Designing a Transdisciplinary Legal Curriculum Tailored to Fuse Social, Technological and Ethical Considerations. Elevating the Voice of International Law

Abstract: This research deals lucidly and objectively with the possibility of applying the epistemological practice of transdisciplinarity to the science of law, as well as developing a transdisciplinary curriculum in law. To this end, it first presents some characteristics of transdisciplinary thinking, highlighting the complexity and development of transdisciplinary research (as compared to disciplinary, interdisciplinary and multidisciplinary research), which can be more easily addressed in law. It then presents Thomas Kuhn’s thoughts on the evolution of the sciences, highlighting scientific revolutions, the process by which one paradigm succeeds another ─ a model that inspires the idea of transdisciplinarity in law. All this is accompanied by numerous examples. He also analyzes some national regulations in Brazil and Romania, such as Resolution CNE/CES No. 5 and Resolution No. 75 of the National Council of Justice, identifying the forums of transdisciplinarity in the provisions of these documents (which set guidelines for law). Finally, it identifies legal positivism as a paradigm of legal science and presents some of its limitations in the face of transdisciplinarity and the evolution of social phenomena (characterising its crisis), giving the example of international law, in which context it is proposed to challenge the transdisciplinarity of law.

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1. Introduction

‘Rigour, openness and tolerance are fundamental characteristics of the transdisciplinary attitude and vision. Rigour in argumentation that takes into account all the data is the best against possible deviations. Openness implies acceptance of the unknown, the unforeseen and the unpredictable. And tolerance means recognising the right to ideas and truths contrary to one’s own1.’

The epistemological practice of transdisciplinarity is increasingly extending to the various scientific specialties, which are questioning their epistemological premises and attempting to establish relations – albeit timidly – with the pillars of transdisciplinarity. More and more studies are appearing that apply the same main key to a multitude of disciplines with the common aim of opening up and connecting the fields of one speciality with all the others by understanding their boundaries from a complex perspective2.

You can find studies on various topics – pedagogy, health sciences, administration, human rights – all under the aegis of a transdisciplinary vision and attitude, as if scientists from different, hitherto incommunicable fields were beginning to speak the same language.

1 Article 14 of the Charter of Transdisciplinarity, adopted at the First World Congress on Transdisciplinarity, Convento da Arrábida, Portugal, 2–6 November 1994. This document, drafted by the greatest thinkers of the contemporary world, paved the way for numerous studies that have made a huge contribution to the evolution of scientific research worldwide.

In this context, the Transdisciplinarity Charter\(^3\) can be considered an important milestone, as it represents a synthesis of the reflections of thinkers who have dedicated themselves to thinking about science and the world from the perspective of transdisciplinarity, providing the first guidelines from which to promote awareness of the complexity of the world. To this end, science plays a central role, as it is science that has for centuries called for the right to speak about the world with a greater degree of precision. But the method of understanding the world proposed by transdisciplinarity requires a paradigm shift.

Since the Charter of Transdisciplinarity is a substratum for various reflections, its few lines are like the tip of an iceberg (a synthesis), which has surfaced and shown itself to the world only because it has a huge submerged base supporting it. As a corollary, the provisions of the Charter for Transdisciplinarity — though clear, pointed and objective — must be contextualized within the paradigm shared by the thinkers who signed it in order to understand the reflections on science and the world that gave rise to it. Otherwise, it would be a reductionist interpretation of a perspective that is complex par excellence. Therefore, in order to raise the level of understanding of transdisciplinary proposals, it is essential to think about them in the context from which they emerge. This is the purpose for which I have given the example of international law, itself transdisciplinary in nature.

In this line of reasoning, the context of the Transdisciplinarity Charter is the thinking of all those who participated in the Arrabita Conference in Portugal, especially its rapporteurs: Lima de Freitas, Edgar Morin and Basarab Nicolescu. Therefore, the mens legis\(^4\) of the articles of the Charter (as well as other documents resulting from similar events), needs this contextualization, from which a hermeneutic of the Charter can be made, extracting reflections that help to think about the Science of Law in the light of Transdisciplinarity, and the aim of this research is to build such a rationale. For this approach, not by chance, the example of international law appears developed in this study. International law plays a leading role in finding the most effective solutions. In terms of transdisciplinarity in law, when we look at the human being (the natural person) through the prism of his dignity and nationality, it can indeed be said that ‘the recognition by international law of this double belonging – to a nation and to the Earth – is one of the aims of transdisciplinary research’\(^5\).

These reflections are structured as follows: first, the general lines of transdisciplinarity are presented from a predominantly epistemological perspective, developing and organizing elements of the transdisciplinary method for science.

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5 Article 8 of the Charter.
Then, based on Thomas Kuhn’s thought, it will be analysed in what sense transdisciplinarity can be said to be proposed as a new *paradigm* and what is necessary to apply it to legal science and legal education. Our discourse creates a new space, touching on details that can contribute to changes in the law curriculum and to the establishment of an international transdisciplinarity department with several chairs, including for law.

Finally, the last point of this research aims to link transdisciplinary thinking with the science of law, in dialectic with the proposals developed in the previous topics, making considerations about the possibility of overcoming the current paradigm of law in order for it to become transdisciplinary. Some dynamics of international law are presented as examples.

### 2. Transdisciplinary Guidelines

In order to build a bridge between the transdisciplinary perspective and the science of law, with implications for its teaching and methodology, this first moment will address the proposal of transdisciplinarity.

Since it is a very broad perspective, with infinite possibilities for development due to its openness, it is essential to make a methodological choice to delimit (but not close) which aspects of transdisciplinarity will be addressed. However, even if the points of transdisciplinarity to be addressed are delineated, its main purpose cannot be overshadowed and must be emphasised. For Nicolescu, the purpose of Transdisciplinarity ‘is the understanding of the present world, for which one of the imperatives is the unity of knowledge’. And to achieve this goal, Nicolescu also points to ‘three pillars of transdisciplinarity – the levels of Reality, the logic of the third included and complexity – [which] determine the methodology of transdisciplinary research.

The first two pillars, the idea of levels of reality and the logic of the third included, are mainly drawn from recent discoveries in physics and are more evident in this area. The third pillar, complexity, which also has its foundations in physics, transcends this discipline and is used to a greater extent in various sciences. According to Morin, it can be observed in all sciences, given a polysystemic structure in which all things are connected, directly or indirectly, to all others.

In complexity there is initially a closer contact with law, and the link

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6 Despite proposing approaches that explore cross-cultural and trans-religious perspectives, for example, in an attempt to understand the world, the focus of this research will be epistemological. The reason for this choice is logical, as the formation of the transdisciplinary view that is used to analyse meta-scientific issues (such as culture, the relationship between religions, social, economic and political issues, etc.) necessarily involves the epistemological prism. The formation of a transdisciplinary view of a particular problem in a particular discipline depends on its epistemological basis (considerations that will become clearer in section 3).

between law and complexity — as a starting point for building a bridge with transdisciplinarity — is less obscure than the first two pillars. There is no denying the possibility that law is linked to all three pillars proposed by Nicolescu, but as a first approach, the link between law and complexity is more obvious. And from this initial link, reflections can be drawn. For the particular advancement of international law, the link with all three pillars will be as close as it is useful, as we will detail below.

Professor Basarab Nicolescu arrived at the application of the following three axioms of transdisciplinarity methodology, which, if applied even to international law research, would lead to more concrete results: 1) the ontological axiom: there are, in Nature and in our knowledge of Nature, different levels of Object Reality and, correspondingly, different levels of Subject Reality; 2) the logical axiom: the transition from one level of Reality to another is ensured by the logic of the included third party; and 3) the epistemological axiom: the structure of the totality of the levels of Reality is a complex structure: each level is what it is because all levels exist at the same time.8

Abstracting for demonstrative purposes the relevant theory as it relates to international law, we begin the exercise by presenting the logic of the included third party (or trivalent logic) as a formal system of logic whereby three truth values are admitted: true, false and indeterminate. This logic has been developed for situations where statements cannot be proven true or false with certainty. The apparent difficulty of the exercise is ultimately useful in that, by materialising the establishment and use of formulas such as those to be presented, subjects of public international law will find solutions in a more rapid and objective way.

In classical binary logic, every statement can be classified as true or false. In contrast, in the logic of the included third party, there is also a third, indeterminate truth value, which reflects situations where statements are ambiguous or incomplete. For example, the statement ‘There is peace in the world’ can be true or false, depending on the exact perception of the subjects, but it can also be indeterminate if the state of peace is in the range between calm and unrest. In this framework, the logic of the included third party can be considered an important tool in solving transdisciplinary problems that are characterized by ambiguity, uncertainty and complexity. By admitting a third truth value, the logic of the included third party can shape a more flexible framework of thinking and leads to the development of solutions that take into account a multitude of perspectives and variables.

The logic of the included third party can be received in international law in various ways, particularly in relation to international conflict resolution and

treaty interpretation (for situations where the paths and interests at stake are different and cannot be reconciled through a binary approach based on true or false). By valuing a third, indeterminate truth value, the logic of the included third party has the potential to identify new compromise solutions as well as finding possibilities for avoiding conflict escalation\(^9\). More concretely, in international conflict resolution, the logic of the included third party can be used in mediation or arbitration to identify compromise solutions, why not?

For example, if two states are involved in a territorial conflict, the logic of the included third party may be operative in identifying solutions that take into account the interests and perspectives of both parties, such as the division of territory or the development of a regime of autonomy. It is interesting how the application of the logic of the included third party in international law overcomes the limitations of dualistic thinking.

The ontological axiom that there are, in nature and in our knowledge of nature, different levels of object reality and correspondingly different levels of subject reality can be applied in public international law by understanding that international society is made up of a diversity of actors, with different interests, origins, perspectives and capacities, and that this diversity must be taken into account in the process of drafting and applying international law by recognizing the existence of several levels of object reality, such as: The physical level, the biological level, the social level, the cultural level, the economic level and the political level, as is often the case in human rights. Each level of reality can influence the way in which international problems, whether simple or complex, are perceived and dealt with, and can have a bearing on the way in which the rules and norms of international law are developed and applied.

In terms of levels of subject matter reality, the use of this axiom can lead to the recognition that there are different levels of power and influence in what we call the ‘world order’, and these levels will be taken into account in the process of developing and applying international law because powerful states and international organisations may have a greater influence on the development and practice of international law compared to smaller states or civil groups, for example.

By applying this axiom, certain differences between the subjects of international law can be highlighted, depending on their legal nature, their capacity to take part in the normative elaboration and application process.

Another current difference is that states are considered as primary, classical subjects of international law, while international organisations, civil groups and other entities are considered as secondary or special subjects. It follows that by putting this ontological axiom into practice, international law can become more flexible and adaptable to the diversity of existing interests and perspectives,

\(^9\) For example, in the interpretation of international treaties and agreements, the logic of the included third party is useful in situations where their terms and clauses are ambiguous or incomplete and by admitting a third, indeterminate truth value, the interpretation of terms and clauses is made more flexible and rigid interpretations that may not reflect the intention of the parties are avoided.
which evolutionarily supports the development of a fairer and more efficient system for resolving contemporary international challenges, especially in the context of technological change.

The logical axiom (moving from one level of Reality to another) can serve public international law by recognizing that there is a close connection between the different levels of reality of the object and subject, and that this connection can be understood and managed through the logic of the included third party. Although the embedded third party is full of mysteries especially in the field we deal with in this paper, it can prove useful when we seek to understand and manage the interactions between the different levels of object and subject reality in international law. Applicable, when researching a specific issue, we are to consider not only its physical or political level, but also its social, cultural, economic and environmental levels.

In the remainder of the paper, we will also present some aspects of these levels. The logic of the enigmatic third party included can develop a more robust and equitable decision-making process by integrating many different perspectives into the whole mechanism of regulatory development and enforcement.\footnote{When negotiating and drafting an international convention, the perspectives and interests of different international groups and actors will be taken into account in order to arrive at a solution that truly encompasses as many aspects of the subject matter as possible.}

The epistemological axiom encompasses the complex structure of the totality of the levels of reality and each level is what it is because all levels exist at the same time. This axiom can find an effective role in public international law by recognising that the rules and norms of international law are constructed in the context of multiple levels of reality, which supports understanding and managing the interactions between the different levels of reality in the structure of international law issues. Issues of this kind are generally influenced by political, social, cultural, economic, environmental and security factors, and these levels of reality are obviously interconnected and influence each other.\footnote{E.g. at a general level, climate change regulations we observe take into account not only the impact on the environment, but also on the economy, security and welfare of the population.}

We will take this exercise further with a comparison. According to Basarab Nicolescu’s model, the four levels of reality are 1) the physical or empirical level perceptible by the senses and which can be studied by the scientific methods of physics, chemistry and biology; 2) the quantitative or mathematical level which concerns mathematical models and mathematical symbols, used in the exact sciences; 3) the mental or psychological level as the level of thought and consciousness, which can be studied through psychology, philosophy and other humanities; and 4) the transmental or transpersonal level – is the transcendent level, which goes beyond the individual limits of consciousness and refers to the connection with a higher level of existence and knowledge.

What would the application of these levels of reality in public international law generally mean?
1) The physical or empirical level is where we are in the study of the effects of the physical actions of states or individuals on other states or persons (or entities). Here we have the example of transboundary pollution which can be considered a complication of public international law whereby the physical or empirical level of pollution and its impact on the environment and the health of the population is brought into question.

2) The quantitative or mathematical level can be implemented by using mathematical models and mathematical symbols to analyse and understand public international law phenomena. A mathematical model can be used very well to predict the evolution of conflicts between states or to analyse the economic impact of sanctions imposed by one state against another.

3) The mental or psychological level is reached by studying thought and conscience in the context of public international law, where we are mainly concerned with the analysis of human rights and the responsibility of states to protect them, through the study of values, morals and ethics, and we will see these connections below.

4) The transmental or transpersonal level is when there is recognition of a higher level of existence and knowing that goes beyond the individual boundaries of consciousness and is based on increasingly global and transpersonal connections. In this context we cite the example of new attempts at codification in animal law, nature law or the law of the soul and bioenergy of life forms. 

As specialists, if we take into account these four levels of reality, perhaps we could develop a more appropriate and comprehensive system of deepening, which would lead to one result: a well-deserved attempt to develop a system of international law more sensitive to the plurality and diversity of levels of reality it faces. Implicitly, this also implies the appropriate modification of the law curriculum through the introduction of transdisciplinarity in law.

Of course, in these approaches we will also take into account some criticisms that can be made of transdisciplinary theories in their application to public international law. We refer, first of all, to the complexity sometimes considered excessive. This may be compounded by the difficulty of measurement, as it may seem that in transdisciplinary theories it would be difficult to measure the results of their application in the field of public international law in order to assess their effectiveness. But is there another applicable theory that is not subject to this criticism?

Further to the exposition of possible criticisms, it could be that transdisciplinary theories are often criticised for being accessible only to experts, which can make it difficult to apply them at the general level (including in public international law). And, even if we overcome this set of possible criticisms, in the end...

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there are problems of practical application which can be difficult because of institutional limitations and problems of cooperation between different organisations, states or other international actors. For these reasons, the solution that emerges *ab initio* is the creation of international transdisciplinary law departments.

This is only the first stage in the transdisciplinaryisation of law. The next section will be devoted to presenting the main characteristics of the complexity needed to introduce the transdisciplinary research proposal.

### 2.1. The complexity of Edgar Morin

The third pillar of transdisciplinarity, complexity, takes its deepest and most scientific form in the thought of Edgar Morin, which is why this author will be the theoretical reference for this section.

The fundamental idea is to focus on the established organization, to describe the parts of an object, their organization and interaction with the whole and with the other parts of the object, as well as the relation of the object to elements from other sciences in a context that encompasses all phenomena. Blaise Pascal’s thought clarifies this problem: ‘[… ] The parts of the world all have such relations and such a chain with each other that I consider it impossible to understand one without reaching the others and without penetrating the whole’\(^{13}\).

In order to understand this interconnection of all elements, complexity, in addition to the analysis of the object itself, takes into account other aspects of the object, namely the *context*, the *global*, the *multidimensional* and the *complex*, which by no means exhausts the object and does not cancel out disciplinary research — which excludes these elements — but provides a richer analysis of the problem when they are seen together in a complementary relationship.

The literature has ‘felt’ transdisciplinarity although it has not always carried that name. This set of transdisciplinary rules is often referred to as ‘interdisciplinary’ and is used to gain a richer understanding of legal issues\(^ {14}\). It is often referred to in the Saxon system as: ‘intersection’ between several disciplines, or cross-disciplinarity, transculturality, disciplinary interconnectedness, disciplinary syncretism, disciplinary convergence, disciplinary holism, transcontextuality or cross-disciplinary diversity. In China, for example, the concept of transdisciplinarity is often associated with the term ‘xueke guanxi’ (*学科关系*), which roughly translates as ‘interdisciplinary relations’.

Researchers and thinkers, including Stefan Lupasco, Basarab Nicolescu, Edgar Morin, Ervin László and Ilya Prigogine, have contributed significantly to the development and popularisation of this concept. E. Wilson affirmed the uni-

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ified theory of knowledge across disciplines – an Esperanto between physics, biology, social sciences and humanities. In fact, from the beginning, in the process of scientific knowledge, it is worth noting the success of several scientists’ attempts to bring together certain different concepts for comparative analysis, as we found in the works of the scientist Constantin Rădulescu Motru, who went further after trying to base certain opinions on different sciences such as biology, philosophy, history in particular, psychology, the arts, etc. and subjected some theories to analysis by connecting the cosmic environment, the soul environment with the natural environment, opposing the soul world to the material one. E. O. Wilson’s book, Consilience, was also a revelation in the same sense. This jump together of specialists from different fields but also of substantially different notions can provide unified theories particularly useful for scientific research.

Context, as mentioned in the introduction, is the environment in which the object is situated, affecting it at the same time as it is affected. For example, in physics, the same experiment repeated in different environments can have different results. Similarly, in law, the same legal rule in different legal systems will have different interpretations, which is why context cannot be ignored by blind reduction.

Some probability theories continue to help the law where legal precedent is not recognised, for example, by recognising more frequent judicial practice (thanks to Bayesian probabilities). The propulsion of technological transformation has brought law closer to integrating social, technological and ethical issues, all of which paves the way for innovation in legal education. Bayesian theory and learning can be applied in law today in a number of ways, provided they are adapted to the specific context of the legal field. The algorithms that underpin the artificial intelligence used in the legal field are inspired by Bayesian theories. In law, there are often situations where the likelihood of a particular event or interpretation of the law needs to be assessed. Bayesian theory can be used to update convictions based on new evidence in court trials, where the jury or judge thus assesses the probability of a defendant’s guilt based on the evidence presented. In legal practice, Bayesian methods can be used to develop models that

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15 See C. R. Motru, Personalism in Energy and Other Writings, published successively from 1927 until 1984, when it was republished by Eminescu Publishing House, pp. 267, 271.
16 Edward Osborne Wilson, Consilience: The Unity of Knowledge, Random House (1998), in which he explores the chemistry of the mind and the genetic basis of culture or postulates the biological principles underlying works of art, from cave drawings to Lolita, apud Cristina Elena Popa Tache, Vers un droit de l’âme et des bioénergies du vivant, Ed. L Harmattan, Collection: Logiques Juridiques, 2022.
17 Morin, Edgar. The Seven Knowledges Necessary for the Education of the Future. Trad. Catarina Eleonora F. da Silva, Jeanne Sawaya. 5. ed. São Paulo: Cortez, 2002. p. 36. In the work cited, Morin explains: ‘Knowledge of information or data in isolation is insufficient. It is necessary to know information and data in their context in order for them to acquire meaning. In order to have meaning, the word needs the text, which is the context itself, and the text needs the context in which it is enunciated. In this way, the word “love” changes its meaning in context, and a declaration of love does not change its meaning.’
take into account both available data and prior knowledge to make more accurate estimates of risk and better predictions.

By way of demonstration, we state that Bayesian networks provide a concise way to represent conditional independence relations in a domain and to make inferences. For law, one can use dynamic Bayesian networks that represent temporal probability models. They are organized in time slices and each slice can have several state variables $X_t$ and evidence variables $E_t$.

To build an RBD, you need to specify:

- A priori distribution of state variables $P(X_0)$
- Transition model $P(X_{t+1} | X_t)$
- Observation or sensor model $P(E_t | X_t)$

In turn, these networks can model Markov processes. According to the Markov assumption, the current state depends on a fixed finite number of previous states. It is among the algorithms that are used in judicial processes involving Artificial Intelligence when establishing, for example, the degree of dangerousness of an individual based on recidivism.

In the figure, it shows:

(a) a Markov process of order I
(b) a Markov process of order II.

In theory, it has been noted that in the last 20 years, worldwide and especially in the United States, there has been a serious debate on the use of Bayesian methods in legal matters. Statistics have become evidence in legal proceedings\textsuperscript{18}. If we follow the line of innovation given by legal informatics or computer law, we could think of developing, why not? a Bayesian Law, to support specialists in better understanding the phenomenon of technological change. Bayesian law currently seems more than a chapter of general legal theory because Bayesian theories are widespread internationally and already underpin artificial intelligence algorithms. At present, it could constitute a discipline, although we cannot exclude its formation as a branch of law in the future. This would require the grouping of

legal institutions according to criteria: objects of regulation, method of regulation (legal equality or subordination), quality of subjects (a certain quality is required), character of legal rules (dispositive or imperative), character of sanctions, principles. The law is obliged to keep pace with new trends. The phenomenon of globalisation, with repercussions in the field of law, is interpreted by some authors as a natural adaptation of law to the new forms of interdependence and global awareness.

The positive aspect that emerges from this is the effort made by specialists to analyse and re-establish the limits through appropriate regulations. The role of transdisciplinarity is the same as that of a foundation, because, as the Transdisciplinarity Charter states, transdisciplinarity is complementary to the disciplinary approach; from the confrontation between disciplines, it brings out new results and new bridges between them; it gives us a new vision of Nature and Reality. Transdisciplinarity does not seek to develop a super-discipline encompassing all disciplines, but to open up all disciplines to what they have in common and to what lies beyond their boundaries (art. 3).

The global, a broader environment than context, refers to the relationship between part and whole. To know the whole you need to know the parts, and to know the parts you need to know the whole, in an interdependent relationship. Hyperspecialisation (which will be discussed in section 3 of this research) ignores the whole, analysing only the parts, without their interaction with the whole: ‘[…] hyperspecialisation prevents the perception of both the whole and the essential. It even prevents us from properly addressing particular problems, which can only be proposed and thought about in their context.’

Multidimensionality refers to the relationship between the parts of an object and other parts. The same applies to the integration of social, technological and ethical aspects in almost all branches of law.

Finally, in order to understand complexity, we initially consider the etymology of the word complexity, which is what has been woven together. ‘Complexity is the union of unity and multiplicity.’

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21 The Charter of Transdisciplinarity, adopted at the First World Congress on Transdisciplinarity, Convento da Arrábida, Portugal, 2–6 November 1994, paved the way for numerous studies that have made a huge contribution to the evolution of scientific research worldwide.
23 Ibid, p. 38. In Morin’s words: ‘Complex units, such as the human being or society, are multidimensional in this way: the human being is at once biological, psychological, social, affective and rational. Society includes historical, economic, sociological and religious dimensions… Relevant knowledge must recognise this. Not only is it impossible to isolate one part from the whole, but also the parts from each other the economic dimension, for example, is in constant interrelations with all the other human dimensions.’
This idea makes it possible to relate to the complex system, which conceives of its elements in terms of the relationship between the parts and themselves and the whole. When studying parts, it is necessary to conceive of them in different ways: as a function of the whole, in isolation, in relation to other parts. In addition, it is necessary to consider that the part is also a system, which has interacting parts, and that there is always a connection which is essential for transdisciplinary research.

And above the systems, there are other systems, forming a polysystemic chain — a system of systems. Finally, Morin gives us a definition of the complex system, clearly prioritising the organisation of knowledge: ‘From now on, the system, or organized complex unit, appears to us as a pilot concept, resulting from the interactions between an observer/conceptualizer and the phenomenal universe; it allows us to represent and conceive complex units, made up of organizational interrelations between elements, actions or other complex units; the organization that binds, forms and transforms the system has its own principles, rules, impositions and effects; the most notable effect is the constitution of a global form which feedback on the parts and the production of emergent qualities, both globally and in the parts; the notion of a system is neither simple nor absolute; it includes, in its unity, relativity, duality, multiplicity, division, antagonism; the problem of its intelligibility opens a problem of complexity.

This interdependence between all parts of the complex system means that the elements cannot be understood in isolation. The quest to visualise this complexity constitutes the transdisciplinary attitude described in Article 1 of the Transdisciplinary Charte: “Any attempt to reduce the human being to a mere definition and to dissolve it into formal structures, whatever they may be, is incompatible with the transdisciplinary vision.”

Given the idea of complexity, a pillar of transdisciplinarity, the following section will present transdisciplinary research (its idea and methodology), which is necessary to relate it to law.

2.2. Transdisciplinary Research

Transdisciplinarity does not claim to be a hyper-science or a science of sciences. It does, however, defend the existence of a unity of science that is achieved through communication and articulation between the plurality of research fields, establishing a true network in which each discipline retains its autonomy but participates in a larger unity that represents the complex system. All

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25 In order to fully understand the concept below, it is necessary to refer to elements that have not been explained but are part of Morin’s thinking.


27 Freitas; Basarab; Morin, op. cit., 1994.
the disciplines that intend to carry out transdisciplinary research must be contextualised in this articulating system of fields of knowledge, in which, ultimately, all fields of knowledge communicate with each other—directly or indirectly—with all the others. This is the only way to transcend reductionism and open a bridge to the transdisciplinary method.

It should be noted that this articulation is not a random linking of all fields of knowledge. Based on the idea of levels of Reality (the first pillar of Transdisciplinarity) there are preliminary stages in which the major fields of knowledge are initially interconnected\(^\text{28}\). For example, connecting a specific legal discipline does not relate directly to equally specific research in physics, but the system in which one discipline is included relating to the system in which the other discipline is included. In other words, there is a direct relationship between large fields, whose branches have an indirect relationship with other fields. To demonstrate this, we return to the example of international law, highlighting its links with mathematics, which have so far been little treated\(^\text{29}\). For example, international conventions are typically drafted in complex legal language, and sometimes expressed in precise mathematical terms. In these cases, mathematics can be used to interpret and analyse legal texts and to determine their clarity and coherence.

Also, through game theory as a branch of mathematics that deals with the study of strategic decisions taken in a context of social interaction, we can analyse the behaviour of states in international negotiations to better understand the decisions they take and to predict the outcomes of these decisions. International economics, e.g. is closely related to both international law and mathematics, through the study of international trade relations, capital flows and other economic issues that can be regulated by international treaties. For lawyers, knowledge of international economics can be useful in understanding the effects that various trades or investment policies may have on countries or regions. Legal calculus also has a role to play in that here, mathematics can be used to assess the legal consequences of certain facts or situations: mathematics can be used to calculate the damages resulting from an accident, to determine the value of a contract, or to

\(^{28}\) Morin divides knowledge into three major fields: physics, biology and anthroposociology, all with their respective divisions and subdivisions and taking into account the links between the fields (MORIN, 2008, p. 332).

\(^{29}\) We just do a brief review of some as well: 1) international trade disputes where mathematics calculates financial losses and assesses damages; 2) determining the value of an investment and the rate of return; 3) for the delimitation and use of international waters, mathematics calculates the quantities of water available and determines its distribution between different states; 4) in cases of pollution or natural resource management to assess the impact of human activities on the environment and to develop mathematical models to identify environmental solutions; 5) in the analysis and interpretation of statistical data on human rights violations in a particular region or country; or 6) in mathematical modelling of judicial processes to identify problems in the judicial system and to improve its efficiency and effectiveness.
calculate the probability that a certain event will occur\textsuperscript{30}, which can be important when analysing risks and making decisions in international law.

In terms of theory, mathematics can be used to develop mathematical models that describe the relationships between different variables and factors in international law, as is the case when mathematics develops economic models that describe the impact of a trade treaty on national economies or models that describe the evolution of international relations over time. As well as being able to calculate damages in cases of harm caused by violations of international rights, it can assess the impact of international decisions such as border disputes or issues related to the use of shared natural resources. Mathematical methods develop legal theories and concepts in international law such as the “intersection of sovereignty” or the “intersection of interests”, which are used to manage legal problems in international relations. Algorithms to identify violations of international rights can detect and prevent this phenomenon\textsuperscript{31}.

Algorithms can also be used to draw the lines of a robot’s behaviour, more precisely, under the conditions of computer ethics, artificial intelligence is programmed to respect the applicable law. The solution, for research and education, would be a transdisciplinary department in every discipline today, which would be closer to reality and have the potential to satisfy specialists in their diversity. Referring only to law, we note that this does not mean looking from one discipline outwards, but it means 360-degree law based on a transdisciplinary chair for profound analysis and sustainable solutions.

In order to explain the transdisciplinary proposal, which has so far been presented in a more abstract way, it will be compared with other types of research – disciplinary, interdisciplinary and multidisciplinary.

Firstly, it is about large-scale disciplinary research. A discipline is a delimited field of scientific knowledge, with a specific object that is often isolated from its context, with its own language, with terms that have a semantic load specific to its field – for example, the concept of solidarity in the law of obligations has semantics used only in this discipline – and its own method, which seems to prevent communication with other fields of knowledge. Until now, within a specific field, the discipline has been sovereign in the face of any attempt to relate to external elements. The whole complex that articulates myriad disciplines continues to be fragmented, establishing, like a map, boundaries between

\textsuperscript{30} Mathematical calculus is used as a tool in Bayesian theories.

\textsuperscript{31}Regarding the intersection of sovereignty, through mathematics we can develop various scenarios on territorial sovereignty and state power: we determine the most effective strategy to defend a country’s borders or calculate the impact of a military intervention in a disputed area. At the same time, at the intersection of interests, mathematics analyses and even models the interactions between the different interests of states. More concretely at an applied level, it determines the economic effect of a trade treaty between two states or determines the impact of climate change on the natural resources and geopolitical interests of different states. Appropriate policies that take account of these possibilities can reduce the risk of conflict between states.
For an International Transdisciplinary Chair

territories that are only imaginary lines that do not exist in reality. The development of science around disciplines, while promoting invaluable advances in knowledge, is proving insufficient, because this practice results in the negative effects of reductionism, often leading to a situation where the discipline is unable to solve the problems within its competence.

This type of research is extremely fruitful, providing a wealth of information, but, as Morin states in Kuhn’s interpretation, “The development of science does not take place through the accumulation of knowledge, but through the transformation of the principles that organize knowledge”\textsuperscript{32}. In the same vein, Nicolescu reinforces the importance of the advances provided by disciplinary research, but compares the proliferation of disciplines – with over eight thousand disciplines organized in Nicolescu’s taxonomy — to a new Tower of Babel due to the diagnosis of their incommunicability.

Interdisciplinarity, on the other hand\textsuperscript{33}, establishes points of contact between disciplinary boundaries, relativising their sovereignty. Interdisciplinary research often gives rise to a new field of research with disciplinary characteristics by connecting two or more disciplines, such as biophysics and bioethics. This type of research weakens isolated scientific development because it establishes connections that require the opening of frontiers, but continues to privilege local and decontextualised knowledge, failing to recognise the complexity of its objects, which are connected to all things. Interdisciplinarity can be represented by the image below\textsuperscript{34}, in which each letter represents an autonomous discipline and relates to other fields to study a theme’ [t].

\begin{center}
\begin{tikzpicture}
\t\node (A) at (0,0) {A};
\t\node (B) at (1,0) {B};
\t\node (C) at (2,0) {C};
\t\draw [->] (A) -- (B);
\t\draw [->] (B) -- (C);
\end{tikzpicture}
\end{center}

Multidisciplinarity addresses complex problems, dealing with systems that no single discipline can encompass, such as the Universe, the Earth, the ecosystem and environmental issues. It is usually developed by researchers from different fields focusing on a common problem, analysing it from the point of view

\begin{itemize}
\item \textsuperscript{33} The thinker who proposed the scheme of evolution of disciplines was Eric Jantsch, who went so far as to differentiate between disciplinary, multidisciplinary, interdisciplinary (with categories), metadisciplinary and transdisciplinary research. All of these are plotted and are evolutionary stages of complexity. However, for the purposes of this research, these categories will be simplified, adopting the synthetic and nomenclatural classification (which differs subtly from Jantsch’s) used by both Morin and Nicolescu for this evolution. An explanation, while indispensable at deeper levels of explaining transdisciplinarity, is dispensable. Transdisciplinarity, is dispensable for an introductory paper.
\end{itemize}
of different disciplines and establishing complementarities between analyses. In short, it is an association of disciplines around a problem whose scope falls outside the domain of a single discipline, requiring a joint effort to cover the problem. The figure below illustrates this approach, where ‘D’ represents the common problem that requires the cooperation of the other disciplines to address.

![Diagram](image)

Finally, transdisciplinarity is only possible by considering its pillars, at this point emphasizing the complexity that affirms the connection of all things in a great polysystem. Nicolescu states that the prefix *trans* refers to ‘what is at the same time between disciplines, across disciplines and beyond any discipline’.

Furthermore, he proposes the reconnection between subject and object, acknowledging a margin of subjectivity in scientific research, supporting the margin of uncertainty and error at its various levels and domains. It does not constitute a new discipline, but merely promotes broad communication so that disciplines can serve as tools for understanding the world, addressing problems through contextualisation, globalisation, reconnection and complexification. According to Morin, ‘transdisciplinarity today means indisciplinarity.’

It is a cognitive schema that opens frontiers, forming the link between all knowledge and thus unifying science.

The representation below will be enlightening, where ‘G’ represents the problem to be addressed, but is properly contextualized in a system that interacts with all other spheres and their subdivisions:

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35 Nicolescu, 2005, p. 53.
37 Although the picture does not illustrate it, each letter has its own divisions. For example, in the subject ‘A’ you will have identified as ‘A1, A2, A3’ etc.
This type of research does not exclude the forms explained above; on the contrary, it needs them. Transdisciplinary hypotheses aim to organise knowledge, but without disciplinary research this cannot be achieved. Nicolescu explains how all disciplines — like all things — are interrelated: ‘Discovering this dynamic necessarily involves disciplinary knowledge. Although transdisciplinarity is neither a new discipline nor a new hyperdiscipline, it feeds on disciplinary research which, in turn, is illuminated in a new and fruitful way by transdisciplinary knowledge. In this sense disciplinary and transdisciplinary research are not antagonistic but complementary.

In this way, the science of law, if seen as a polysystemic whole (based on the recognition of complexity through transdisciplinarity), will be seen in relation to other disciplines, making it possible to relate law to other social spheres and to the unity that these spheres (including law) form, and giving individuals space to express themselves.

In the light of the analyses carried out in this section, transdisciplinarity shows promise, but a challenge remains: how can we link this epistemological proposal to legal science? In order to answer this question, the next section will analyse the structure of scientific revolutions proposed by Kuhn, linking it to the current paradigm of Law and Transdisciplinarity.

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38 Article 3 of the Charter for Transdisciplinarity says: ‘Transdisciplinarity is complementary to the disciplinary approach: it brings out new data from the confrontation of the interlocking disciplines; it gives us a new vision of nature and reality. Transdisciplinarity does not seek to dominate the various other disciplines, but to open them all up to what cuts across and goes beyond them.’ (Freitas; Nicolescu; Morin. 1994).

39 Nicolescu, 2005, p. 54.
3. Paradigm Shift Based on a Scientific Revolution

Transdisciplinary studies are beginning to emerge in the legal sciences. Alongside all this, for the transdisciplinary method to work properly, it is necessary for it to be at the *paradigmatic* level, and not just to relate to transdisciplinary elements.

Promoting transdisciplinary research in legal science means understanding legal phenomena from a transdisciplinary point of view and attitude, not by simply drawing parallels or appropriating elements to label research as complex or transdisciplinary, thus becoming a fad, as Ernildo Stein says.

Nicolescu explains that there are degrees of transdisciplinarity, just as there are degrees of scientifiveness. Taking the transdisciplinary proposal to a paradigmatic level would maximise the degree of transdisciplinarity in legal research. In law, at present, this is mainly carried out at a local level and far from the scientific proposal of the Charter, but it is nevertheless an extremely useful approach, as it contributes to the propagation of this perspective. However, considering transdisciplinarity as a paradigm, as a guiding star for research, would offer new horizons for such studies.

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41 Stein, Ernildo. *Preface* In: ‘Streck, Lenio Luiz. *Hermenêutica Jurídica e (m) crise: uma exploração hermenêutica da construção do Direito*. 8 ed. Porto Alegre: Livraria do Advogado, 2009.’ pp. 6–10. p. 6. ‘We should write about certain topics only when our analyses have opened up a new space. Otherwise, we fall into repetition. Gloss or even parody. In the field of law, this has happened with scandalous frequency. That’s why we rejoice whenever a new perspective presents itself, whether it’s to broaden our theoretical vision, raise hypotheses about case law or make a new contribution to the epistemic universe.’

42 ‘[…] there are degrees of disciplinarity proportional to the greater or lesser fulfilment of the three methodological postulates of modern science. In the same way, the greater or lesser fulfilment of the three methodological pillars of transdisciplinary research generates different degrees of transdisciplinarity. Transdisciplinarity research corresponding to a certain degree of transdisciplinarity will be closer to multidisciplinarity (as in the case of ethics); to another degree, it will be closer to interdisciplinarity (as in the case of epistemology); and to another degree, it will be closer to disciplinarity.’ (Basarab Nicolescu, 2005, p. 55).

43 Interdisciplinary and multidisciplinary studies are common in legal research, with more and more lines of research emerging in this direction. However, the CIRET-UNESCO project, a result of the 1997 Locarno International Congress on Transdisciplinarity, explains that with regard to transdisciplinarity, ‘the aim of pluri [or meta] and interdisciplinarity is always disciplinary research’ (Basarab Nicolescu). All these forms of research, disciplinary, interdisciplinary, multidisciplinary and transdisciplinary, are necessary and complementary. Transdisciplinary studies are still a few.
3.1. The Structure of Scientific Revolutions for Thomas Kuhn

The purpose of this article in reflecting on the transdisciplinarity of law is precisely to demonstrate that transdisciplinarity, not only as a method, but especially as a vision and attitude, must be seen as a paradigm; otherwise its proposal will be distorted. In this vein, Kuhn’s reflections are timely because they clarify how one paradigm in one scientific community succeeds another.

The semantics of the concept of paradigm is used by Thomas Kuhn in two main senses: ‘Paradigm’ is used in two different senses. On the one hand, it indicates the whole constellation of beliefs, values, etc. shared by members of a given community. On the other hand, it denotes a type of element in that constellation: concrete solutions to puzzles which, when used as models or patterns, can be used to solve problems.

One sense encompasses the other. The broadest is called the disciplinary matrix, which is referred to when we talk about the paradigmatic revolution. It consists of a) symbolic generalisations, which manifest themselves in the use of symbols by the scientific community, which also gives these symbols their own semantics — such as the elements of an equation in physics (E=mc² in relativity theory), or the concept of resolution in the law of obligations, for example. b) collective beliefs and commitments, which constitute the presupposition from which scientific research starts, and these presuppositions are not questioned — as if they were dogmas — such as the belief in the non-existence of atoms, present in physics until the 18th century, or, to a lesser extent, the belief in the non-existence of atoms. c) values, which are initially subjective elements that are reflected in research, in Kuhn’s words: ‘[…] theory must be chosen for reasons that are ultimately personal and subjective’. This characteristic manifests itself in relation to the theoretical choices that are given to the research. There is therefore a margin for subjective values that will be objectified by the community and will constitute the paradigm. d) the example, as the second meaning of the term paradigm, which designates the formation of the researcher within a certain disciplinary matrix, which takes place from the beginning of his/her career. The various factors that contribute to the constant formation of the scholar constitute the exemplar.

This training creates a paradigm, in the sense that it will be the prism from which the scientist will view his research.

With paradigm concepts in hand, it is possible to enter into the merits of

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44 From the Greek parađeigma, giving the idea of pattern and pattern.
45 The term is polysemic, and twenty-two different definitions can be found in Kuhn’s work. But of these, only the two used in this research are indispensable.
the forms of development of scientific knowledge indicated by Kuhn.

The first of these relate to the accumulation of knowledge through continuous analysis of the subject matter, fragmenting and progressively verticalising knowledge. If problems arise in this research, in order to maintain the consistency of the scientific premises with the results obtained, it is sufficient to create a new category or a local reformulation of the concepts, without having to change the premises guiding the research.

This form of development relates to most research, which increasingly fragments its object, delimiting it in order to better understand it, as described by Descartes’s second rule of method\(^{49}\). Lately, this type of research\(^{50}\) has begun to fragment not only objects, but also to compartmentalize disciplines, a context in which Nicolescu states that there is a new Tower of Babylon. The same context allows Hilton Japiassu to state that ‘We have reached a point where the specialist is reduced to the individual who, at the cost of knowing more and more about less and less, comes to know everything (or almost everything) about nothing’\(^{51}\).

Kuhn also states that sometimes the accumulation of knowledge runs into inconsistencies that cannot be resolved by changing categories or local reforms, making it necessary to change the premises on which the research is based so that the results obtained will again make sense. In other words, removing paradoxes requires real scientific revolutions.

This is the second way in which scientific knowledge is developed. These are revolutions in which the previous paradigm is abandoned, which requires more profound changes, opening up space for the establishment of new premises capable of guaranteeing the coherence of scientific activity for the time being.

Scientific revolutions can be schematically represented as follows\(^{52}\):

\[ \text{Prescience} \rightarrow \text{normal science} \rightarrow \text{crisis/revolution} \rightarrow \text{new science}. \]

The first stage, called foreknowledge, is characterised by a relative acceptance of fundamental concepts. At this level there is not really a scientific community that shares a paradigm that prescribes a method and it is a disorganised activity that precedes the formation of normal science.

Normal science, on the other hand, is practiced by a scientific community

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49 ‘To divide each of the difficulties we are examining into as many tranches as possible and as many as necessary to better solve them.’ (Descartes, René. *Discurso do Método*. Trad. J. Guinsburg and Bento Prado Júnior. 2 ed. São Paulo: Abril Cultural, 1979. —The Thinkers—. pp. 37–38.).


in which all the characteristics of a *disciplinary matrix* can be verified. In addition, work in normal science is carried out with the help of the first form of knowledge pointed out by Kuhn, namely the accumulation of information which is organised in the light of the paradigm. However, in the course of research, problems and limitations may arise in their method or in the coherence of the information discovered. As already mentioned, most of these can be resolved.

However, some problems constitute real crises which, in order to be overcome, require changes in the disciplinary matrix, a context in which the paradigmatic revolution guiding the scientific community takes place.

Kuhn states that revolutions are necessary because ‘there are no inductive procedures for arriving at perfectly adequate paradigms. Consequently, science must contain within it a means of moving from one paradigm to a better paradigm’\(^53\). For example, this happened in the transition from Newtonian physics to Einstein’s relativity, a theory that can explain why the orbit of Mercury behaves differently from that predicted by Newton’s gravity. However, the acceptance of Relativity involves revolutionising the physics paradigm that existed until then. The same reasoning can be observed in law, where a metaphysical ideal of justice derived from natural law has been abandoned, giving way to legal positivism.

Thus, in the light of the new paradigm, a new science emerges which, after the paradigmatic transition, will be seen as a normal science and can develop until it encounters a new crisis, which, to be overcome, will require a new revolution, and so on\(^54\).

Finally, Kuhn highlights three main characteristics of scientific revolutions: first, they are *holistic*, since they affect the whole paradigm, leading to changes in values, premises, symbolic generalizations, etc.; as a corollary of the first characteristic, the second one appears, which is the need for a *new taxonomic formulation* to organize the elements of the *new science*. As the guiding principles of the paradigm are modified by the first feature, concepts that are taught in the light of this new paradigm will have to be adapted, leading to a reorganisation of the disciplinary matrix to promote coherence of science; the third and final feature is the need for a new taxonomy.


\(^{54}\) There is another implicit question worth addressing: to what extent do revolutions in one science affect other sciences? For example, Transdisciplinarity, which uses elements from physics to think about the human sciences, if there is a revolution in that science, will it be affected? The answer to this question depends on how the relationship between the sciences is viewed. Thus, considering that there is a link between all of them, as Complexity demonstrates, a revolution in one field would affect all the others. For example, in the modern era, when the ideal of accuracy in physics was seen as a model to be copied by the other sciences. In addition to these issues, the intensity of the effects of a revolution in one science on other fields is directly related to the level of generalisation of the science (the idea of levels of reality), i.e. the broader the scope of a science, the greater the implications for other fields, so that a revolution in one field would affect all the disciplines it encompasses and other related fields, but a revolution within a specific discipline of a field – e.g. a branch of biology – would not have the same effect.
The main feature involves changing the semantics of pre-existing concepts. For example, the concept of gravity has a different semantics in Newtonian physics than that used in quantum physics, and the concept of justice in the legal sciences has different definitions depending on the paradigm in which it is thought. In Kuhn’s words, this feature involves changes in ‘knowledge of nature which is intrinsic to language itself and which is therefore prior to anything that can in any way be characterized as description or generalization, scientific or every day’.

The perception of Law from a transdisciplinary perspective, within what Transdisciplinarity aims to be, is only possible if a paradigmatic revolution is achieved. Below we will analyse some guidelines for legal education that show signs of transdisciplinarity and can be interpreted as the beginning of a new paradigm.

3.2. Signs of the Transdisciplinarisation of Law and its Close Correlation with Education

Adopting transdisciplinarity requires a paradigm shift — through a change of attitude and worldview — and cannot be implemented programmatically, i.e. by simply reformulating disciplines. This means that it is not enough just to have a project that takes a transdisciplinary approach. Transdisciplinarity, in addition to a scientific methodology, is an attitude and a worldview that its scientific methodology incorporates. Thus, the incorporation of interdisciplinary research into curricula or the creation of multidisciplinary research lines are indispensable but insufficient to recognise the potential paradigm. To this end, a deeper reform is needed.

In the field of law, there have been recent developments that are worth addressing, as they represent important steps towards the paradigmatic transition, even if they act only at a programmatic level, but favour the paradigmatic one.

In Brazil, Resolution CNE/CES No. 5 of 17 December 2018, establishes the curricular guidelines for the undergraduate course in Law, in Article 2, § 1, IV, when referring to the pedagogical project, states that it must include interdisciplinarity as an element of the Law programme. This legal provision can be interpreted extensively to cover higher degrees of interdisciplinarity — as Jean Piaget did when he first used the term transdisciplinarity as an advanced level of interdisciplinarity. At least in the field of epistemology, interdisciplinarity was a step towards Transdisciplinarity. In the case of legal education, at the right time, the same phenomenon may operate.

Also in the same resolution, there is the following provision: Article 3.

The undergraduate degree course in Law must ensure that the student profile includes a solid general, humanistic and axiological training, the ability to analyse, master legal concepts and terminology, to argue adequately, to interpret and appreciate legal and social phenomena, combined with a reflective attitude and a critical outlook that foster the capacity and ability for autonomous and dynamic learning, indispensable for the practice of legal science, the dispensation of justice and the development of citizenship.' And in Article 5, 1: 'The fundamental training axis aims at integrating the student in the field, establishing the relationship between Law and other fields of knowledge, including studies involving essential contents of Anthropology, Political Science, Economics, Ethics, Philosophy, History, Psychology and Sociology.'

In order to achieve the same objectives as these norms of Resolution CNE/CES No. 5, the proposal for the transdisciplinarisation of Law is presented, as its epistemological basis will provide the necessary support for the realisation of the pedagogical guidelines presented for legal education. The full effectiveness of Resolution CNE/CES No. 5 cannot be achieved by studying the various fundamental disciplines in isolation, even if they are verticalised. It is essential to organise them by highlighting their mutual interactions, identifying the common objectives of these disciplines for the humanistic training of lawyers. And this possible organisation between the different fundamental disciplines of the undergraduate law course would find an abundant source in Transdisciplinarity, the aim to which the proposal for the transdisciplinarisation of Law contributes.

Decision No. 75 of the National Council of Justice, in Annexe VI, states that magistrates must have knowledge of legal sociology, judicial psychology, ethics, philosophy of law, general theory of law and politics, which are essential disciplines for understanding the legal phenomenon. This resolution does not mention the communication of these disciplines, but given that their objective is humanistic education (title of the Annexe) it is implicit that they revolve around this axis, assuming a multidisciplinary bias.

National systems, however, are not ready for a transdisciplinary approach to law. For example, in Romania, Annex 24 of the Order of the Minister of National Education and Scientific Research no. 6129/20.12.2016 does not recognize interdisciplinary articles or participation in interdisciplinary scientific events, even when the topic is strictly related to law. Only participation in conferences or congresses organized by international scientific societies ‘in the candidate’s specialization’ are recognized by positive points. At the time of writing, the

58 The Order of the Minister of National Education and Scientific Research no. 6,129/20.12.2016 approves the minimum necessary and mandatory standards for the awarding of teaching titles in higher education, professional degrees in research and development, the quality of the PhD supervisor and the habilitation certificate. The new minimum standards, available in the annexe to the
public consultation process for new standards has been completed with a view to issuing a new Ministerial Order to recognise the validity of some types of interdisciplinary or transdisciplinary research. The new draft of the Minimum Standards necessary and obligatory for the conferral of the teaching title of university lecturer and the professional rank of scientific researcher grade II includes a provision in the text of the Commission for Architecture and Urbanism, which recognises: ‘Publications in extenso in the proceedings of scientific conferences in architecture, urbanism, landscape architecture, design and restoration, and related sciences – for transdisciplinary specialisations, at international/national/local level’. In the same Draft, the Commission of Legal Sciences for the verification of the national minimum standards necessary and obligatory for the conferral of the title of University Lecturer recognises for the first time at this level in paragraph C that ‘The organising entity may also have an interdisciplinary profile – if it has an expressly mentioned legal component: e.g. philosophy of law, sociology of law, economic analysis of law’.

In reality, in fact, legal education in Romania is carried out even on levels connected to transdisciplinarity, so that it becomes incomprehensible to maintain regulatory provisions that limit the modern development of specialists.

There is a growing awareness among legal scholars and practitioners of the need to move beyond traditional disciplinary boundaries in order to understand and respond to the complexity of international legal issues. This transdisciplinary approach to international law education is being embraced in Romania, as evidenced by the increasing number of courses and programs that incorporate both legal and non-legal disciplines. The University of Bucharest offers several courses in international law that incorporate transdisciplinary elements, such as Environmental Law, International Economic Law and International Human Rights Law.59 These courses are taught by legal scholars, but also draw on expertise from other disciplines such as economics, political science and sociology. They are to focus on an interdisciplinary approach to international law, exploring the ways in which different disciplines can contribute to understanding and addressing the complex issues of international law. The Romanian National School of Political and Administrative Studies in Bucharest also offers a range of courses in international law with a transdisciplinary approach, including courses on International Human Rights Law, International Environmental Law and International Trade Law, among others. These courses are taught by experts from different disciplines, including law, international relations and political science. The University of Craiova also offers courses in transdisciplinary international law

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focus on the interaction of legal and non-legal perspectives on international law. Among the topics covered are International Human Rights Law, International Environmental Law and International Commercial Law. The National University of Political Studies and Public Administration in Bucharest also offers courses in international law with a transdisciplinary approach to focus on the relationship between international legal and non-legal disciplines, exploring topics such as International Human Rights Law and International Environmental Law.

Finally, the University of Oradea offers a range of courses in international law, including International Human Rights Law, International Environmental Law and International Trade Law, with a transdisciplinary approach. These courses are taught by legal scholars, but also draw on expertise from other disciplines such as economics, political science and sociology.

In the context of the accelerated evolution of society and technology, the need to adapt the legal discipline through education is obvious. In a sense, law is forced by the dynamics of society to change through interconnection. We consider the importance of integrating social aspects, including gender perspective, cultural diversity and social responsibility, into the legal learning process. We also consider the impact of technology on legal practice, highlighting the need for robust training in emerging technologies such as artificial intelligence, blockchain and cyber security. It has become more important than ever to pay particular attention to the ethical dimension, stressing the importance of legal training in professional ethics and awareness of the ethical consequences of legal decisions.

An effective transdisciplinary law curriculum should provide students with skills and knowledge that transcend the boundaries of traditional specialisation and foster a holistic understanding of legal issues, which argues for the need to establish an international transdisciplinary department in legal education institutions. This would facilitate the exchange of experience and knowledge between

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61 At the university level, for example, the National University of Political Studies and Public Administration (SNSPA) offers an interdisciplinary program in European Union Studies (EUS), which is designed to provide students with the skills and knowledge to understand the ever-evolving challenges posed by the European Union legal framework. The program combines courses in the fields of law, economics, political science, sociology, and international relations. At the post-graduate level, the Romanian Institute of International Studies (IRSI) offers a specialized program in International Law and Global Governance. This program combines courses in international law, economics, international relations, and public policy – as well as a dissertation – in order to develop a comprehensive understanding of the legal, political, and economic context of international relations. Several universities in Romania have begun to offer courses that combine traditional legal studies with other disciplines, such as philosophy, political science, and economics. For example, the University of Bucharest offers a master’s degree in European Law and Policy that blends courses in law, economics, and political science to provide an in-depth understanding of the European Union’s legal framework.
specialists from different fields, thus contributing to the formation of a generation of lawyers prepared for the future of our planet.

Discussions at this stage are concerned with the extent to which the curriculum is adaptable and responsive to societal metamorphoses while ensuring its relevance. Last but not least, future perspectives are considered, including how the curriculum can evolve in line with anticipated changes at the macro, meso or micro level. The latter includes the introduction of compulsory cross-disciplinary literacy courses in the law school curriculum. First and foremost, the Chair would serve as a conducive environment for the exchange of experience and knowledge between specialists in different areas of law globally. On the one hand, opportunities for collaboration and dialogue between professors, researchers, other international scholars and practitioners foster diversity of perspectives and approaches in the teaching process, and, on the other hand, students gain access to diverse contexts and perspectives, preparing them to work in international and multicultural legal environments.

At the level of educational units, such an international chair attracts world-renowned professors and researchers, strengthening the faculty’s reputation for transdisciplinarity. This facilitates academic exchange and contributes to the development of a dynamic and influential academic community, which serves as a centre of innovation, encouraging continuous curriculum development to respond to transformations in the legal field and in society. New areas of study can be developed, and finally the law can gain a serious chance for its evolution, and this would be worth every possible effort to achieve this goal.

In conclusion, the shift from one paradigm to another, i.e. from the current disciplinary view of law to a transdisciplinary one, will have repercussions on new horizons of research and teaching in legal sciences. The documents cited can be interpreted in a way that corroborates these ideas.

Once we have clarified how the paradigmatic transition from the current disciplinary approach to law to a transdisciplinary one takes place, and what it will take to overcome this phenomenon, a new question arises: how can we think about the law from a transdisciplinary perspective? In order to point to a possible way to solve this question, as well as to verticalise the analysis of the paradigmatic revolution within legal science, the following point will be developed.

4. The Crisis of the Legal Paradigm and the Possibility of its Transdisciplinarization

Law centralises the most important decisions of a society (in all its complexity), so a transdisciplinary attitude and vision can greatly contribute to a global understanding of the role of law in a polysystemic whole. All social issues

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62 There is a need for a rigorous platform for academic programmes and cross-border research projects capable of providing students with opportunities to engage with international legal issues and develop intercultural competences.
have an impact on the law, so the actions of lawyers will affect the course of society.

Allowing the legal order to be operated only by lawyers without a complex vision of the legal phenomenon, thinking of it as an object detached from society, may burden this whole order, which is why a complex thinking of law is needed. So, just as Morin said that ‘science is too serious a process to be left solely in the hands of scientists’, so to law is too important to be left solely in the hands of lawyers. Moreover, since the law centralises all problems, whatever their nature – sociological, moral, economic, etc. – it is transdisciplinary par excellence.

In order to better problematize these issues, the first part of this section will explain why legal positivism can be considered the paradigm of legal science; the second part will identify some of the reasons for its crisis, such as the disconnection from the empirical plane and the distancing from ethical-political issues in the context of contemporary philosophy of law; and in the third and final part, we explore the possibility of transdisciplinarization of law in the context of the crisis of its paradigm.

4.1. Legal Positivism as a Current Paradigm in Legal Science

For a new science to emerge — in Kuhn’s framework — there must first be a crisis in normal science. Therefore, we must first identify the paradigm of law.

The dominance of the legal positivist way of thinking about law is notorious, and can be considered the paradigm of law. Wayne Morrison states that ‘legal positivism is a label that covers a set of related approaches to law that have dominated Western jurisprudence for the past 150 years’.

Legal positivism has exerted and still exerts a particular influence on the development of the science of law, and consequently on its practice, since this science has developed on the basis of its epistemological proposition. This was first formulated by John Austin, in his line of thought known as Analytical Jurisprudence, which sought to make only factual judgments, not value judgments, in legal matters. Later, legal positivism reached its (epistemological) peak in Hans Kelsen, who, building on Austin’s foundation, the Kantian categories of being

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63 Morin, 2005, p. 133.
64 Legal positivism by no means sums up the science of law, but its important place is undeniable. Therefore, this research will examine only this line of thought.
66 It should be noted that legal science does not refer to the branches of law, which relate more deeply to legal texts, using their own hermeneutics legal texts, which use their own hermeneutic methods and their own language. The science of law discussed in this chapter is the science that deals with the legal order, studied mainly by Philosophy of Law and General Theory of Law.
and being and the scientific matrix of the Vienna Circle, developed the Pure Theory of Law, a landmark work for law\textsuperscript{67}. Legal positivism brought invaluable advances to the science of law. However, in the face of complexity and transdisciplinarity, it has limitations and shortcomings that deserve to be highlighted.

To this end, this research will only examine Kelsen’s thinking on methodological issues. Jurists who have continued Kelsen’s thought, such as Bobbio, Hart, Ross, etc., are considered post-Kelsenian because they cannot be understood without Kelsen’s thought. They improved the description of positive law on the basis of Kelsen’s epistemological proposal, without going into the epistemological problems that characterise this paradigm.

Thus, disciplinary presuppositions are predominantly developed by Kelsen. The epistemological discussion of post-Kelsenians, compared to their theoretical framework, is simplified. Therefore, in order to establish a dialogue between the disciplinary approach of legal positivism and transdisciplinarity, the analysis will be limited to Kelsen’s contributions in Pure Theory of Law. Only epistemological issues will be analysed. Starting from its epistemological basis, all other important features of the law described appear as a logical consequence of the methodology used\textsuperscript{68}.

### 4.2. The Crisis of Legal Positivism. Some Particular Details of International Law

The aim of pure legal theory is to study valid positive law, in other words, the universe of legal norms in a given society. Thus, it seeks only to describe positive law as it is, without prescribing how it should be. This description is carried out under the aegis of an eminently disciplinary methodology and, as such, has limitations in the face of the proposed paradigm of transdisciplinarity.

The disciplinary approach manifests itself mainly in the delimitation of the subject matter. In order to describe the legal order, it has been isolated and decontextualised from its relations, whether global or with other social spheres,

\textsuperscript{67} Morrison, \textit{op. cit.}, 2006, p. 410. Morrison also points to three features of this paradigm: (i) the argument that law is a human creation; (ii) the claim that our analysis of law would follow the methodologies that have been successful in the natural sciences, specifically that they would be value-free, and that the quest of legal philosophy is a search for ‘realist’ truth; and (iii) that the concept of law does not imply any substantive moral claims; in other words, that empirically, law can present/represent any ideological or moral position.’

\textsuperscript{68} This is not the place to analyse all the points in Kelsen’s broad theoretical formulation. In attempting to describe the Law in isolation, it is inevitable to reach conclusions that are so close to Kelsen’s, if not identical, that it would be futile to carry out a symbolic analysis of the symbolic recapitulation of the characteristics of the law verified by legal positivism. The fact that the legal order is structured in a step-by-step manner, with a hierarchy of that every act has a legal significance; that the sanction is the legal consequence of the offence; that magistrates carry out the authentic interpretation of legal rules, etc. These are important features of pure legal theory, but they are not its essence for this analysis.
so that only the legal order has been analysed in a *purely* way.

All elements of politics, economics and sociology, as well as moral issues, are removed from law. Thus, everything that is not eminently legal is eliminated from the pure Theory of Law. This disciplinary pruning is done in order to delimit the object of legal science, which does not include other dimensions, but only the legal one, because otherwise there would be influences from other disciplines in the study of the legal order. Kelsen justifies this approach in order to ‘avoid a methodological syncretism that obscures the essence of legal science and dilutes the limits imposed by the nature of its object’.

Kelsen’s perspective on the law has undeniably contributed to the development of legal science and legal practice, but it has limitations inherent in the disciplinary approach. Among the main criticisms of Kelsen’s thought is that the Pure Theory of Law eliminates the relationship between law and justice, so that a legal order can be valid whether or not it conforms to a particular conception of justice.

It follows that the pure theory of law is an eminently formal, structural theory that can be used to analyse a positive legal order. The idea of the methodological principle used is to delimit the object. Moreover, by pursuing the judgement on the object (a widely accepted principle in epistemology—the importance of epistemological ethics), the importance of ethical considerations on law is not denied, only that this issue belongs to another discipline and is not the subject of Pure Theory of Law. This excuse is valid in the disciplinary approach — and to a lesser extent in inter- and multidisciplinarity and multidisciplinarity — but it is not accepted in the spirit of transdisciplinarity, which aims at a global understanding of phenomena.

From this premise, legal science deals only with the validity of legal rules, regardless of their moral content. The only validity that matters for legal theory to analyse is the validity of positive law as a structure. According to this premise, legal science is concerned only with the validity of legal norms, regardless of their moral content. For pure legal theory, the only validity that matters is the validity of positive law as a structure.

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69 Kelsen, Hans. *Pure Theory of Law*. João B. Machado. 7. ed. São Paulo: Martins Fontes, 2006. p.1. In Kelsen’s words: ‘When it calls itself a “pure” theory of law, it means that it intends to guarantee a knowledge that concerns only law and to exclude from this knowledge everything that does not belong to its object, everything that cannot be rigorously determined as law. In other words, it wants to free legal science from all elements that are alien to it. This is its fundamental methodological principle.’

70 Ibid, p. 2.

71 Kelsen, Hans. *The Problem of Justice*. João Baptista Machado. 4. ed. São Paulo: Martins Fontes, 2003. p. 11. In Kelsen’s words: ‘To disregard the validity of all rules of justice, both the validity of those which are in contradiction with a rule of positive law and those which are in harmony with a rule of positive law, i.e. to admit that the validity of a rule of positive law is independent of the validity of a rule of justice – which means that the two rules are considered to be simultaneously valid – is precisely the principle of legal positivism.’
A related criticism, and one of the most striking aspects of reductionism, is that the legal order is described independently of the social sphere. As a corollary, the question of the efficacy of legal norms, their applicability in the social sphere, is excluded on the grounds that this question is a matter for sociology and not for a positive legal science\(^{72}\). In this point, as well as in several other — such as the problem of the validity of law — Kelsen does not deny the relevance of these questions nor their correlation with law, but stresses that the solution of these problems originating in the relation of law to objects in other disciplines must be solved outside the science of law, whether in philosophy, sociology, economics or political science\(^{73}\). These criticisms exemplify the fact that Kelsen has been widely criticized for his theory of not taking into account elements he did not set out to analyze when he delimited its subject matter. However, in the context of the Pure Theory of Law, Kelsen cannot be criticized for this position because his intention was not to address such issues. Thus, within his sole objective of describing Law, it makes no sense to enter into meta-legal issues that are the subject of autonomous sciences.

Today, there are a number of legal phenomena that legal positivism cannot address, in particular institutions or branches of law that have a certain international character. An example of this is the phenomenon of *Lex mercatoria*, which, in general terms, is a systematisation of rules based on custom and customary law that aims to accompany the development of private legal relationships at international level. Theories of legal positivism cannot be used to understand this phenomenon.

As far as public international law is concerned, a number of questions remain which we will address below. Looking at its historical development, we cannot fail to note that it is a relatively new branch of law, being the creation of states as traditional, classical subjects of international law. Today, public international law is a fundamental discipline, which stands out for its expansion, effervescence and importance against the backdrop of the current global problems requiring very close cooperation between its subjects. *Just as the instinct of sociability leads man to form the family, the tribe, the state, so to the state — although at first isolated — is forced over time to enter into contact with other states*\(^{74}\). Alongside states, the family of participants in legal relations under international law has multiplied, giving rise to international organisations, for example.

Today’s society is experiencing an unprecedented level of internationalisation, be it through technological advances, the kaleidoscope of global crises, armed conflicts or financial and health reforms. Solutions to manage and prevent

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\(^{73}\) These criticisms have been cited because they reflect the evolution of legal phenomena, in all their complexity, which can no longer be understood on the basis of legal positivism.

them have led to the proliferation of digitalisation and the search for new strategic solutions, including from a theoretical point of view. Society has therefore turned towards the development of international norms, creativity and transdisciplinarity as a tool for understanding and regulating all the problems arising from them, noting the influence of strategic and technological developments on the meaning and interpretation of international law itself. But how can we connect all this today and create new spaces in legal creativity?

For international law, in essence, legal positivism argues that the law should be seen as a set of written rules, and that legal authority derives from a higher source, such as the constitution or international treaties, rather than from moral or natural principles. From this point of view, there is only one possibility: to bring positivism within the limits given by the fact that there is no central authority in public international law; otherwise state sovereignty would be vulnerable. Paradoxically, on the other hand, legal positivism focuses on the respect and application of the rules and procedures laid down in international law, which can help maintain the sovereignty of states in relation to other states and international entities. The rationale extends to strengthening the peaceful settlement of disputes by avoiding the escalation of conflicts and maintaining international peace and security, or promoting equality between states and respect for each other’s sovereignty by building and maintaining a climate of trust and cooperation.

Tracing historical developments, we can observe another characteristic of international law: the shift of this field from isolation to actual universality, from statocentrism to cosmopolitanism. Some authors consider that international law became universal when jurists from semi-peripheral countries, such as Japan, the Ottoman Empire and Latin American states, appropriated the legal thinking of the European international community. International law is moving from anonymity to universality, amid increasing interconnections between the subjects of this law. This universality is, in fact, the direction towards the transdisciplinary destination and represents a relevant natural evolution given by the society in transition. It can be said that transdisciplinarity and universality support each other in the destiny of international law.

However, in international law legal positivism is often applied to analyse and interpret international treaties and other sources of its own. The focus is on the rules and procedures established under international law and how they are

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applied by states and other international legal entities. In order to manage some practical issues, the focus is on compliance with and interpretation of the texts of international treaties, protocols and conventions, as well as compliance with recognised international custom and the relevant case law of international courts. It is an approach that focuses on concrete rules and procedures rather than on moral or ideological principles.

This has led to some criticism. Some specialists are opposed to international normative positivism, mainly because of the minimal space in which the above would be possible. Moreover, they consider that ‘non-positivism in international law (i) does not lead to quietism in terms of norms (ii) or in terms of the system as a whole (iii) does not give too much power to international judges or (iv) do not act against democratic values, (v) does not lead to anarchy and (vi) cannot be an instrument of imperialism, but rather an instrument against it’.

These criticisms are directed more at the idea that international legal positivism is a good thing than at the idea of extracting what is necessary and real from it to be useful today. Specifically, the criticisms converge along the extreme lines: good or bad or traditional or exclusive positivism versus nontraditional inclusive positivism. For example, while Joseph Raz believes that the separation of law and morality is inevitable, Ronald Dworkin is convinced that it is impossible.

By its characteristics, legal positivism provides certainty and predictability in the interpretation and application of international law, which contributes to maintaining order and stability in international relations, facilitates consensus and cooperation between states by establishing clear rules and a legal framework acceptable to all international actors. All of these are set in the category of benefits. On the other hand, a criticism of positivism in international law is that it can be too rigid and inflexible in its approach (which is tantamount to difficulties in adapting the law to changes in society and in solving often difficult problems), it can limit the ability of international law to promote justice and morality because it focuses exclusively on compliance with established rules and procedures, without taking full account of ethical and moral issues.

Legal positivism sometimes ignores or underestimates human needs and individual rights in favour of the strictly formal application of international law.

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In this context, situations arise where human rights and other humanitarian aspects are neglected in the interests of states or other participants in international legal relations.

The separation and consideration of positivism, reported to the middle limits, without considering the extremes, depends on the perspective and context in which it is applied. We can deduce from this that for the transdisciplinarisation of international law, legal positivism can be both a pathway to the transdisciplinarisation of law and a hindrance, depending on how it is applied and integrated into legal practice and academic research.

In terms of adaptability, legal positivism can provide a solid and clear basis for integrating other disciplines into the legal field, because by focusing on rules and procedures, it facilitates the understanding and application of concepts and theories from other fields, such as sociology, economics, psychology, etc. Here, transdisciplinarisation of law can be encouraged by identifying intersections and connections between law and other disciplines (legal positivism can provide a stable and predictable exploratory legal framework).

At the same time, the transdisciplinarisation of law can be hindered by legal positivism, which is considered rigid and inflexible in its approach, thus limiting the exploration of other perspectives or the integration and application of concepts and methods from other disciplines in law. In fact, the exclusive focus on legal rules and procedures may again lead to a limitation of vision and insight from other areas that might be relevant for understanding and solving legal problems.

The transmethodical approach can in no way be understood or used to erase certain branches of law, but its purpose is to highlight the strength and value of their regulatory function. Although, at first glance, the process by which one discipline is influenced by others may be perceived as a loss of disciplinary autonomy or as a merger, this argument does not seem to stand up to the benefits of using transdisciplinarity as a highly effective tool, rather than as a disease of a discipline marked by an inability to maintain its autonomy. There may be situations in which some legal scholars reject or are reluctant to entertain the idea of transdisciplinarity. Among the main reasons is professional conservatism, lack of knowledge or confidence, lack of time or resources, difficulty of interdisciplinary communication (especially different language which can lead to frustration), perceived lack of relevance (it may be thought that solutions from other disciplines are apparently not relevant to legal problems or that these solutions do not apply to the specific legal context), resistance to change, but all these barriers can nevertheless be avoided through open communication, and education about the benefits of transdisciplinarity, successful examples and gradual collaboration.\(^{80}\)

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We may encounter specialists who remain attached to professional traditionalism and who may consider that legal knowledge alone is sufficient to deal with problems of the same nature, and that is all. They may be reluctant to bring in elements from other disciplines, feeling that they will be distracted from their normal responsibilities.

Another reason that has already been invoked in practice is the perceived risk of dilution of professionalism which manifests itself in concerns that the integration of knowledge from other disciplines could dilute the specificity of their profession and lead to loss of professional identity or, loss of disciplinary autonomy. On the contrary, new skills can be absorbed and new developments found, which is an opportunity, not a disease of the disciplines, as we will discover later. It is only through a very general view that relevant conclusions can be drawn. So far, disciplinary isolation has failed to demonstrate that it can lead to any progress. Maintaining such a conception is a chimera, an exercise that already consumes time that could be used to develop new possibilities. There have already been proposals in the literature that legal education should focus on the interconnections between international law and other disciplines such as international relations, political science, economics, history, sociology and anthropology.\(^81\)

Against the background of developments outside specific sources and standards, a trend towards constructivism has emerged in the evolution and dissemination of international standards, harmoniously complemented in our analysis by constructionism. We will examine its current general meanings so that the study can take the basic form we are trying to outline through inter-, multi- or transdisciplinary methods.

Some differences require explanation. From the point of view of legal sociology, we speak of constructionism as a new orientation based mainly on Gergen’s works published after 1990, works that inform us about how reality can be known and especially how realities can be constructed. There are different definitions of social constructionism, based on the recognition of the multiple realities generated by the different interactions between the actors who construct these realities. This method, by its very nature, can lead to some essential developments in current international law, mainly through attempts to explain evolution.

According to this theory, international law is not a static and fixed entity,
but is socially constructed through interaction between states and other international actors. It is learning (knowledge) theory that emphasises the importance of constructing knowledge and understanding through interaction between the individual and the surrounding world, particularly evident in the field of human rights⁸³ (by extrapolation we can also refer to the reality of certain international organisations or states), which is relevant at the international level for all participants. In theory, this analysis is particularly useful to address the problem of the lack of a ‘vocabulary’ in international law to deal with the collective dimension, without perpetuating an individualistic vocabulary. Issues such as the conflict between self-determination and state integrity or the effects and limits of state sovereignty in an increasingly internationalised world need to be adjusted⁸⁴.

To return to constructivism, it is also possible to create certain tangents between the realities of legal subjects depending on the dynamics of international law, which can be explained by changes in the perception of the identity of states and other international actors and by the evolution of social norms and values. In international law, this theory provides an exercise for a better perception of the behaviour of participants in terms of compliance or non-compliance with these rules. In this way, social norms and values become fundamental in the construction of the identity of international actors and thus in the orientation of their behaviour. In this way, answers can be found to the question of what might be the reasons why some states respect international law while others violate it?

Several levels of these possibilities are outlined below. One of these is the implementation, in the context of specialist education, of notions of the different ways in which international law and these other areas interact and influence each other. It has been suggested in theory that transdisciplinary methods of teaching and energising international law should contain both elements from different cultures and legal traditions of the world and details of how international law interacts with them in practice. Finally, consideration has been given to the analysis of different theoretical and practical aspects of international law, such as international human rights law, international criminal law and international economic law, enabling an understanding of different types/subtypes of international law, both classical and hybrid or related⁸⁵.

The specificity of this branch of law lies in the emphasis placed on its

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fundamental concepts, essentializing what determines the whole, being considered as a science of essentialization and, after all, the role of any scientific research method is to analyze, discover and highlight what this branch of law represents as a whole, what determines it, the links of this whole with other sciences, the composition and structuring of the system and the foundation of the articulations between its components\textsuperscript{86}.

In the light of legal positivism, it would lead to retrograde positions. Thinking about the form of law in isolation from its realisation proves insufficient\textsuperscript{87}.

Another notorious example is that of human rights, the legal discussion of which necessarily involves entering the axiological sphere, analysing cultural diversity in an attempt to extract a substratum. It is not just a question of formal validity that is effective, as such discussions transcend the legal aspects analysed by Legal Positivism.

At the same time, there are theories that go beyond legal positivism in several respects. Carla Faralli\textsuperscript{88} groups them along different lines, all of which have developed out of a realisation of the shortcomings of Legal Positivism. Of the lines presented by Faralli, two are more topical in this context of paradigmatic transition. The first refers to a return of Law to ethical-political values, an indispensable element for the understanding of democratic constitutions; while the second line, which represents the abandonment of the eminently formal approach to Law, re-approaches the social problems that constitute a legal realism, which underlies critical discourses on Law.

In this context of the crisis of the paradigm of legal science, Losano points out essential elements for a global understanding of the legal phenomenon, which are not studied by legal positivism, but which a transdisciplinary approach cannot ignore: [...] as long as there is a society with a legal system, there will also be a need to reflect on justice, on the structure and function of legal norms, on the behaviours that should be encouraged or repressed, in short, on the type and level of order that should govern that society\textsuperscript{89}.

\textsuperscript{87} In this respect, Friedrich Müller developed his theory of the structuring of law by demonstrating the close relationship between the legal norm (form) and the empirical whole (reality): ' [...] the constitutional specificity in principle can only be fully understood from the point of view of the totality of the general political whole in this sense. The fact that the environment alone determines the content and individuality of the constitution is an important perspective in legal theory or one of its requirements for the general theory of the state.' (Müller, Friedrich. \textit{Structural Theory of Law}. Trans. Peter Naumann and Eurides Avance de Souza. São Paulo: RT, 2008. p. 103).
Pure legal theory cannot be used to understand the complexity of the law. The isolated description of the structure of positive law, while necessary, is insufficient. Kelsen was always aware of this and even stated it. Kelsen adopted a disciplinary approach to law – in other words, complementary to the transdisciplinary approach. Given the plurality of possible approaches, he chose the formal one, which by no means excludes the other disciplines. These are different facets of the same legal phenomenon, the full understanding of which was never Kelsen’s claim. Aware of this, Losano makes the following comment: ‘Are we really sure that form is the fundamental element for understanding law? Excluding any examination of the inside (i.e. of reality) and any examination of the outside (i.e. of value, of justice), Kelsen is in the position of someone who wants to talk about the egg by proposing to be silent about the chicken as well as the yolk and the white. Are we really sure that the shell is the fundamental element for understanding the egg? If we don’t talk about the hen, we won’t understand the origin of the egg, its structure or (excuse me) its shape; if we don’t talk about the yolk and white, we won’t explain its purpose or its possible uses. On the other hand, however, to talk about the egg in an exhaustive way, we should also talk about the shell’.

The delineation of the object is not a problem in the proposed disciplinary research, but if it is viewed from the point of view of complexity, there is a mutilation of the innumerable properties and characteristics of the Law, which are revealed from the interconnections with other objects and which are not analysed as a result of the methodology used. Of course, what lies outside the delimited object can be studied by other sciences, but what is compromised is the understanding of the wholeness of the legal phenomenon. Moreover, transdisciplinarity aims to understand the fields and forms of connection between different sciences, which is not possible from the perspective of legal positivism.

In this context, the criticism that can be made of complexity and transdisciplinarity is that describing the law as an isolated object is not the best way to understand the legal order. To this end, in the face of the crisis of legal positivism, the challenge of thinking about the law from the perspective of transdisciplinarity is necessary.

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90 Kelsen *apud* Losano, Mario G. *Introduction.* In: Kelsen, Hans. *The Problem of Justice.* João Baptista Machado. 4. ed. São Paulo: Martins Fontes, 2003. p. xxv: « Law can be subject to different sciences. The pure theory of law was never meant to be the only possible or legitimate science of law: there is also the sociology of law and the history of law. These, together with the structural analysis of the law, are necessary to fully understand the complex phenomenon of law ».

91 Losano, 2003, p. XXI.

92 Note that despite all these limitations of the legal positivism proposal, its contribution is undeniable. There is a thorough study of the formal aspect of law, and relating these aspects to aspects in other disciplines leads to a different interpretation of the form of law, but this is only possible by virtue of the study of structure.
4.3. Transdisciplinarity as a Foundation for Legal Science

A transdisciplinary perspective aspires to overcome and organise the fragmentation that exists in the disciplinary fields of law and related fields of knowledge, allowing for a different description of law that takes into account the social, formal, historical and moral spheres, etc. To this end, Kelsen’s entire contribution must be taken into account, since understanding the law in its complexity from a transdisciplinary perspective also means describing the form of law.

The partial perception of the legal order by the Pure Theory of Law, coupled with the awareness that this view does not encompass the totality of the legal phenomenon, implies the provisional character of the Kelsenian legacy. If even in physics, where the most precise results are obtained, there are constant revolutions, the law could not aim at a definitive formulation. Kelsen’s contributions to law are undeniably great and he has made such great advances that no other jurist has ever equalled them. But it is clear that it is not a definitive theory that could be refined, as was in fact the case with Legal Positivism, which was improved mainly by Hart and Bobbio, as well as by Kelsen himself — to name only the most important authors. However, the crisis of this paradigm was inevitable. The emergence of problems and issues in law that could not be explained by Legal Positivism inevitably led to its theoretical weakening, opening a wide and favourable field for the proposal of new theories.

The transdisciplinarity of law, given its complexity in its description, is similar to Kelsen’s objective, but from a different paradigm and methodology, leading to the adoption of a different approach to the subject. Legal positivism described law from a formal, disciplinary perspective, considering it as an isolated object. Thinking about law from a transdisciplinary perspective implies understanding it from the perspective of its complex interactions.

In the same way that Morin clearly states that ‘complexity is a challenge, not an answer’, the proposal to transdisciplinaryise law has a challenging tone. The incorporation of transdisciplinarity into the science of law has been treated as a possible hypothesis, but not a necessary one. It is a proposal that will eventually be accepted (and may be rejected), but in the early stages of formulation, this research is limited to presenting the possibility of pursuing this path.

Complexity exists in social phenomena and, consequently, in law. However, in Sigmund Freud’s semantics, the vision of the interconnectedness of all

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93 Kelsen, 2006, p. xviii. Aware of this, Kelsen states in the preface to the Pure Theory of Law: ‘This second edition of the Pure Theory of Law also is not intended to be regarded as a presentation of definitive results, but as an attempt to be further developed by additions and other improvements. Its purpose will have been attained if it is considered worthy of such development — by others than the present author, who is already at the end of his powers.’


elements, which is the synthesis of complex thought, is at an *unconscious* level for the scientific community. The problematization of transdisciplinarity can contribute to raising the interconnections to a *conscious* level, which would give rise to new directions for legal science. Awareness of this *complexity* is not possible for a scientist isolated from a discipline, but it is the *transdisciplinary*96 *dream* of the scientific community formed by Transdisciplinarity intellectuals.

To conclude this study, a comparison between the proposed transdisciplinarity of law at the paradigmatic level and a legal phenomenon recognized by jurists will be enlightening.

There is now more and more talk about the constitutionalisation of civil law and private law as a whole, a view which suggests that ‘one cannot claim to adapt the Constitution to the Civil Code and it is essential to proceed in the opposite direction in order to rework and forge the entire infra-constitutional fabric under the innovative and binding cloak of the broader text’.97

This needs to adapt, championed by the most innovative civil servants, not to mention other branches of law, is relatively new. However, within the science of constitutional law, the concept of *constitutional filtering has existed for a long time*, according to which whenever the legal order is innovated by the emergence of a new Magna Carta, it is necessary to filter, to adapt, the entire infra-constitutional legal order, checking which rules will be accepted or not, promoting the appropriate adjustments of those accepted to the new constitutional guidelines.

Likewise, the essence of the illustrated relationship between the Constitution and infra-constitutional norms – in which the principles laid down in the Constitution are used as hermeneutic vectors to promote a rereading of a branch of law – applies between Transdisciplinarity and Law. Transdisciplinarity, as a scientific paradigm, proposes a method of scientific research. Law, as a science, is conducted under the aegis of a paradigm. Just as there is a need for a *constitutional filtering of the* infra-constitutional legal order when a new Constitution is promulgated, there is a need for the science of law to adapt to the paradigm of Transdisciplinarity, since it — like a new Magna Carta — presents new principles and horizons for the whole of Law.

### 5. Final Considerations

The world is complex, but it is not perceived in this way by the disciplinary methodology that has persisted into the modern era. Transdisciplinarity

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96 Parodying the title of Japiassu’s work, the expression is used with the psychoanalytic semantics of ‘dreaming’.


seeks to build a vision and an attitude that can recognise, even if not fully, the complexity of phenomena.

The proposals of transdisciplinarity and, in particular, complexity, which is initially aimed at science, but whose approach would have implications for a variety of topics (potentially applicable to any problem), are presented as a possibility that will eventually be recognised and incorporated by legal science.

In this reflection, I have only presented the challenge and possibility of thinking about the law from the perspective of transdisciplinarity, indicating the first forums of interdisciplinarity that can be broadly interpreted to transdisciplinary law. From this point of view, the methodology and teaching of law would take on a different perspective: the organisation of knowledge would be prioritised, the understanding of the legal system would be extended and linked to other social spheres, while allowing a broad communication with other fields of scientific knowledge.

Alongside all this, addressing the problem at an epistemological level is a preliminary step to using transdisciplinarity in legal research; after all, there is no way to conduct scientific research before the method has been established. This article aims to make first considerations on the link between the transdisciplinary paradigm and legal science in order to problematize methodological issues.

Ultimately, it is about giving up the illusion of doing transdisciplinary research without considering and reflecting on the proposed vision and attitude of transdisciplinarity. The epistemological concept of transdisciplinarity constitutes a paradigm and, as such, proposes new horizons for science. Transdisciplinarity of law is therefore about reflecting on legal issues under the umbrella of transdisciplinarity, not just appropriating its concepts and elements to support certain research.

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