keohane, and Verba (1994) on methodological unification.

The authors argue that there is a common inferential logic between the two research universes. The argument lies in the fact that there are no substantial differences between quantitative and qualitative methods, which must be guided, oriented, and structured by a similar logic for the generation of causal inferences. This basic belief has profoundly altered the scientific community's perceptions on the issue of integrating these two universes.

14 APSA (2014) gives a perspective on the limits of configurational methods for political science.

15 For an updated critique on the limits of fuzzy methods, see Krogslund et al. (2015).

The impact of this argument was crucial. It brought about a significant reconfiguration of the methodological debates within the discipline, especially regarding the use of qualitative methods for producing causal inference and the possible ways of integration what historically coexisted with strong divisions when it came to its logics and purposes. The unifying logic has created a gradual process of eroding traditional beliefs, with the identification of a new moment of profound institutional transformation in the discipline, in which mixed-methods research goes from desirable to ideal.

One of the important impacts developed by this work is the creation of methodological studies, which open new possibilities and frontiers in research design, offering fertile answers to the "problem of methodological unification" in producing causal inferences in qualitative research. Even authors who do not directly agree with this position (Brady, Collier and Seawright, 2004, Mahoney, 2010, Mahoney and Goertz, 2006; 2012) have strongly contributed to bring in "qualitative methods" for reformulation under the parameters of inferential quality.

The problem of integrating quantitative and qualitative research designs represents, therefore, one of the main areas of concern in the recent political science debates and an expressive number of works have been creating opportunities for a larger methodological awareness of this issue. More than in any other field in the social sciences, there is in political science still a strong commitment with causality, causation, and causal inference and reflecting on the bases of the viability of integration takes on a clear importance in contemporary debates. The production of more robust theories, explanations, models, and tests depends on the possibility of promoting more fruitful discussions on how to integrate the quantitative and qualitative paradigms.

The central issue in these reflections lies in the specific conditions that allow thinking of causal inference (and explanation) from a more "integrated" perspective, as ideal. Far from thinking that these discussions immiscible or even incompatible, they are guided by more clearly elucidating the frontiers of integration and differentiation between methods (Rezende, 2011). The fundamental question is understanding the conditions that make possible integration or differentiation between approaches in specific research designs. As the pivotal study by Ahmed and Sil (2012) states, the problem of how to integrate methods in the "objective" reality of practice research takes center stage.

Why is the integration of methods desirable as a scientificity ideal? Fearon and Laitin (2008) argue that the belief regarding integrated research designs has become highly popular in political science and in large part this is due to the recognition of the limits of the validity of traditional quantitative research to produce inferential knowledge. The authors believe that integrated strategies, when well-done, increase the effective chances of combining the power of quantitative analysis with case studies and small-n to increase the chances of better inferences.

On the one hand, the quantitative dimension would be more fruitful to enable the identification of causal patterns and empirical regularities, supported by statistical analysis and, on the other, the qualitative dimension – usually in the shape of case studies and small-n – would be focused on creating knowledge about causal mechanisms that generate the phenomena of interest in certain contexts. The complementarity between the methods would therefore be a desirable "balance".

One of the central arguments for the issue of integration via complementarity is proposed by Tarrow (1995). The complementarity thesis between the methods proposed by him argues that the quality of the integration

depends on how researchers understand the logic, role and the division of labor in these designs. Qualitative researched focusing on identifying the non-systematic dimension of reality and its variation logic among contexts. Conversely, the systematic dimension of reality, usually expressed by causal regularities, must be apprehended by quantitative methods.

The second advantage for integration lies in the argument that it generates better quality of inference and greater error reduction, thus increasing analytical efficiency and explanatory power of comparative studies. The belief regarding the viability of integrated conceptions is organized around the assumption that "shared scientific principles" among quantitative and qualitative traditions such as falsifiability, parsimony, reduction, logical coherence, and validity must be present in research designs to ensure more chances of promoting greater inferential quality.

The growing institutionalization of this belief as one of the most beneficial to operationalize the diffusion of benefits from methodological pluralism (and analytical eclecticism) has been essential in contemporary political science, making room for similar conceptualizations. Clear examples of this integration have substantially influence the standards of contemporary political science's scientificity.

One of them is in the clear tripartite integrative conception to "discipline political science as science", as suggested by Laitin (2002). He is supported by a conception of scientificity that involves the combined use of formal models, statistical analysis, and qualitative analysis focused on increasing inferential quality. The notion of integration is also clear in the formulation "nested analysis" proposed by Lieberman (2005), where the simultaneous use of large and small-n strategies to identify cases, to generate historically situated explanations, as well as hypotheses that can be tested in a larger population, appears as a key factor in the quality of causal inferences.

Known the comparative advantages regarding integration, it is important to highlight that the confection of integrative strategies in comparative research has sensitive limitations.

Although desirable, integration is not always doable, and we need to understand regarding what issues (or topics) these limitations are based on. Understanding these limits, therefore, enables the researcher to understand with greater depth the key issues to create integrated research designs. There are tensions among the qualitative and quantitative approaches, which are decisive in structuring these limits. The first falls on the possibility of integrating ontologies and methodologies; the second lies in the complex matter of multiple conceptions about causal inference, causation, or even causality; the third focuses on the different perceptions of what are external and internal validity; and, lastly, the issue of causal complexity.

Hall (2003) believes that there is a growing disconnect between the "ontologies" of statistical analysis models and traditional comparative methods (qualitative and small-n research), becoming a fundamental dilemma for political science and its inferential possibilities. He argues that comparative models have been trying to incorporate crucial analytical elements such as joint causation, causal complexity, agency, and equifinality, which are incompatible with the fundamental assumptions of traditional statistical analysis.

Therefore, as Ahmed and Sil (2012) argue, the issue of integration is associated with the effective possibilities of ontological alignment and the conceptions of causality of two or more methods. When ontological conditions do not allow integration due to incompatible conceptions of causality (or causation), integrated

research design may, unlike what is supposed, generate errors and inferential problems. This fact is incredibly important given that not always the analytical efficiency of integration would be higher in relation to non-integrated designs. The most important dimension connected to choosing methods lies not in the research question, as some authors mechanically assume, but in the ontological conditions that give meaning to a potential integration of methods. This point aligns with the essential demarcation question proposed in the article. Method does not prevail over ontology, but the other way around.

Another relevant point lies in the perceptions that quantitative and qualitative researchers have on internal and external validity. Research designs usually involve two fundamental questions regarding the "problem of inference": the issue of inferential quality (issues relative to internal validity or credibility); and the issue of the capacity for inferential transfer (external validity or transmissibility). "Possible agreements" are not always present between these dimensions and the research must be aware of when and how these issues must be integrated.

Mahoney (2008) suggests an important integrative look when facing this dilemma, by proposing that the validity of a unified theory of causality which enables that the "language" of variables and causal mechanisms be common to quantitative and qualitative universes. He argues that case studies and multivariate regression analyses have different logics for different purposes: on the one hand, case studies seek to understand why certain results occurred in specific conditions; on the other, regression analyses are made to estimate the mean effect of causes. The analytical power of case studies lies in their ability to identify and analyze causal processes, and in these cases, one can almost always observe intense endogeneity and the presence of causal effects with complex interdependence among the variables.

Ideally, any attempt at an integrated explanation must mobilize elements that inform on the integration of concepts. For quantitative researchers, the ideal position would the one in which concepts are "perfectly" operationalized in measurable variables and hypothesis testing for statistical analysis. This "reduced" version of reality assumes possible that concepts be simple, clear, and objective, allowing precision to be achieved. Qualitative researchers, conversely, usually believe that concepts (and research questions) mobilized by political science are complex, multidimensional, and polysemic, making complex, when not impossible, an adequate generalization for empirical analysis in ideal terms.

3.5. Analytical Eclecticism

Analytical eclecticism represents another important shared value for scientificity in contemporary political science. Originally proposed by Sil and Katzenstein (2012), analytical eclecticism is a plausible alternative to deal with the "flight from reality" problem, raised by Shapiro (2005). This is characterized by the tension between theoretical debates and the demands for practical knowledge in the empirical world, as mentioned previously.

Political science is constantly pressured to offer relevant causal explanations in the face of a multidimensional, dynamic, and complex reality, and well-known for a high degree of endogeneity. These factors, on the one hand, make political explanation demand models and theories with high complexity, since they usually involve causes and causal mechanisms that are situated within institutions, culture, and history, and still demand the presence of rational agents. On the other hand, because it is a science that deals more closely with real life problems that directly affect the lives of large groups, there is a considerable demand on the part of

several knowledge producing bodies to generate useful knowledge that can indeed contribute with intervention via public policies.

To handle all these problems, the strategy suggested by analytical eclecticism is about overcoming traditional research conceptions that tend to be organized by isolated research paradigms or traditions, and starts to combine inputs from several models and theories generated from within the discipline. This belief has been substantially altering the way scientific knowledge is made in political science, especially in its more applied fields, such as international relations or public policy.

The fundamental assumption of analytical eclecticism lies in the belief that, in a context of abundance of theory, models, or paradigms competing for better scientific explanations for problems of high complexity in the real world, it is important to introduce "flexibilization" efforts among research paradigms when producing better causal inferences and relevant knowledge in political science. This perspective requires new ways of thinking about premises, fundamental concepts, theories, disciplinary organization and, ultimately, the connection with actual relevant problems.

The main implication of this belief is that scientific research in political science bases itself on the assumption that no theoretical paradigm solely possesses the legitimate monopoly of analytical superiority. Thus, it is necessary to seriously consider the connection or reduction of barriers between concepts, evidences, and causal analysis created with paradigms traditionally considered "incompatible". This assumption, going well beyond the simple matter of "integration", involves the effort of exploring hidden connections between theories and models in order to produce new approaches and innovations for analysis of relevant phenomena applied to the real world.

The main comparative advantage of analytical eclecticism lies in the increase of possibilities to create conceptual and theoretical innovations and as well as causal explanations produced. Rejecting the position that explanations must be confined to specific boundaries within a given paradigm (which the authors call paradigm-bounded research), eclecticism enables the development of more powerful analyses, creatively and consistently meshing together contributions from several research traditions that are usually mobilized "in isolation".

The eclectic position requires political scientists to progressively abandon their "narratives and preferred models" and start to pursue more satisfactory answers, broadening the scope of relevant causal factors and causal mechanisms involved in the construction of explanations of a particular phenomenon. The broadening of paradigmatic frontiers enables the creatively handling of new analytical possibilities.

Analytical eclecticism must not be mistaken with mixed-methods research in political science. To more adequately understand complex phenomena that involve several dimensions of analysis and require a great dose of contextuality, explanations in Political Science must be more attentive to a gamut of contributions made by several paradigms. Thus, a larger awareness regarding the limits, potentialities, and implications regarding the methodological choices when facing several approaches.

Analytical eclecticism is differentiated from traditional research led by paradigms on three dimensions related to: how research problems are built; the causal strategies for analysis; and the degree of adherence of theories and models to the context. The first dimension is related to the complexity and multidimensionality of the relevant phenomena for political analysis. Research problems often are built by theories that are adjusted

to paradigms. Eclecticism demands the transposition of paradigmatic barriers, as in, enabling the explanation of complex problems. Lastly, eclecticism assumes as necessary to construct theories and analysis that can effectively contribute towards innovations to treat relevant empirical problems.

Analytical eclecticism's fundamental concern is the pressing need to develop greater interaction between theoretical knowledge, analytical models, and the empirical evidence. Useful knowledge must be created from middle range theories that can unravel relevant causal mechanisms in political phenomena. The innovative proposal brought about by analytical eclecticism is about the need to explore new avenues between research traditions, enabling a more intense communication of concepts, mechanisms, theories, and explanations in the face of specific research problems. These assumptions tend to substantially increase the probability of solving the chronic gap between theories and evidence in political science.

3.6. Growing Demand for Identification

As analyzed previously, Contemporary Political Science has focused on generating valid causal inferences. To do so, it uses of empirical research in research designs that formulate several strategies of identification that enable the understanding of how causes lead to the effects in the empirical reality observed. Scientificity then depends on how the problem of identification in the social sciences can be solved (Manski, 1991).

The identification problem lies in establishing if the causal propositions assumed by the theoretical models effectively occur (and are confirmed) in empirical reality, i.e., if the causes indeed are causes and the effects are actually generated by the causes supposed, given observational data. How can we suppose exogeneity of causes when using observational data? That is an incredibly complex problem and substantial analytical energy has been devoted to it in applied econometrics, with considerable impacts on comparative politics.

With experimental designs, this problem is "easily" solved due to randomization and experimental manipulation of causes and effects. However, with observational studies, given the problem of omitted variables (confounders), the demand for empirical strategies of identification make inference issue more complex.

Angrist and Prischke (2009) believe that empirical research seeks to answers questions of causal inference from "ideal experiments", in which researchers aim to better identify to solve problems of endogeneity, selection bias, reverse causation, and causal mechanisms involved in the explanation. It is precisely through strategies of identification that such inferences from observational data are operationalized, and researchers truly seek plausible empirical alternatives to reach the desired causal effects.

The connection between good identification and inferential quality has been decisive in observational research in economics, instigating the credibility revolution, which has had similar impacts on political science. In political science, there has been an increase in demand to handle the identification that accompanies the rigor in the creation of research designs.

Considered as the "critical point" in observational research, identification performs a key role in the quality of research and inferential knowledge produced. With adequate identification strategies, researchers can empirically deal with the usual inferential problems associated with endogeneity generated by non-observable factors or causal complexity caused

by institutions, history, or more broadly, culture, as it is typical in political science.

Attention to possibilities of identification have allowed observational research to produce valid causal inferences. Scientificity depends, in large part, in making theories consistent with observational empirical data. Considering a comparative politics perspective, Przeworski (2009) states that when political scientists cannot control causes, we are completely dependent on history and thus, the chances of good identification are really reduced.

In historical analysis and political science, where the degree of endogeneity is extremely high, this problem becomes acute. For him, comparative political science lives in a paradox: "The better we specify our models, the more endogenous loops we consider, the more difficult it becomes to identify their causal structure." (Przeworski, 2007; p.168). The main challenge when facing endogeneity is in the fact that it is difficult to empirically distinguish the causal effects from the effects generated by the particular conditions in which the studied phenomenon is occurring.

Understanding the problems regarding identification is also discussing the limits regarding internal and external validity in observational research. The demand for identification is one the most important methodological trends and it is an important answer to three problems highlighted by Dunning (2012): a) overcoming typical problems in multivariate regression analyses; b) needing more robust research designs, with the inclusion of field and natural experiments; c) an effective possibility to increase inferential quality through constructing good identification strategies in observational research.

This hypothesis is also supported by the relevant argument proposed by Brady, Collier and Seawright (2006) in Rethinking Social Inquiry, in which the growing demand for a creative dialogue between quantitative and qualitative strategies is needed to enhance the capacity of causal inference in theory production (and hypothesis testing). Thus, experiments arise as a plausible alternative that allows (via other means) the combination of quantitative data analysis and analysis of causal processes.

The demand for identification from quasi-experimental designs may be understood as requirements considered fundamental so that knowledge on the several logics of causation in political science can be generated.

Thus, many authors working on the frontier of empirical research assume that identification strategies are the fundamental dimension in constructing research designs. These strategies are broadly known as the alternatives research designs build to estimate causal effects for specific empirical problems. The central issue lies in understanding how contemporary studies have been mobilizing innovations in identification strategies in research designs centered around quasi-experiments and how these contribute to inferential quality.

Consequently, refining identification strategies would have an important role in increasing "experimental reason" in political science, where the combination of experimental, quantitative, and statistical analysis elements can lead the production of valid causal inferences. Thinking about the identification problem from quasi-experiments means creating the conditions for a more robust inferential causal knowledge, which is needed for the advancement of political science as a discipline.

3.7. Primacy of Methods over Analysis

The last influential belief I consider here has to do with the primacy of methods. This can be clearly identified

in the transformations occurred in recent production, with the advancement and sophistication of methods and techniques applied, as well as institutional efforts to introduce the disciplinary field of Political Methodology. These characteristics have made political science consistent in the assumption that methods represent the crucial elements that create the conditions for diffusion and institutionalization of values regarding a new scientificity. In fact, it is possible to state that political science approaches a "Sartorian ideal" of increased awareness about methods.

The influx of new methodologies in political analysis can be attributed to, on the one hand, the increased interaction with statistical analysis, especially multivariate analysis techniques for hypothesis testing. On the other, a simultaneous expansion of the reflexivity regarding comparative methods is observed, which has substantially incited the real confrontation between theories and empirical data. The expansion of rigor and sophistication of comparative methodologies is clearly associated with an exponential increase of quantitative and qualitative techniques available to political scientists.

Certainly, the orientation by hypothetico-deductive models centered on hypothesis testing via the diffusion of new values introduced by the EITM/NSF program since 2001[16], established the conditions for increasing the degree of rigor and sophistication, both in quantitative and qualitative research. In the quantitative tradition, the intensive use of multivariate techniques in its several variants, or even more sophisticated techniques such as hierarchical models, temporal series, or computational simulations, is clearly observed. The degree of integration with econometrics made so that models and testable theories hit an extremely high degree of formalization and analytical rigor in the current production.

There is today ample discussion in the qualitative research tradition in political science on the limits and potentials of these methods, as well as a large offering of possibilities for inference generation, especially when configurational models or ones based on causal mechanisms are used. Approaches such as process-tracing, case studies, or even the several QCA variants, have introduced a substantial influx of possibilities for developing new methodologies to generate valid causal inferences.

Another important symptom of the expansion of methods as a crucial element of scientificity in the context of the EITM project is the growth in the status of journals that publish papers mobilizing formal models, theory, and empirical data from research designs using a high level of methodological rigor. Data in Figure 1 compare the positions of the top five journals in SCImago Journal & Country Rank (www.scimagojr.com).

16 The diffusion of values regarding Methods in Political Science have been well supported in professional formation by the Inter-University Consortium of Political and Social Research (ICPSR) Summer Courses, created in 1963, at the University of Michigan and the Essex Summer School in Social Science Data

Analysis and Collection, founded in 1967. New initiatives, such as the creation of the Society for Political Methodology da American Political Association, created new opportunities for the massive diffusion of values related to the importance of method and political methodology. In Brazil, the International Political Science Association's (IPSA) summer schools are annually offered by the University of São Paulo USP.

Figure 1 – Political Science Journals

Ranking SCImago Journal & Country Rank 2000; 2005; 2010

ANO 2000	ANO 2005	ANO 2014
World Politics	American Political Science Review	American Political Science Review
American Journal of Political Science	American Journal of Political Science	Political Analysis
American Political Science Review	Comparative Political Studies	American Journal of Political Science
Journal of Conflict Resolution	World Politics	Journal of Conflict Resolution
Comparative Political Studies	Jounal of Theoretical Politics	Annual Review of Political Science
Journal of Politics	Journal of Conflict Resolution	Journal of Politics

Source: the author, with data from www.scimagojr.com.

The data show that journals such as the American Political Science Review, American Journal of Political Science, Journal of Politics, and the Journal of Conflict Resolution continue to maintain their high impact over the years when it comes to diffusion of methods and techniques mobilized by the discipline's mainstream. The novelty emerging from the data and that reflects the recent primacy of methods is the appearance of the journal Political Analysis, as the second main journal in 2014.

This journal has strengthened since its creation in 2006 and it has been the main source of publication for high quality papers that mobilize rigorous and current methodologies in political science. This journal has always promoted innovations in political analysis that massively includes formal analysis and statistical analysis. On the other hand, an analysis of the content of the papers also reveals its relevance as an important diffusion source for sophisticated techniques to integrate quantitative and qualitative methods.

The increased relevance of the Political Analysis journal for scientificity in political science can be "objectively" observed in data from Figure 2. These show that there has been an exponential increase in its impact factor, going from 0,917 to 4,655. This illustrates its power of diffusion of new forms of analysis in the discipline. In addition, it goes from 20th in the ranking (out of 85 journals) in the year it was created, to 1st in 2014.

Figure 2 – Political Analysis: Impact Factor and Ranking (Political Science Journals) 2006-2014

Year Impact Factor Ranking (Political Science Journals)

Ano	Fator de Impacto	Posição Ranking (Periódicos Ciência Política)
2006	0,917	20 (85)
2007	2,535	1 (93)
2008	4,78	1 (99)
2009	3,756	1 (112)
2010	1,864	9 (139)
2011	2,191	5 (148)
2012	2,231	5 (157)
2013	2,879	3 (156)
2014	4,655	1 (161)

Source: http://www.oxfordjournals.org/our_journals/polana/about.html

The importance of journals in the formation and "disciplining" of production is decisive. As it is known, political science follows the trend of other disciplines and is heavily impacted by reading "publications in scientific journals". Undoubtedly that this impact, especially from main journals, ends up creating an isomorphic process of values around what are methods and finally shape the parameters of scientificity in the context of a cosmopolitan political science.

In addition, the primacy of methods can also be observed by the massive production in books on applied methodology specifically for political science. Publishers such as Cambridge University Press, Oxford University Press, and other high-caliber companies have contributed immensely to the diffusion of high-quality works in the field of methodology, empirical research, quantitative and/or qualitative, that significantly expand the discussion and awareness regarding methods in political science[17]. Specific series focused on research were created, enabling the rapid dissemination of beliefs around the demand for methodological renewal in the discipline. It is important to highlight that Oxford University Press published the Handbook on Political Methodology in 2007, making available a collection of works produced by the most qualified authorities on the subject with broad impact on the professional formation in political science.

4. CONCLUSIONS

This paper sought to present a set of key transformations that guided high impact factor academic production in political science over the past 20 years. The changes carried out were "beliefs and values" that quickly became institutionalized in the scientific community and today set an ideal for producing any scientific work in the field. It is possible to state that

17 For obvious reasons of economizing space, examples of these pivotal works are not included in the text. In the references, however, works considered fundamental for the diffusion of the "primacy of methods" are mentioned.

the nature, quality, and sophistication of contemporary production is radically distinct from what was thought of as "mainstream" before the revolution instigated within the discipline in the 1990s.

As discussed, these beliefs and values gain meaning and are diffused by structural transformations generated by endogenous and exogenous pressures within political science. These factors make the "scientificity indicators" completely specific in relation to other social sciences such as sociology, anthropology, law, or even in the humanities. Understanding these values more closely, we can comprehend what "is characteristic in political science". This comprehension cannot be considered obvious or trivial. The meaning of disciplinary scientificity that has been built in contemporary political science makes it an "outlier" in the social sciences that are still focused on methodologies centered around interpretation.

Currently, political science has been guiding itself with values that privilege empirical analysis centered around explanations, the intensive use of research designs, and the growing demand for causation. Rezende (2015) believes that these dimensions are the main constitutive axes that "discipline" academic production.

The new values that guide disciplinary production have been progressively constructed, diffused, and institutionalized, beginning with the institutions that formally organize the discipline at the national and international levels, as well as in the university centers at the undergraduate and postgraduate levels in political science around the world. The speed in which these values are consolidated within the discipline and that decisively affect production when it comes to quality, sophistication, and rigor, make contemporary production radically different than what it was a decade ago. High impact journals have progressively given incentives so that papers are guided by high sophistication, intensive use of formal models, and statistical analysis, both in the quantitative tradition or even in mixed-methods research.

The substantial effort by political science is to clearly promote a stronger "adherence" to rules of inference in a world of big data, technological abundance, and methodological diversity. Thus, it is possible to consider that political science is approaching a "credibility revolution" that has been occurring in economics since the 90s, in which research designs and associated methods take primacy over traditional data analysis. To move from correlations to understanding causation, it is necessary to introduce efforts to create identification, with substantially more rigorous research designs. Political science's connection with applied econometrics has been a natural path to developing this science as an empirical science.

Therefore, empirical political science would be moving towards more interfacing with econometrics, applied statistics, computational sciences, and even mathematics. Orientation by formal models has demanded a bigger understanding of the role of models in the social sciences, and its connection with hypothesis testing. In the case of political science, which is not true for most of the social sciences, the demands for testable, objective, and replicable knowledge takes focus.

Another important factor to consider as foundational reference in scientificity is the return to the experimental tradition (or quasi-experimental), which has been widely used in the analysis of significant phenomena such as corruption, clientelism, performance of institutions, collective action, and a whole gamut of other events that continue to be relevant. Political science today has a large scope of possibilities to produce valid inferential knowledge, whether with observational or experimental data, despite their limitations. Innovations developed by research designs

via experiments or quasi-experiments have allowed advances in a more robust understanding of causal effects or the causes of effects. The impact of these methods has substantially expanded the frontiers of analysis in comparative political science.

Another substantive innovation has been the progressive rupture of traditional cleavages between quantitative and qualitative methods that characterized the discipline before the 1990s. The traditional limits for data analysis techniques have also been progressively eased and, currently, higher standards of scientificity demand that researchers mobilize their creative efforts to produced valid inferential analysis with quantitative and qualitative strategies. The incentive for more integrated productions, despite their known limitations in practical research, has been noteworthy. The issue of integration between quantitative and qualitative methods since KKV has been profoundly formulated, and new paths to develop connections between these "cultures" (Mahoney and Goertz, 2012) have been enhanced in teaching and research institutions in political science.

Lastly, it is worth highlighting the important dimension related to the primacy of methods, which, as analyzed, introduces higher standards of reflexivity by scientists regarding new methodologies and research designs that can, indeed, be more adequate in treating specific research problems. Even in fields less quantitatively oriented, the concern with causal inferences has moved a substantial number of researchers in the comparative historical tradition to adhere to the new methodological "canons" available in the discipline. Political science would thus be moving towards what Sartori, in the 70s, conceptualized as "methodological awareness", needed to promote relevant knowledge when one is attempting to mesh empirical political science and science guided by formal models.

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