

Theorization and Modelling of Law: Some meso to macro models of legal behavior

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Abstract

This paper is part of a larger project – a theory of Law – that purports make theory and practice more inter-relatable thanks to systems theory, complexity and cybernetics modeling of legal behavior. The great aim is to apply computer simulation and modeling to the study of Law.

Here we shall only take up two models of Law, because of space constraints. The first concerns how knowledge about Law, Justice and the Rule of Law is created and circulates. The second refers to what norms are and how they are implemented, along with a brief notion of who are the Law's subjects. These models are applicable on a midrange to macro-scale (cities of a certain size, States, confederations of States and onwards), despite the fact that the implementation model can also be used on small scale-systems like communities, dyads, triads and so on.

The work offered in this study is correlated with the Law and Society approach to legal empiricism, and I conclude that theory and practice holds a recursive relation: theory without a practical referent is fiction and practice without theory is blind development. Computer modeling is a way to further the complementary relationship that both ought to hold.

I. Introduction

The Law and Society Movement – which rose from American Legal Realism and came as a response to legal formalism in the 1960's – has become increasingly important in the wake of growing complexity within national and international legal frameworks. This complexity has forced lawyers and scholars to deal with concrete problems and contexts instead of taking a top-down approach where a theory would be used to organize and systemize an existing mass of norms and legal relations.

Law and Society depicts Law as a culturally and structurally embedded social institution, seeking to analyze it by empirical means; despite of a lack of consensus on how to define it, it is understood that Law and Society are nested in one another. Their fundamental approach consists of making a differentiation between “law-in-action” and “law-on-the-books”,¹ centering on the former, and emphasizing the ways in which extralegal social processes continuously construct and reconstitute the meaning and impact of legal norms.² In her introductory book to the Law and Society approach, Calavita summarizes this difference masterfully:³

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1 This distinction was first made by *Roscoe Pound* on 1910 on his seminal article *Law in Books and Law in Action*, *Harvard Law Review*, Vol. 25, No. 4 (1910), 489, 502.

2 *Lauren Edelman & Mark Suchman*, *Legal Rational Myths: The New Institutionalism and the Law and Society Tradition*, *Law & Social Inquiry*, Vol. 21, No. 4 (1996), 907, 908.

3 *Kitty Calavita*, *An Invitation to Law and Society. An Introduction to the Study of Real Law* [http://lawlib.shirazu.ac.ir:8080/pdfTemp/ebooksclub\[1\].org__Invitation_to_Law_and_Society__An_Introduction_to_the_Study_of_Real_Law__Chicago_Series_in_Law_and_Society_.pdf](http://lawlib.shirazu.ac.ir:8080/pdfTemp/ebooksclub[1].org__Invitation_to_Law_and_Society__An_Introduction_to_the_Study_of_Real_Law__Chicago_Series_in_Law_and_Society_.pdf)

Gaps between the “law-on-the-books” (the sign indicating no access) and the “law-in-action” (the de facto policy of granting access) are a central concern in law and society research, and the pervasiveness of these gaps is one of the field’s founding ideas. Sometimes the issue is routine nonenforcement ... Sometimes the pattern reveals selective nonenforcement ... The disparate treatment implicit in vagrancy, loitering, and anticamping laws reflects the economic interests and biases of class societies, joined in the United States and other racialized societies by racial stereotypes. Sometimes such law-on-the-books and law-in-action gaps are the result not so much of class or race biases – or even ulterior motives like those implicit in the drug-dealers’ tax – but of structural dilemmas faced by policymakers and enforcement agents.

Three aspects of the Law and Society as a practical program were stated by Phillip Selznick in his article on the Jurisprudence and Social Policy program of the University of California at Berkeley:⁴

Law and Society as problem centered inquiry: Its starting point is the experiences of the populations and the individuals that constitute institutions; genuine problems emerge from practical experience. It is integrative because it brings to bear every relevant intellectual resource and normative because it postulates a state of well-being in the light of which existing arrangements are to be assessed.

Law and Society as Law in context: Law is always part of a larger normative order; it begins with an understanding that “positive law” is only part of a larger sphere. Historical, sociological, economic, political, and psychological foundations of legal rules and policies are to be explored. Also, social change is a central concern; Law in society suggests that rulemaking, sanctioning and adjudication are pervasive aspects of social life and that their legal forms belong to a continuum.

Law and Society as Law in action: The legal order is more than a system of norms and rules, it is a set of agencies responding to social needs and pressures; the latter are subject to the vicissitudes that beset any human institution and they also face the dilemmas of lawmaking and administration. Thus, studies of law in action take place in a world of pressure, constraint, and opportunity; principles, policies, and rules form only in a part of the environment of decision.

The downside of the approach of Law and Society is that it brings forth myriad narratives that sometimes contradict one another because they view the same phenomena from different angles; furthermore, the implementation of empirical studies presuppose theoretical approaches to Law, politics and social relations, which vary from one practitioner to the next.

Empiricists are wary of theories of Law because traditionally, they have been created with an abstract approach that simplifies the nuances of the social relations that underlie Law. The purpose of this paper is to offer models of legal behavior based on circular causal relations, where the effect feeds back into the cause in an ongoing process; these capture the complexities of sociolegal reality better and can help to unify different narratives into a coherent whole.

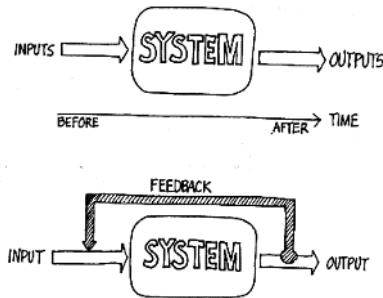
4 Philip Selznick, *Jurisprudence and Social Policy: Aspirations and Perspectives*, 68 *California Law Review* 206 (1980), 215, 216.

This paper develops two models of legal behavior, which can be applied to the meso to macro scale, but it is part of a larger project: a Theory of Law. Due to their circularity and the fact they embrace concepts that can be found in computer science, these models enable computer modeling of legal behavior, which then can lead to macro-level visualizations that allow for maxim knowledge and experience to be gleaned from consulting these models. Thus, the approach to Law that I intend to offer complements and is complemented by the Law and Society approach.

II. Basic concepts

As this article is part of a larger and more complex project, it presupposes several concepts of cybernetics and cognitive science. The ones that I will explain for the purposes of this study are the following: circular causality, epistemological constructivism and sociological levels of analysis.

Causality is understood in a linear way when a cause is followed by an effect; however, it can also be seen from a circular viewpoint: the cause is controlled or affected by its own result.⁵ This is called a feedback loop. Information processing systems have inputs, which are consequences of the environment's influence on the system and its outputs, which in turn are the impact of the system on the environment.⁶ In every feedback loop, information about the result of a transformation or an action is sent back to the input of the system in the form of input data. Feedback can be illustrated in the following manner:⁷



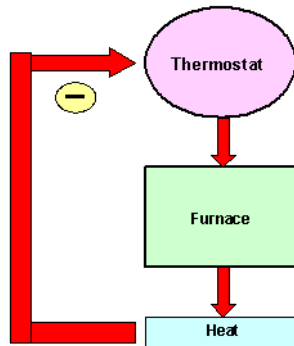
One example of feedback loop can be found in a thermostat. In order to keep a stable temperature in a room, it has a sensor that perceives changes; if the room is too cold, it sends a message to the furnace to produce heat, the effect of which is picked up by thermostat. A rise in the temperature will make the thermostat send another message to the furnace, making it stop. If temperature lowers anew, the cycle will begin again. This can be illustrated as follows:⁸

5 Francis Heylighen and Cliff A. Joslyn, *Cybernetics*, www3.lanl.gov/pub/users/joslyn/encs2.pdf

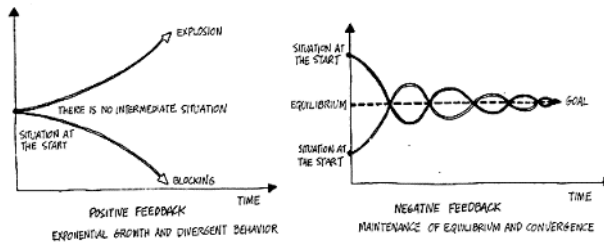
6 Principia Cybernetica Web, *Feedback Definition*, <http://pespmc1.vub.ac.be/FEEDBACK.html>

7 *Ibid.*

8 Image taken from: http://www.occc.edu/biologylabs/Documents/Homeostasis/Negativve_Feedback.htm



Feedback processes can be of two types: positive, when new data allows and accelerates the transformation of input to output in the same direction as the preceding results, thus having cumulative effects and deriving in exponential growth;⁹ and negative, when new data produces a result in the opposite direction to previous ones, stabilizing the system and maintaining an equilibrium.¹⁰ These types of feedback can be visualized as follows:



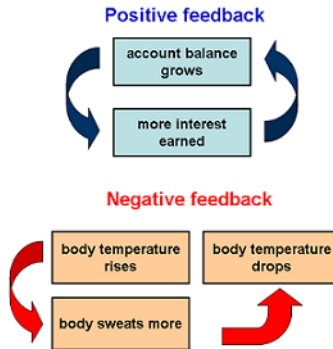
By means of its cumulative effects, a positive feedback left unchecked can lead to the destruction of the system; this behavior needs to be controlled by negative feedback.¹¹ An example of negative feedback is that of the thermostat, which is also similar to the way the human body regulates its own temperature. An example of a positive feedback can be found in the growth of an interest-earning savings account; assuming money is not withdrawn, when interest is accrued, the principal will grow, the more the growth, more the interest accrued and so on.¹²

⁹ *Ibid.*

¹⁰ *Norbert Wiener, Cybernetics: or Control and Communication in the Animal and the Machine*, (MIT Press), 97.

¹¹ *Ibid.*

¹² National Oceanic and Atmospheric Administration, *A Paleo perspective on abrupt climate change* <http://www.ncdc.noaa.gov/paleo/abrupt/story2.html>



A very important notion for this article is that of constructivist epistemology, a theory of knowledge that centers on the active participation of the subject in building representations of reality. Instead of reflecting or representing it, rejecting the idea of an objective ontological reality perceived passively by means of the senses, creative construction occurs through interpretation and is incorporated in the perception of organisms and in their cognitive processes with memory acting as a reference point.¹³

Representations are made by distinguishing one thing from another and assigning them a meaning in relation to itself; all representations of reality are thus self-referential, which leads to von Foerster’s definition of cognition as “Cognition computing descriptions of a reality”. The observer – which can be any living system – defines and redefines his boundaries and interactions with his surroundings based on what he perceives and what he knows; cognition becomes an infinite recursion of descriptions of descriptions that ends only when the observer ceases.¹⁴ Maturana and Varela proposed the following example, which stemmed from an experiment with frogs:¹⁵

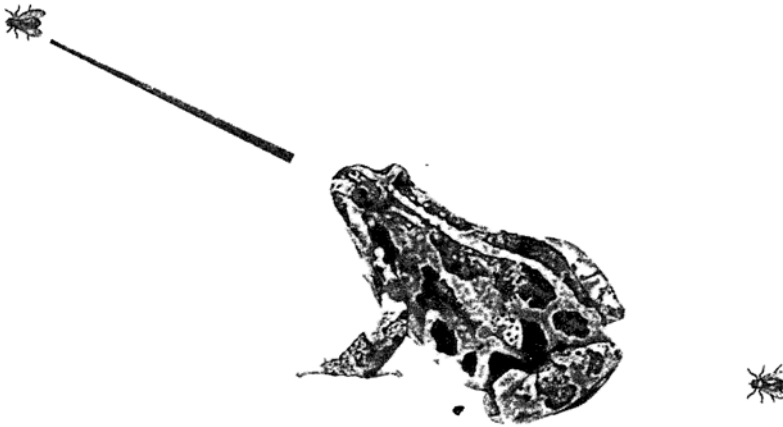
... We can take a tadpole, or a frog’s larva, and with the careful hand of a surgeon, cut the edge of the eye – respecting its optic nerve – and rotate it 180 degrees. The animal thus operated is left to complete its larval development and metamorphosis until it becomes an adult. Now we do our frog experiment. We cover its rotated eye and show it a worm. The tongue goes out and we see that it makes a perfect hit. We repeat the experiment, but this time cover the normal eye. In this case we see that the frog shoots out its tongue with a deviation of exactly 180 degrees ... Each time we repeat the test, it makes the same mistake ... for the animal there is no such thing as up and down, front and back, in reference to an outside world, as it exists for the observer doing the study. There is only an internal correlation between the place where the retina receives a given perturbation and the muscular contractions that move the tongue, the mouth, the neck, and, in fact, the frog’s entire body.

13 Soren Brier, *Cybersemiotics, why information is not enough* (2008), 257.

14 Heinz Von Foerster, *Understanding Understanding*, (2003), 216, 217.

15 Tree of Knowledge, 125, 126.

Epistemological constructivism posits that knowledge is a subjective creation, where an observer's operation is described within its own repertoire of representations and accounts for the constitution of its identity, differentiating itself from the environment, and stating the environmental stimuli to which it will react and the repertoire of actions that will take in light of that stimuli, which allows for the observer's survival.¹⁶ This is the case of any living system.



All this can be related to goal-seeking behavior, which can be of two types: 1) Teleological, where the goal of a system is set by an observer; and 2) teleonomical, where the observer produces its own purpose by interacting with the environment. One example of a teleological or observed system is the afore-mentioned thermostat, which is created by humans to fill a purpose, whereas any animal that adapts to its environment in order to survive partakes in teleonomical behavior and is an observing system.

Humans as observers have a degree of reflexivity that goes beyond the simple self-reference of cognition that is general to all living systems, so they are both teleonomical and teleological, as humans can set their own purpose but have to do so in relation with their interaction with an environment. On the other hand, social systems are a set of two or more subjects that observe each other, that is, they are mutually observing and are also teleonomical and teleological.¹⁷ Human social systems are the tension between the "I" and the "Other".

16 Soren Brier, *Cybersemiotics, why information is not enough* (2008), 182; Francisco J. Varela, Evan Thompson & Eleanor Rosch, *The Embodied Mind. Cognitive Science and Human Experience* (MIT Press, 1993), 172, 173, 174, 176.

17 Roberto Mancilla, *Introduction to Sociocybernetics part 1: Third order cybernetics and a basic framework for society*, *Journal of Sociocybernetics*, Vol 9, No 1/2 (2011) <http://zaguan.unizar.es/ojs/index.php/rc51-jos/article/view/623>; *Introduction to Sociocybernetics part 2: Power, Culture and Institutions*, *Journal of Sociocybernetics*, Vol 10, (2012) <http://zaguan.unizar.es/ojs/index.php/rc51-jos/article/view/625>

The “social system” is a very flexible concept that can comprise different sizes (from dyads, triads and small groups (2–20) to large organizations, cities, States, which range in the thousands or millions) and dimensions, which can reflect a unit’s mobility (think nomadic tribes) or how it is bound up, geographically for instance (like cities or States). Two ways to analyze human social systems will be offered in this study: a subjective and a geographical.

The subjective level of analysis comprises the following elements: individual, small groups, organization, organization set, organization population, organization field and world system. This analysis studies configurations of social systems that are specifically circumscribed to a spatial extension. The geographical level of analysis comprises: community, city, region/federative entity, State, confederacy of States and world-system. Its purpose is to study the spatial structuration of social systems, but it also has a subjective element that is not subject to movement, unlike the levels of the subjective set. It is important to note that although both sets share the world-system element, each analyzes it in different ways: one sees it as the totality of a territory in which human interaction is held and the other as the organizational field in which the totality of human interaction is carried out.

Two scale levels can be derived from these levels of analysis: micro to meso and meso to macro; these however, cannot be determined in a clear-cut way and thus they overlap. Of these levels of analysis, the models of legal behavior will be based on the meso to macro approach, although aspects of the second model can be used on a micro scale. A meso to macro level can be composed geographically of cities of considerable size, regions/federative entities, States, confederacies of States and the world-system, and subjectively by large organizations, organization sets, organization population, organization field and world-system.

III. Informational flow model

Because my point of departure is the idea that information results from cognition as a self-referential computation of representations, Law is information about how formal social organization is carried out and how it ought to be. Examples are found in all sorts of legal materials: legislation, sentencing, administrative regulation, academic texts, customary law, religious texts, legal principles, popular literature and television shows about Law and the legal system, among many others.

I hold that because Law is a construction of human beings, it has no intrinsic nature or concept, rather it is a mirror of human behavior and human nature; Law can then be understood as all the possible configurations of formal social organization, with particular theories comprising only an aspect of it, but never the whole. In every generation, theories of Law appear, all of them possessing some validity. Kagan understands this when he says that “As in the proverb of the blind men and the elephant, different commentators, each attending to one aspect of the law, perceive its social functions differently”.¹⁸

This also means that instead of asking “What is Law?” or “What is the nature of Law?” it is more fruitful to ask “What is the relation of the subject/observer to Law?”.

18 In *Phillipe Nonet and Phillip Selznick, Towards Responsive Law: Law and Society in Transition* (2000).

Law is not only understood as information that resides within an observer, such as his or her understanding of how the social system he finds himself in is or should be organized, or within a group, i.e., the consensus of a part of a social system on how the system is or should be organized; Law can also be an informational state. This is the state of affairs arising from ideas about what constitutes formal social organization that an individual or a group holds at a specific time and place and which they circulate within the social system.¹⁹ It is more than the sum of individual and communal understandings of Law.

In Law, Western society has tried to project its expectations of order and certainty in the form of a deterministic machine that presides over social organization. However, because Law comprises a self-referential and recursive body of rules that apply simultaneously, its own complexity avoids such mechanism.²⁰ Law as an informational state of social organization can be generated by means of two flows of information, which are in constant feedback: an internal one that includes the acceptance or rejection by those who are subjected to it and an external one that comprises collective acceptance or rejection and overall social interaction.²¹

Law (as well as Justice and the Rule of Law) as an informational state is to be studied in a certain timeframe but also circumscribed to a sociological level of analysis, which can be geographical or subjective. The former can be a State, confederation or world-system constitutes; the latter could be a group of people, like lawyers and scholars, who understand themselves to be part of an epistemological project. That is, one can distinguish them between the general cultural system of a geographical social system and between the “legal” cultural system of the same unit of subjective analysis.

It is of utmost importance that when building an epistemological flow model one limits the scope, as different scopes will give different results about what is understood to be Law, Justice and the Rule of Law. Every unit of analysis (from individual outwards) has an internal model of what Law, Justice and the Rule of Law are in order to be able to interact with them; this is what constitutes the informational state.²²

In the informational flow model, concepts of Law, Justice and Rule of Law interact on three levels: 1) as information, 2) as part of a social programming language, and 3) as their implementation. Law on the first level of interaction information has its origins in human activity and can be generated by the two above-mentioned flows. Law is control information because it allows for the coordination of human social systems by establishing procedures that aid in organization. Law must be considered an algorithm(s) of sorts that attempts to solve the following question: Which are the procedures are the appropriate ones for organizing social interaction?

Through legal cognition – the processing of information related to the form of social organization – Law transits from this first level to a second, adopting the syntax of the social programming language. At the same time, this type of cognition gives way to the application of the procedures of social organization that are created by means of a structure made of implementative theories of Law, which are presupposed by those who apply the Law and at the same time generate new information that feeds back to the other levels.

19 The term is taken from: *Javier Livas, Cibernetica, Estado y Derecho* (1988), 205.

20 *Ibid.* at 206.

21 *Ibid.*

22 *Ibid.* at 207, 208, 215.

The generation, application and transmission of legal information together create a chain of circular causal processes that loop from the first to the third level and back again. To this end, it can be concluded that the purpose of any understanding of Law is to order and correlate the experiences of humans as they interact with an environment. Also, the common concepts of social theories are organizing strategies that humans have developed for ordering complex patterns of potential information.

All the levels of the theory of Law communicate with one another by means of legal cognition. Moral and political values are later incorporated into the information and used as strategy to achieve different goals, which may or may not have a political nature. The incorporation of values is the way in which Justice influences Law and interacts with it at three levels: control information, semantics of the social programming language, and Justice as ideology (implementative level).

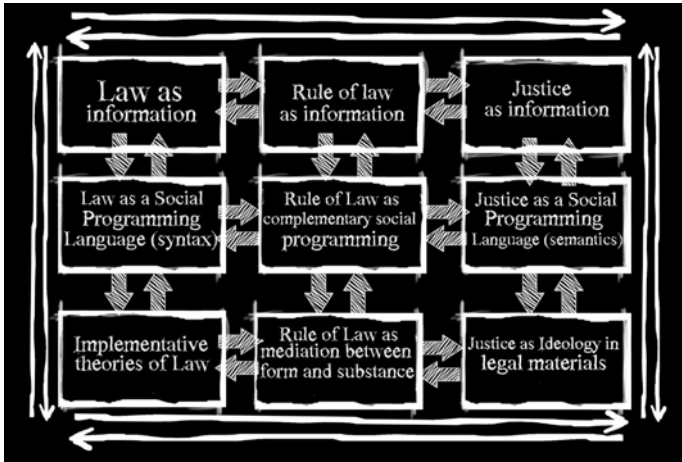
As control information, Justice seeks to answer the question: Which are the values that must permeate social organization? At the social programming level, Law forms the syntax because it establishes the procedures that organize social life, while Justice forms the semantics because it establishes the content of the procedures, that is, the applicable values. Lastly, the ideological aspect of Justice represents the values contained in the different materials used by those who apply Law, and it is the aspect that results in different endeavors to reprogram society and its contents totally or partially.

An important aspect of Western theories of Justice is that they are self-similar: they can be reduced to the idea that Trasymachus expressed in Plato's Republic that Justice is the domain of the strongest.²³ This means that when Law and Justice are joined, the former is transformed by the latter into a game in which the definition of the strongest is subject to change and different factions will attempt to transform that definition to more closely correspond to their values; this is the subject of politics.

The Rule of Law is the viable mediation between Law and Justice, working on the same three levels but with some variations: the first is control information again; the second is complementary social programming, but while Law and Justice make up the social programming language, the Rule of Law functions like a type system, one that verifies the adequacy of the conjunction. In the last tier, it is understood as the mediation of form and substance, that is, the materialization of Justice as ideology and implementative theories of Law. While Law tends to the continued existence and stability of the social system and Justice to its optimization, the Rule of Law tends to the adequacy of the conjunction of both.

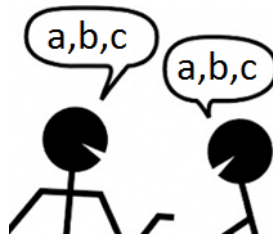
In the informational model, abstract ideas of Law, Justice and Rule of Law have legal cognition updating them by means of the relation between levels, that is, a vertical interaction. At the same, however, time there is an interaction across them and their respective levels, a horizontal interaction. All of this can be expressed as follows:

23 *Plato, Republic* (1992), 14, 15.

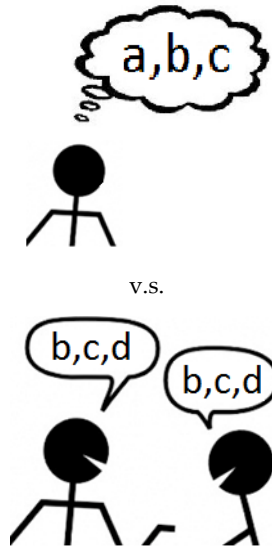


IV. Implementative model

The implementative model of Law comprises several theories of Law and aims to show the way in which Law is manifested in reality. These theories amount to a communication process: The theory of normative order comprises the common signs that enable the exchange of information; a theory of the subjects of Law comprises those who are part of the communication. This is expressed as follows:



An empiricist idea of Law allows us to distinguish the signs used *vis à vis* the way they were intended to be used.



The normative order model is the main component of the implementation, as the subjects of Law have to be mentioned by a norm to have that character and the “law in books” is to be found within existing legal materials. Norms enable legal cognition and communication and can be defined as a project of reality, that is, a hypothetical to which the existing social reality is meant to be molded. At the same time, because they are manifested in reality, norms form part of reality and thus by their very existence affect social reality.

A normative order is a system of norms – which can be contradictory – that attempts to mold social reality to its mandates. To this purpose it is constantly applied, which results in its interpretation and sometimes its modification in order to adapt to changes in circumstances. The elements of the normative order are the following: 1) a legal norm, 2) its application, and 3) the resulting interpretation, amendment or informal change that results from it which in turn feeds back to and changes the norm itself. The normative order is both static and dynamic: it is both a repository of data (legal norms) and the process in which they change (application, interpretation, amendment and informal change).

Classical positions on the legal norm state that it comprises two elements: a legal hypothesis and a factual situation that when fulfilling the hypothesis brings forth a legal consequence. These norms are organized in a strict hierarchical relation to one another in which a higher norm determines the validity of a lower norm and ultimately the highest norm rest upon a presupposition of validity (Kelsen’s *Grundnorm* or Hart’s rule of recognition). Furthermore, in these conceptions, norms state only duties, that is, what “ought to be” and have the following formula “If A, then B”.²⁴

24 Hans Kelsen, *General Theory of Norms* (1990), XXXII, XXXVIII, 1.

This type of conception does not take into account many aspects that Law and Society has understood to be important: 1) The norm is understood in abstract terms as a hypothetical mandate, whereas it should also be accounted for an aspect of reality for once a norm is published – its very existence an enticement to its receivers to take measures in embracing or rejecting its content. 2) Conventionalisms, morals and social rules can affect the implementation of norms and legal formalism minimizes or ignores this influence. 3) The receivers of the norms usually create a narrative of compliance which can be approved by the authorities (legal endogeneity).²⁵

Taking this into account, my idea of the legal norm comprises two elements: 1) endonorm: the core of the norm, which is constituted by legal hypothesis and consequence; 2) perinorm: sociological aspects of the norm to be found in the conventionalisms and social rules that surround such norms and their application as well as the morals that surround their application and acceptance, thereby determining the norm's validity.

As projects of reality, norms can have three different types of content:

1) When rules norm behavior directly, they can be deontic – stated with the phrase “ought to” – and are subject to the possibility of violation. They can be expressed by means of this formula: “If A, then ought to be B”. An example of it can be: “If robbery is committed, then the sanction ought to be ...”.²⁶

2) Technical-conventional rules have to be necessarily observed in order for any action to be considered as legal. These are stated with the phrase “have to”, as in: “For A, do B”. An example of this type of norms could be found in the issuance of a valid document, like a passport: “For obtaining a passport, one has to comply with the following requirements ...”.²⁷

3) Ontic rules, expressed with “is”, state the existence of elements of the legal system, which are then upheld by the beliefs of all the people that constitute society. These rules can be stated as “X counts as Y in context C”, as in „a full house counts as the third highest hand in the context of a poker game.”²⁸

Moving on, in the case of deontic norms, when a fact fits within the normative hypothesis and the legal consequence is sought, one turns to legal application, which in its most basic form implies a voluntary or a compulsory compliance with the Law by the subjects of Law who can be part of a geographically established entity (like the State) or individuals or associations whose existence does not generate a geographical demarcation with rules of its own.

When the norm is applied its scope must be interpreted. Interpretation is a construction of the meaning of the norm; however, when interpretation is insufficient, there can be a mutation or informal change (that is, a change that is outside an amendment procedure). In this case there is a normative reconstruction that allows for the incorporation of new meanings to the norm.²⁹ All of this can be expressed in the following schema:

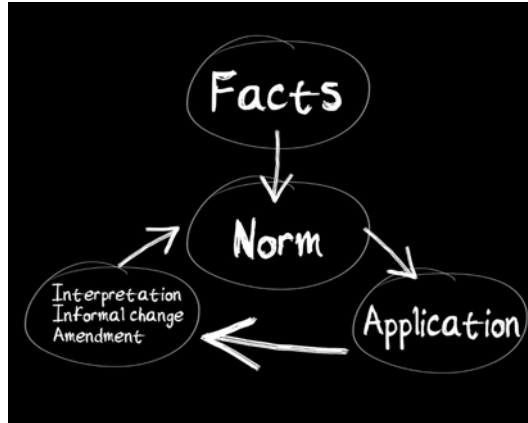
25 Lauren B. Edelman, Christopher Uggen & Howard S. Erlanger, *The Endogeneity of Legal Regulation: Grievance Procedures as Rational Myth*, *American Journal of Sociology*, vol 5, No 2 (1999), 406–454.

26 Kelsen, *supra* note 24 at XXXII, XXXVIII, 1.

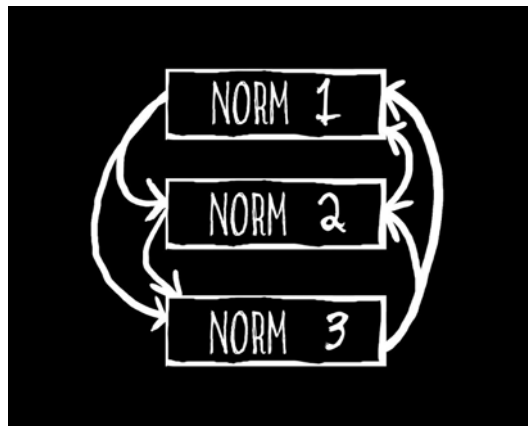
27 Gregorio Robles, *Las reglas del Derecho y las reglas de los Juegos. Ensayo de Teoría analítica del Derecho* (1982), 41.

28 *Ibid.*

29 Pablo Raul Bonorino (ed.), *El Derecho en Accion. Ensayos sobre interpretación y aplicación del Derecho*, (ARA Editores, 2010), 257, 263; Franco Mondugno, *Teoria de la Interpretacion Juridica* (Querétaro, México, 2004), 18.

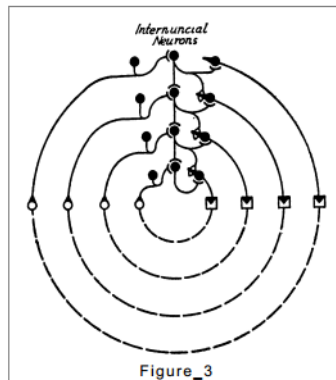


Having stated the circular process in which application takes place, which results in interpretation and informal change of legal norms, it is important to state the relation that diverse norms hold in relation to one another. Norms are not organized in a strict linear relation between superior and inferior norms but as a chain of circular causal processes where there is mutual influence. Van Hoecke describes: „Circularity means that the higher norms within the hierarchy of a legal system not only determine the lower ones, but also, in turn are determined by these“.³⁰ This can be expressed as follows:



30 Mark Van Hoecke, *Law as Communication*, (Hart Publishing, 2002), 37, 38.

I am compelled to say that the idea of normative hierarchy entails an illusion of strict structure, whereas in reality, legal norms relate to one another in a heterarchy, much in the same way that the informational model functions. A heterarchy is a form of organization, where there are no hierarchies and the elements can be ordered in differing ways, according to circumstances; the precise definition varies across fields, but the term was created by cybernetic and cognitive science pioneer Walter McCulloch in his 1945 paper “A heterarchy of values determined by a topology of nervous nets”, in which he demonstrated that the human brain was not organized in a hierarchical way. This is an example of the neural circuits he refers to as being heterarchical.³¹



In a legal heterarchy, higher-order norms relate to their inferiors by conditioning the existence of the lower norms by stating (by means of the content) the rules and policies that cannot be contradicted or surpassed and by having instruments and procedures that can nullify the inferior. Lower-order norms relate to their superior by enacting and expanding their content by means of their own, as van Hoecke said. Lower norms can nevertheless be used to expand the content of the higher norm beyond the intended scope; they can even modify the superior norms informally -that is, without an amendment process- despite the existence of instruments that can be used to declare lower norms illegal or unconstitutional. Until said instruments are invoked and used, the lower norm effectively modifies the superior.

Regarding the subjects of Law, social systems can manifest as information processors in massive communication; that is, the persons, who comprise a social system communicate with one another on an individual level and also joined in different corporate forms that overlap. In my theory I state that the distinction between public and private is insufficient to state the complexity of current social relations, and thus I propose two types of legal persons: mobile and geographic. The latter are those that have dominion over a geographic extension and which generate the rules to govern the extension, while the former are the individuals or association of individuals that can perform different activities through geographical extension and that do not generate territorial rules.

31 Warren. S. McCulloch, A heterarchy of values determined by the topology of nervous nets. http://vordenker.de/ggphilosophy/mcculloch_heterarchy.pdf

V. *Usefulness and novelty of this study*

A. *Examples*

In practice, the epistemological flow model can be used to keep track of the existing scholarly work and information circulating within a geographical territory and its legal system. The usefulness of this consists in that one can determine the stability of a system when the flow of information matches to the values and procedures that are already nested in the law; change, on the other hand, might take place when there is a divergence between circulating information and that which is consolidated in legal materials. It can also help trace change by means of tracking the information that influences the system over time.

The legal and political panorama of Mexico in the twentieth century can exemplify the information flow model very well. The country was dominated by the Institutional Revolutionary Party (PRI), which was founded in 1929 by Plutarco Elías Calles (president 1924–1928) as the National Revolutionary Party (PNR) to represent the forces that had triumphed in the Mexican Revolution, and to give stability to the country by means of the institutionalization of the agreements made by them. This organization determined the goals and direction of the Mexican State continuously for over 70 years, until the presidency was lost in 2000. The leaning of the party was considered to be center-left until the 1980s, where it shifted markedly to the right.³²

From the 1940s to the 1970s, the country experienced a period of economic growth and stability known as *el Milagro Mexicano* (the Mexican Miracle) with sporadic periods of intense political unrest, such as the student massacre of 1968. In this period, Mexico was governed by PRI presidents who were elected with more than 74 % of the vote and were named by the president in power. The party also controlled the 64-seat Senate, and 80 to 90 % of the 300-seat Chamber of Deputies, which meant that the policy sent by the president was approved most of the time.³³

During this period one can see a strong constitutional review, European influence and socialist legislation with State intervention. This permeates on all three levels: the top level states what scholarship is influential and circulates on to the rest of the system; the middle one entails the approach taken by the legislation and the third one, the overall type of theoretical system, ideology that informs the latter and their conjunction. Mexico from the 1920s to the 1950s was a stable system because there was a sameness in the content of circulating scholarship, contained by the normative order.

32 *Congressional Research Service*. Mexico's Political History: From Revolution to Alternation, 1910–2006; <https://www.hdsl.org/?view&did=459875>

33 *Ibid.*

Mexico (1920-1950)			
	Law	Rule of Law	Justice
Control information	German Law (legal theory) French Law (civil and administrative law) U.S. Constitutionalism	Emphasis on constitutional litigation in order to right social wrongs (Amparo suit)	Karl Marx Socialist writers
Social programming language	German Law (legal theory) French Law (civil and administrative law) U.S. Constitutionalism	Emphasis on constitutional litigation in order to right social wrongs (Amparo suit)	Socialism and State intervention
Ideology and theories of Law	Kelsenian normativism	Static normative system with social content Strong constitutionalism	Socialism and State intervention

From 1980 to the present, Mexico underwent significant changes in economic and electoral policy: shifting towards free market policies and adding another 100 seats to the Chamber of Deputies in 1986, with 200 of the 500 seats being distributed among the smaller parties on the basis of proportional representation. This laid the basis for increasingly democratic and plural elections, which peaked in the mid-term legislative elections of 1997, where the PRI lost the majority in the Chamber of Deputies and its two-thirds majority in the Senate, and it lost the first election for the mayor of Mexico City.³⁴

Furthermore, in the 2000 election opposition candidate Vicente Fox of the Alliance for Change (PAN and Green Ecological Party of Mexico) was elected President, thus ending the PRI's 71 years of control of the presidency.³⁵ In 2006, PAN president Felipe Calderón made the battle against organized crime the centerpiece of his tenure, which has resulted in over 60,000 dead and over 20,000 disappeared; this has led to a general discontent, even by those that initially supported his measures. This unpopularity brought an opportunity, which was seized by the PRI and led them to regain the Presidency with the election of Enrique Peña Nieto.

³⁴ *Ibid.*

³⁵ *Ibid.*

In the second case, there is a shift from the socialist, strongly constitutionalist normative order to one that is more about the idea of human rights rather than constitutional ones, keen on deregulating and establishing a free market rather than having State intervention and strongly implemented social rights. In this case, there is a difference between the content of the legal system with that of existing doctrine, and there is not only the possibility of change but actual change, which can be tracked through time once one accounts for the history of the period in question.

Mexico (1980-2010)			
	Law	Rule of Law	Justice
Control information	Varied European authors U.S. legal scholarship Human rights law	Emphasis on the application of human rights treaties on the national legal system (control de la convencionalidad) Administrative deregulation	Human rights literature John Rawls Assorted socialist writers
Social programming language	Varied European authors U.S. legal scholarship Human rights law	Emphasis on the application of human rights treaties on the national legal system (control de la convencionalidad) Administrative deregulation	Human rights literature John Rawls Assorted socialist writers
Ideology and theories	Assorted positivism and human rights	Derregulated administrative law Application of human rights treaties over national law but on par with the Constitution Constitutionalism tempered by international human rights law	Neoliberalism and Free market thought

To exemplify the workings of the normative order model, let me start with a well-known joke among Mexican lawyers: Moses is giving God’s commandments to the Jewish people and as he states them one by one he is increasingly being booed by the crowd. As he gives the last one to the people, whom are on the verge of rioting, he tells them: “Settle down lads, settle down, we will see what the courts have to say about this”. No single law is immutable or infallible, all of them are subject to interpretation.

Let's take the following 3 commandments as an example and see how they might develop as a system:

- Thou shalt not kill.
- Thou shalt not steal.
- Thou shalt not covet.

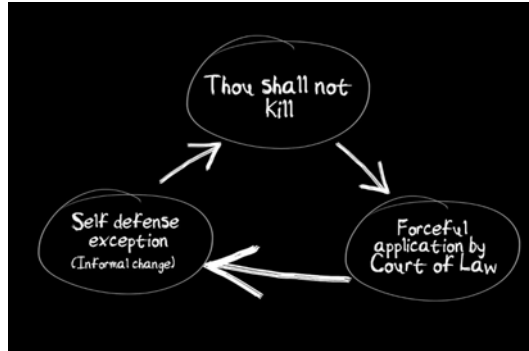
In criminal legislations all over the world, there are numerous exceptions to the prohibition of stealing and murdering. And while the prohibition of coveting regards rather morality than crime, for the sake of having fun, let's say that if you can prove it: coveting can be considered a tentative of theft and thus is punishable. Let's see what the courts have to say about this.

Let's imagine that courts found as exceptions to killing in self-defense and to safeguard others, and stealing for need, i.e., when facing hunger or sickness that endangers one's life and not having the resources to prevent one's own death. Meanwhile they also found that coveting – be it lusting after someone or envying a good or object in possession of someone else – is not tenable as a crime, instead it remains a moral guideline. The three commandments would look like this:

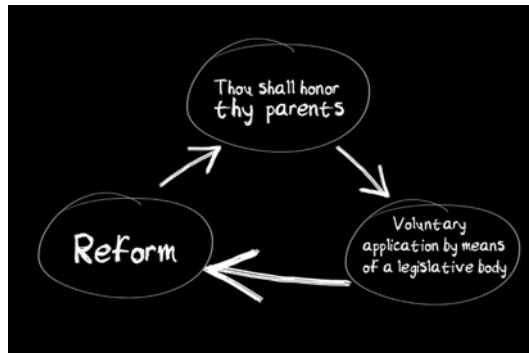
- Thou shalt not kill.
 - Except in self-defense
 - Except to save others
- Thou shalt not steal.
 - Except in hunger and sickness that endangers one's life while lacking resources.

And the process of application could be exemplified as follows:





Let's say that another commandment, „Honor thy father and thy mother“, is enacted into the legal system; the amending process can be shown as follows:



Let's say that this new commandment also has a couple of exceptions: Let's say that someone's father beats his wife and the son or daughter. So in honoring the mother, her life and well-being, that someone injures or kills the father, and the courts do sanction this behavior. The legal system would be comprised as follows:

- Honor thy father and mother.
 - Except to safeguard the life or well-being of one from the other
- Thou shalt not kill.
 - Except in self-defense
 - Except in saving others
- Thou shalt not steal.
 - Except in hunger and sickness that endangers one's life while lacking resources.

To complicate matters further, let's imagine that "Thou shalt not steal" is a mandate made from regular laws, while the other two are part of the Constitution, which is the supreme Law of the land:

1. Thou shalt not kill.
2. Honor thy father and mother.
3. Thou shalt not steal.

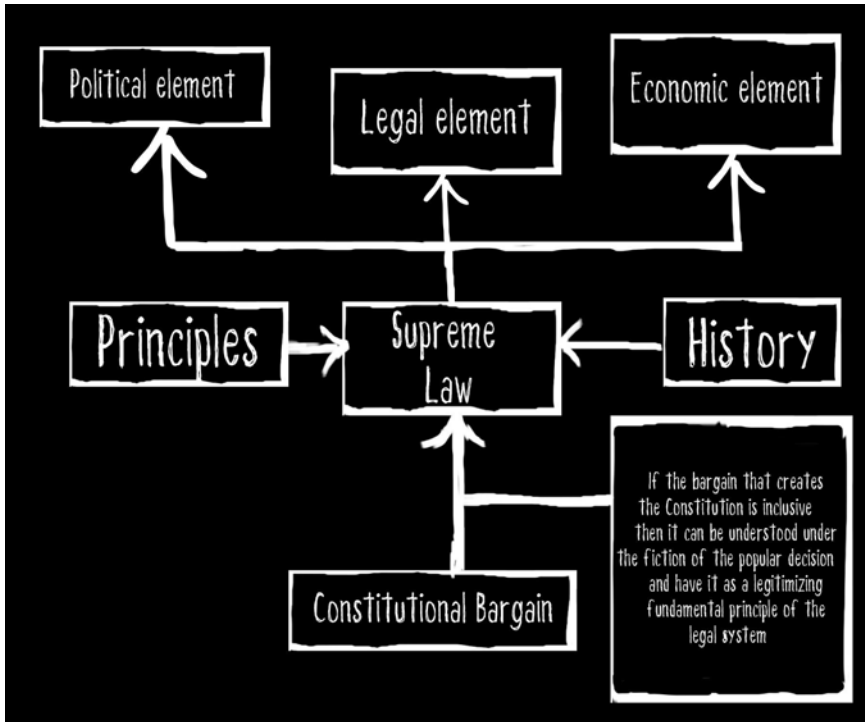
When interpreting laws that have the same hierarchy, sometimes the circumstances favor the interpretation of the principles that one has over those of others, but that does not mean that in general, one is above the other, only for that specific context. Returning to the case where one kills the father who beats the mother in her defence, hierarchy could be as follows:

1.
 - a) Honor thy father and mother.
 - b) Thou shalt not kill.
2. Thou shalt not steal.

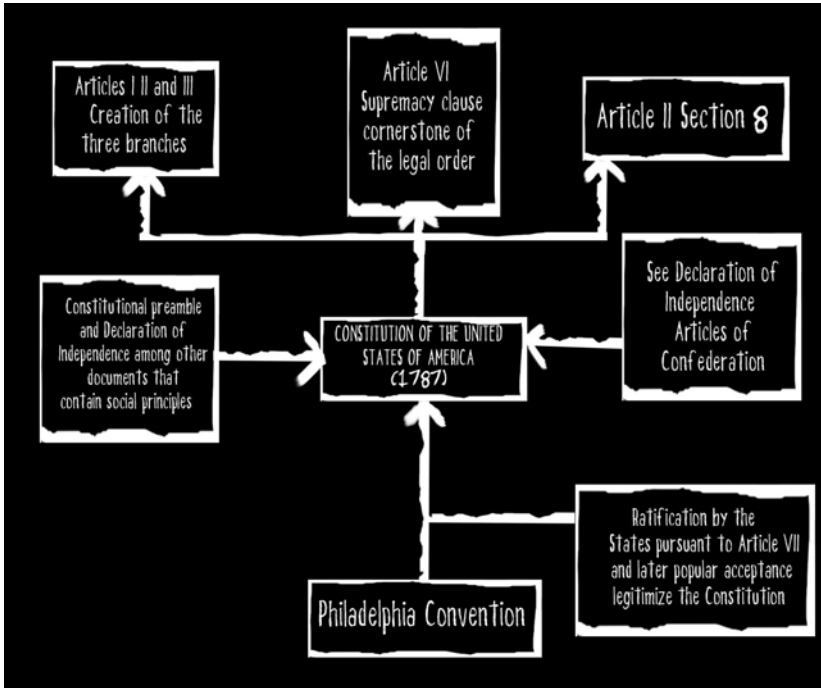
This is a simplification of legal systems, but their essential dynamic is comprised in these examples, where a linear hierarchy can be easily seen. In more complex legal systems, there is a circularity in which higher laws determine the content of lower laws, the latter being illegal or unconstitutional when they violate the content of the former, but also in which the higher law is useless if there are not lower laws to implement them.

I want to make a second example related to how a larger legal system would be structured. I won't go in detail on the application aspects as much, instead I will focus on how it is organized on the first place. To do so, I will use a model of a Constitution as a self-referential law that comprises economic, historical, sociological, legal and political aspects within a polity and that has a definite hierarchy and is subject to application and implementation.

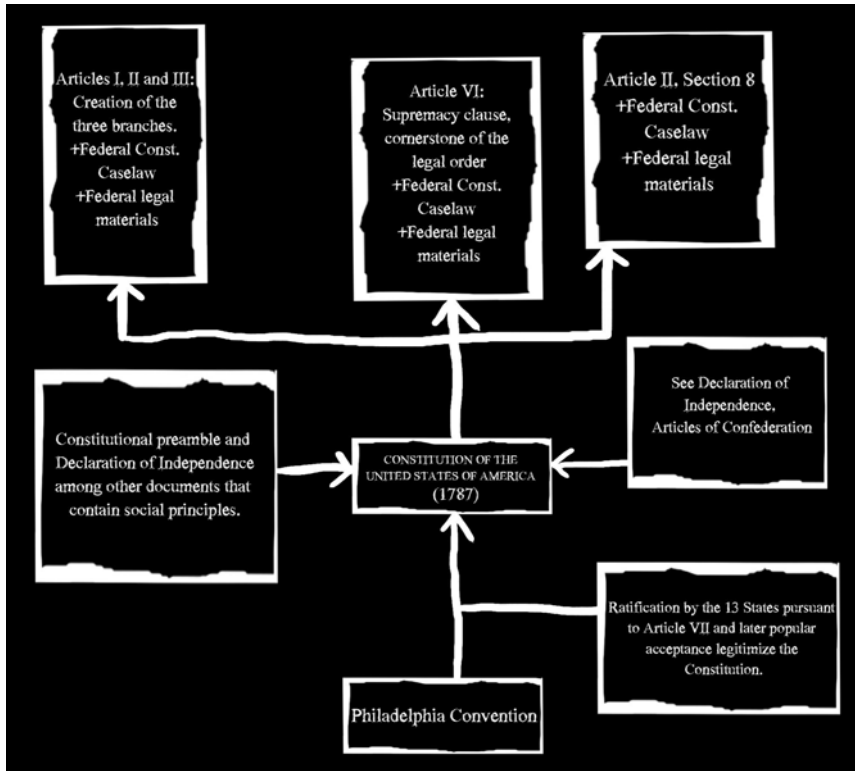
I will make the simplest of correlations of this model with the text of the United States Constitution, as anything more complex would require a chapter or even a book. The basic model is as follows:



The correlation of the model with the U.S. Constitution would yield something like this:



Not wanting to yield a too static example, I will state in the following schema the way in which other sources of law in the U.S. relate to the Constitution; however, this will be just a mention and not a correlation with a specific legal material or case, as there are too many to make a basic correlation like I did with the articles of the Constitution. To do this, I will bold the added material once you take into account legal application and then I will specify the different types of sources in the U.S. and the hierarchy that they have.



The federal case law that I state in the correlation is the one that interprets the Constitution. This distinction is important because in the U.S., case law interpreting enacted law holds the same hierarchy as the law it interprets. Thusly, federal case law that interprets the Constitution is an extension of the latter.³⁶

In the United States, the sources of Law are the following: Legislation (State & Federal), which comprises the Federal and State Constitutions, statutes, treaties, court ruling and administrative agency rules; case law (State & Federal), which can be judicial (common law case law and that which interprets enacted legislation) and administrative (agency decisions); lastly, secondary authorities are also source.

36 Allison Conelly, *The Sources of Law*, University of Kentucky Law http://www.law.uky.edu/files/docs/clinic/sources_of_the_law.pdf

Taking into account the case law that interprets and informally changes enacted law as part of it, the hierarchy of the sources of the U.S. legal system are as follows:³⁷

1. U.S. Constitution
2. Federal statutes, treaties, and court rules
3. Federal administrative agency rules
4. Federal common law case law
5. State constitutions
6. State statutes and court rules
7. State agency rules
8. State common law case law
9. Secondary authorities

The importance of the Law and Society tradition in this model and the way the former complements the latter resides in the fact that empirical studies can be used to see the real impact that the diverse legal materials have on social reality, in order to ensure a clearer picture. With all this data in mind, one could correlate all the empirical studies and legal materials on the basis of application (what material interprets/informally changes/amends others) and the hierarchy that they have (higher/lower), and after undertaking such a massive endeavor, one could visualize it in different ways – from a pyramid that denotes hierarchy to a network schema of sources or a network of legal organs that partake in the system. This would simplify and improve access to legal materials and the way one could study them as a system, allowing practitioners to complement the scope of their specialization and their experience.

If to this model one adds the informational flow model of Law, Justice and Rule of Law, one could see if the ideology and theories that circulate among practitioners and scholars converges into or diverges away from that which impregnates the existing legal materials and thus determines if there is a movement towards change or stability within the system.

B. On the idoneity of the models

The models of Law that I have developed in this paper are more thorough and comprehensive than previous approaches. Theories of Law vary in their content as different authors emphasize specific aspects: Kelsen and Hart focused on the norm and the normative system in a static way; Raz, Weinberger and McCormick made reformulations of their own; Dworkin focuses on interpretation but presupposes normativism; Luhmann and Teubner have a theory of legal systems but neglect norms; and Robles has one of legal dynamics (Law as a game) that presupposes bits and pieces of all the latter.

My approach is composite in nature, within it I state different sub-theories that encompass reformulations of the latter theories and also innovations and departures: I state a theory of the norm in which there are ontic, technical and deontic rules that are manifested through a fact and are subject to application and acceptance from the social reality they attempt to modify and bring forth; thus, norms have a core consisting of a hypothesis and a consequence and a periphery, which comprises morality and social custom.

³⁷ *Ibid.*

Norms are then applied – a novel aspect I bring forth – coercively or voluntarily, by a mobile or a geographically based person and result in an amendment, interpretation or informal change, which then feeds back into the norm and becomes part of it – all of this within the dynamic of a game. I innovate on normativism because I make a more fluid or dynamic iteration, I briefly propose an understanding of legal subjects of my own by breaking from the public/private distinction and focusing of geographical location and mobility; I also construct a theory of epistemological flow within Law, Justice and Rule of Law, which constitutes the foundation for the interplay of all these theories.

My overall theory and my models adhere to William Twining’s program of adapting legal philosophy and jurisprudence to globalization. Twining’s central idea is that most processes of globalization take place at scales and levels of analysis not considered by the Western cannon of jurisprudence, thus dismissing important levels of social relations and their normative and legal ordering. He calls for a critical revision of the mainstream to take more account of “other legal traditions and cultures, and of problems of conceptualization, comparison, generalization and critique about legal phenomena in the world as a whole” in order to achieve a “healthy discipline”.³⁸

Twining also notes certain tendencies and biases in Western academic legal culture: for one, that Law consists either of State or International Law; second, that Nation-states, societies, and legal systems are closed, self-contained entities that can be studied in isolation; third, Law is best understood through ‘top-down’ perspectives, such as rulers, officials, legislators, and elites; that the main subject-matters of the discipline of law are ideas and norms rather than the empirical study of social facts; and lastly, that the fundamental values underlying modern law are universal, although the philosophical foundations are diverse.³⁹

In the development of the meso to macro aspects of my theory, I focus on contrasting the presuppositions that underlie many Western legal theories – linear thinking, reductionism and single-track thinking – with ideas like cyclical causation, holism, causal loops and others. In making these normally hidden features visible, I incur in an indirect critique of Western thought, as I try to give a different viewpoint by means of the usage of disciplines like cybernetics, complexity, systems thinking and semiotics to overcome these deficiencies. Although I apply these models to the State and to medium to large social systems, they are also fit for mapping legal behavior at smaller scales, as it was the example of the application of my normative order model to the Ten Commandments.

Furthermore, Law does not exist in isolation; rather, it is part of a larger network of activities that take place in social systems. In understanding social systems, I try to attend to their very basic root: communication and biology. I thus try to extend my theories in a way that basic communication processes common to all cultures and traditions can be used to visualize and map the structures of social organization, not only Law. However, I specialize on Western systems because I was shaped by their legal traditions and these are the main subject of my critiques, as I address the notion of ego and games.

38 *William Twining*, *General Jurisprudence. Understanding Law from a Global Perspective* (2009), XI.

39 *Ibid.* at 5, 6.

The world has always been connected, but nowadays it is becoming ever more so and in a way that was never seen before, much like a neural system; scholars, practitioners, politicians, decision-makers of all kinds and others agree on this but debate the degree and the speed at which this process is taking place. However, not much attention is paid to the fact that all the component parts of the world (so to speak) have different languages, schools of thought, philosophies, methods and understandings of the world that may not coincide and which may cause misunderstandings and slow communication.

This sample of my theory of Law and its underlying basis of cybernetics, semiotics, complexity and systems thinking strive to provide a common language and understanding of things, so that meaningful coordination and action can take place. Rather than offering an all-encompassing theory, all I intend to do is offer a flexible and useful set of tools that can be used on different systems and circumstances.

In short, my models can help scholars understand and analyze socio-legal problems in a more insightful way than what has already been accomplished, because this way is broader and uses circular causal processes, self-reference and recursion, which center on knowing the behavior of a system rather than all of its components. This makes it akin to computer systems, and because of these features, I hold that it is subject to modeling.

VI. Conclusion: Law and Society and legal informatics. A marriage proposal

Theory and practice have a complementary relation: The former helps to give coherence to a body of practices by describing their interaction in a more detached way, which helps avoid conflict between perspectives that arises from the relative nature of each position, while the latter informs the content, method and limitations of the former. This is the same case for my meso-macro models of Law and the Law and Society tradition.

On the one hand, these models of Law, with their usage of circular causation, self-reference and other concepts can give an inkling of a new perspective to practitioners of this movement of how social systems work in general. The theory can also convey a model of Law that can be applied to practice by means of the correlation of the tracking of how information about Law, Justice and the Rule of Law flows in a social system. It also works for the legal materials by means of hierarchy and the way the materials modify each other, with an eye to the contrast between an ideal and the existing reality to determine the measure of normative application and of implementation of values.

These models are not only abstract heuristic schemas; rather, they can help one see a macro-level perspective of legal systems when one correlates them with legal information. One can see if it is stable or enduring change by studying the information that flows from it. All of this constitutes a single model of Law within a geographical extension, which if enacted, can help practitioners to have the most complete picture of Law possible. This can ensure more precision in the practice of empirical studies.

On the other side, the Law and Society tradition is the pivotal element that helps to bring this schema to practice: by means of it, one can determine the flow of information, perfect the correlation of legal materials and carry on with the diagnosis of the legal system by determining the existing reality, which is later contrasted with an ideal.