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Logic Probability and Criminal Evidence in Chile: Influence of Common Law Culture?

Probabilidad lógica y prueba penal en Chile: ¿influencia de la cultura del *common law*?

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Abstract: This work examines how the concept of logical probability in criminal evidence—rooted in the common law culture—has been received by Chilean legal doctrine and case law. To do this, I use an interpretation of the principle of sufficient reason as a logical limit within the framework of sound judgment, while also presenting some difficulties detected in this process.

This research aims to contribute to the dialogue between the legal cultures of the common law and civil law systems. It also seeks to deepen into a historical perspective on the evolution of criminal evidence studies in Ibero-American criminal justice systems, because it is necessary to establish channels of communication between common law evidence and continental procedural law to promote rational and fair judicial decisions from a factual standpoint.

The first part of this work examines the concept of logical probability within the context of the new evidence scholarship. The second part focuses on how facts are proven in the civil law tradition, from the Enlightenment to the present. The third part analyzes the concept of logical probability in Chilean legal doctrine and case law. Finally, the last part will explore the feasibility of incorporating the concept of logical probability in criminal evidence law in Chile.

Keywords: Criminal evidence, logical probability, sound criticism, evaluating evidence, criminal process

Resumen: Este trabajo se referirá a la recepción por parte de la doctrina y jurisprudencia chilena en materia penal de la probabilidad lógica derivada del *evidence* anglosajón. Intentaré justificar que ello ha ocurrido a través de la interpretación del principio de razón suficiente como límite lógico perteneciente a la noción sana crítica y también expondré algunas dificultades detectadas.

Esta investigación pretende ser una contribución al diálogo entre las diversas culturas jurídicas del sistema del *common law* y el *civil law*. Este trabajo también busca profundizar en una perspectiva histórica de la evolución de los estudios de la prueba penal en los ordenamientos procesales penales iberoamericanos,

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pues es necesario generar lazos de comunicación entre las perspectivas del *evidence* anglosajón y el derecho procesal continental con el fin de favorecer la racionalidad y justicia de las decisiones judiciales en materia de hechos.

La primera parte de este trabajo se referirá a la probabilidad lógica en el contexto de la *new evidence scholarship*. La segunda parte se referirá a la prueba de los hechos en la tradición del *civil law*, desde la Ilustración hasta nuestros días. La tercera parte se referirá a la probabilidad lógica en la doctrina y la jurisprudencia chilena. En la última parte, se discutirá una posible recepción del concepto de probabilidad lógica en materia probatoria penal en Chile.

Palabras clave: Prueba penal, probabilidad lógica, sana crítica, valoración de la prueba, proceso penal

I. INTRODUCTION

A person who starts studying criminal evidence law in Chile today—and in most Latin American countries—will find a very different landscape from that experienced by scholars who studied it over fifty years ago. Currently, criminal evidence is the subject of abundant literature and has been shaped by both common law and continental European legal cultures. Furthermore, it is possible to observe points of intersection between procedural law and the philosophy of law, within a framework where various branches of criminal justice studies have gained greater academic independence. Similarly, it is now increasingly acknowledged that issues related to "evidence" are not exclusively legal on nature, but they can also be shaped by other fields of study, such as epistemology. This happens because judicial decisions are inherently connected to reality within the process of judging or making decisions on the facts. The contributions of epistemology to the discussion are strongly influenced by the common law understanding of evidence,

which highlights the need for greater openness within continental procedural law towards the way these matters are developed within common law system.

Furthermore, Ibero-American criminal procedures have been strongly influenced by common law criminal justice systems, a phenomenon that can be particularly visible in the legal reforms introduced since the millennium changeover. This influence responded, among other factors, to the fact that common law criminal procedures are strongly regarded as a regulatory benchmark for principles such as orality, promptness, efficiency, and the protection of rights, issues that are incorporated into their evidentiary rules, e.g., the exclusion of illegally obtained evidence.

This study aims at contributing to a better understanding of the evidentiary phenomenon in Chile, focusing on the interaction of its components, as shaped by both the common law and the civil law traditions. I will specifically try to justify that the concept of logical probability—central to the evidentiary culture of the common law—has, to some extent, been received in Chilean legal doctrine and case law, based on the development of the concept of sound judgement and the principle of sufficient reason. The theoretical approach followed in this study is based on a selection of works mentioned below. It is impossible to list all that has been written, given the abundant literature on the topic. Thus, I have very carefully considered those publications that—in my view—have had the most significant impact on the Chilean legal doctrine and case law. However, as a result of this selective effort, many pieces of work have been left out through this discriminating effort. Let me clarify this point.

The first part of this study explains the key features of the concept of logical probability within the framework of the new evidence scholarship. The second part examines the proof of facts in the continental European culture, starting with the Enlightenment era, continuing through the post-codification period and exploring the initial points of contact with the common law tradition. The third section analyzes how the concept of logical probability has been addressed in the Chilean legal doctrine and case law. Finally, the last section considers the extent to which one can speak of a reception of the logical probability concept in the Chilean evidentiary framework.

II. LOGICAL PROBABILITY AND THE COMMON LAW UNDERSTANDING OF EVIDENCE

II.1. The path toward the new evidence scholarship

The main debate surrounding proof within the framework of the US evidence law can be portrayed as a tension between mathematical probability and logical probability. These alternating scientific perspectives have been so strong that they are often regarded as part of the key features of what is now referred as evidentiary rationality (Accatino, 2019, pp. 1 ff.; Twining, 2006, p. 85). For the purposes of this study, logical probability is understood as an approach within—or integrating system of—the "rationalist theory of evidence" (Anderson *et al.*, 2015, p. 319; Jackson & Summers, 2012, p. 15; Twining, 2006, p. 86), which coexists alongside other approaches, such as the mathematical probability.

From a historical perspective, within the common law tradition, the mathematical probability approach was initially presented as the prevailing model, because—among other reasons—it seemed to be very convincing. It suggests that a specific piece of evidence can be assigned a numerical value in relation to other elements, to determine the probability of occurrence of a factual hypothesis, on a 0 to 1 scale, using the Bayes theorem in the judicial decision-making. Although the precise origins of the new evidence scholarship in the United States during the second half of the 20th century remain unclear, this may be because scholars at the time were more focused on other academic fields, leaving evidentiary studies somewhat neglected. It is not uncommon to find academic references from that period suggesting that evidentiary studies were in decline, or that the work of prominent US scholars on evidence had already been completed (Jackson, 1996, p. 311). However, the evidentiary debate strongly reemerged following the *People vs. Collins* (1968) decision, which drew widespread criticism for its use of statistical evidence in judicial reasoning.

In my opinion, the study of J.L. Cohen titled *The probable and the provable* (1977) marked a significant milestone in the development of evidence law within the common law tradition. In his publication, he strongly criticizes the use of mathematical probability as a response to evidentiary issues, introducing the concept of logical or inductive probability as a more appropriate alternative[1]. For a number of scholars, Cohen's work—although published in the United Kingdom—, represents the beginning of a second stage or level in the evolution of the new evidence scholarship (Jackson, 1996, pp. 312 ff.).

1 In the United Kingdom, Cohen's and Twining's works on these matters are an exception to the otherwise slow evidentiary debates, if we compare them with those held in the United States (Jackson, 1996, p. 310).

The tension between mathematical probability and logical probability within the framework of the new evidence scholarship is present in both common law and civil law legal systems. However, unlike the common law tradition, the civil law system lacks a clearly defined, identifiable and autonomous field for evidence law, as opposed to the common law culture (Jackson, 1996, p. 309). As a result, this conflict has not carried the same theoretical weight exhibited in common law countries, because the mathematical probability was not a successful evidentiary approach in civil law jurisdictions. In addition, other factors contributed to this: lack of statistical data, the fact that law practitioners are unfamiliar with numerical coefficients[2], extreme formalism when applying mathematical calculations to complex hypothesis, and the lack of questioning regarding the foundational premises of the mathematical model (Aliste, 2021, pp. 101 ff.; Vera Sánchez, 2014, pp. 247 ff.). Furthermore, the Pascalian probability approach seems to assume that judicial reasoning is a random phenomenon (Nieva, 2010, p. 134).

II.2. The logical probability approach

The impossibility of achieving absolute certainty in factual matters—a situation recognized since the Enlightenment—has produced a great number of doubts, which have been addressed through the concept of logical or inductive probability (Taruffo, 2009, p. 223). Unlike the mathematical or Pascalian probability approach, the logical probability model focuses on the relationship between the information derived from a piece of evidence and the factual proposition that is trying to be proved. It aims at establishing that the fact asserted in one or several factual statements actually occurred, by identifying a primarily inductive connection between evidentiary data and the fact in question.

This inductive link serves to justify the existence of the relationship in the real world by determining the degree of corroboration of the hypothesis. In other words, it is a cognitive process in which an evidentiary element, through inference, leads to a fact-finding outcome that is subsequently compared with the factual statements that constitute the *thema probandum* (Ubertis, 2017, p. 73). The epistemic strength of a fact-finding outcome depends on the strength of the justification that can be inferred or generalized. From this perspective, fact-finding relies on the degree of justification provided by the confirmatory elements (pieces of evidence or reasoning tools) available in support of the hypothesis (Taruffo, 2009, p. 224).

Cohen (1977) argues that inductive probability, understood as a cause-based concept, offers a way to solve several problems associated with quantitative or mathematical probability models (p. 42). From this

2 It has also been portrayed as an "allergy" to mathematics (Nieva, 2010, p. 134).

perspective, the probability of an event having occurred equals the capacity to prove it (provability); that is, what can be inferred from available evidence is regarded as proved (Cohen, 1977, pp. 13 ff.; Gascón, 2010, p. 155; Nieva, 2010, p. 102). Thus, the provability of a hypothesis depends on the strength of the connection between the data and the fact-finding outcome, and this connection is achieved through a generalization or inference criteria.

The evidentiary inference or generalization connects all argumentative nodes (Anderson *et al.*, 2015, p. 139; Schum, 1994, p. 82). Thus, there is a proportional relationship between the degree of inferential support of the hypothesis and its probability (Taruffo, 2009, p. 226). This way, probability is not about confirming the frequency of an event, but rather about validating the evidentiary support and using a generalization or inference in a particular case, within such epistemic structure (Cohen, 1977, p. 203). In the absence of statistical data, generalizations stem from regular experiences or common sense (Bex, 2011, p. 46; Taruffo, 2009, p. 227). This "evidentiary" approach toward fact-finding has a lot in common with the method use to investigate and confirm hypotheses within the framework of experimental sciences (Carnap, 1962, p. 23; Jackson, 1996, p. 314). Indeed, Cohen supports his theory on the observations drawn from the experimental method. The author analyzed the experimental reasoning model used by Karl von Frisch (1964) to study how bees differentiated colors in his work *Bees: Their Vision, Chemical Senses and Language*. To prove his hypothesis, Von Frisch used experiments to gradually discard alternative explanations to the phenomenon observed (Aísa, 1997, p. 293)[3].

Cohen developed his own theory of inductive probability, which involves verifying the degree of survival of the hypothesis through several tests. These tests are designed based on a list of relevant variables or common-sense generalizations that serve to confirm or discard the hypothesis. This is the result of applying the inductive theories of Bacon and

3 Cohen observed that Von Frisch gradually modified both his hypotheses as well as his conclusions, based on the observations he made, thereby breaking away from the linear and unidirectional model often associated with scientific research. In the specific case studied by Cohen, bees repeatedly returned to a sugar-water source placed on a piece of blue cardboard. So, maybe the bees were blind to color blue, and they identified their feeding spot based on different shades of gray? To test this, empty food containers in gray tones were introduced, but the bees kept going back to the blue cardboard. The question was then changed: perhaps the bees were sensitive to blue? But the outcome remained the same, when the blue cardboard was covered. Next, he asked: What if the bees are sensitive to odors? So, he covered the food container with a dish and the behavior persisted. And: maybe bees can't recognize other colors? However, further tests using different colors showed that bees were capable to distinguish between blue-green, blue and ultraviolet. Thus, test circumstances were changed in order to observe variations in the results. If no variation occurred the outcome still aligned with the initial hypothesis. Alternative explanations were ruled out, and then we could assert that the original hypothesis (bees can distinguish colors) was confirmed. In other words, scientific experimentation relies on control groups to test hypotheses in a parallel—but not independent—manner from the data that initially supports them. Cohen recognized that this experimental approach closely resembles the way people use generalizations in their daily lives, and that helped him design his new inductive probability approach (Aísa, 1997, pp. 293 ff.; Cohen, 1977, p. 201).

Mill (Jackson, 1996, p. 313). According to Cohen's model, inductive probability considers both credible evidence supporting the hypothesis being tested, as well as the unanswered challenges to its plausibility (Anderson *et al*., 2015, p. 318). In the words of Anderson *et al*., "we should not ignore what [Cohen] said on the significance of evidentiary completeness, when measuring the weight of evidence" (p. 319). Likewise, Twining (2006, p. 127) points out that Cohen's thesis on the existence of a non-mathematical probability is valid, and that this way of reasoning is appropriate to address many evidentiary issues within forensic contexts.

This approach was shared by Cohen (1977, pp. 14 ff.), Haack (2008, p. 236), Taruffo (2009, p. 256), Wroblewski (1989, pp. 171 ff.), Gascón (2010, pp. 159 ff.), Ferrer (2007, pp. 27 ff.), Ubertis (1996, pp. 27 ff.), González Lagier (2003b, p. 41), Nieva (2010, pp. 103 ff.), Andrés Ibañez (1992, p. 283) and Priori (2016, pp. 179 ff.), among others.

III. THE IBERO AMERICAN CONTINENTAL SYSTEM AND EVIDENTIARY RATIONALITY IN CRIMINAL PROCEDURES: EXPLAINING DIFFERENCES AS A BASIS FOR FUTURE CONVERGENCE

III.1. The Enlightenment era and the facts

Addressing evidentiary issues within the framework of the Chilean justice system would be both limited and inaccurate, if we failed to consider its evolution as an heir to the continental European legal tradition. Indeed, while the current incorporation of the common law evidence-related concepts is significant, it should not lead us to mistakenly assume that the Enlightenment—and its influence on justice systems—lacked an epistemological approach to fact-finding. On the contrary, such approach is the operational context in which our justice systems apply concepts of evidence from the common law tradition, and from this perspective, they have indirectly shaped the continental understanding of these concepts.

According to Gascón (2010), the Enlightenment represents one of the historical moments when it is possible to talk about the unity between legal knowledge and the dominant epistemology. Although this claim is subject to debate, it likely stems from the fact that the Enlightenment was an era marked by the "ruling of facts" (p. 28). The aim was understanding the world and its phenomenon. A fully developed conceptual framework was not worthy in itself—as idealists might argue—, except to the extent it facilitates understanding the meaning and the scope of worldly phenomena. Indeed, two discourses emerged: one of them aimed at promoting the good, and the other aimed at

searching the truth. Only this way, the Enlightenment thinkers could keep religion away from human and natural knowledge (Todorov, 2017, p. 71).

The Enlightenment was marked by the adoption of reason as the primary tool for understanding and explaining the world, a shift largely influenced by the widespread impact of the Newtonian method across various fields of knowledge. Thus, it is not strange—as Gascón (2010) pointed out—that during this period it was said that "every investigator should be a potential Newton" (2010, p. 28). Indeed, the philosophy of the 18th century regarded Newtonian physics as a universal paradigm. According to Cassirer (2013), the Enlightenment "not only considers analysis as the greatest intellectual tool of physical-mathematical thinking, but it also considers it as an essential instrument of thinking in general" (p. 27).

Thus, the positivist thinking of Enlightenment resulted in the divinization of "facts", which fostered a strong reliance on experience (Gascón, 2010, p. 29). It was no longer about knowing the world through the scholastic point of view or the pure mathematical reasoning, but rather through the "logic of the facts" (Cassirer, 2013, p. 23).

During this period, these assumptions were translated to the legal sphere. The growing importance of empirical and/or factual reasoning served as a limit to the exercise of punitive authority, since—in line with the principles of social secularization—the law could no longer punish based on a person's character, but only on externally observable harmful acts (Gascón, 2010, p. 30). This shift laid the foundations for a concept derived from the Enlightenment ideals, one that nowadays is undoubtedly one of the limits to the *ius puniendi*: a criminal law focused on acts, rather than authors (Ferrajoli, 2011, p. 34)[4].

However, despite the Enlightenment's emphasis on empiricism and the appeal of resolving fact-finding issues through logical reasoning—which was in line with the idea of an "automated judge"—, legal practitioners of that time were already aware that facts could not be deductively proved from evidence. They recognized that it is impossible to reach absolute certainty, acknowledging instead the possibility of reaching—with a lot of luck—moral or subjective certainty (Gascón, 2010, p. 31). Thus, it was well understood that historical truths were only a probability, and that judges would never going to accurately know the truth of what actually happened[5]. One might think that inductive probability was an already well-known method during this period; however, in my view, probability during the Enlightenment was understood within

4 Thus, it is understood that legal criminal definitions shall only be referred to empirical and objective behaviors, according to the principle *nulla poena sine crimine et sine culpa*.

5 Se the term "truth" in Voltaire (1995, p. 610).

the framework of deep and complex philosophical debates, shaped by multiple approaches that changed depending on the authors and local nuances. The unifying element was a common adversary: the obscurantism rooted in the Judeo-Christian tradition, which linked knowledge to religion. In this regard, the concept of probability detaches knowledge about human beings and the natural world from religious and/or moral ideas, using instead an empiricist approach and the logic of facts. This shift—by the way—hindered the possibility of a syncretism between intellectual contributions of theological approaches and secular studies of the Enlightenment era. As a result, Enlightenment knowledge came to view itself as responsible—*in ovo*—for creating new structures of knowledge about the world and human beings.

This explosion of ideas and theses during the Enlightenment hindered a serious reflection on the suitability of inductive probability as an epistemic mechanism for understanding reality. Within the framework of the "logic of facts", discussions focused on the validity of a principle of nature universality, and on the contingency of empirical measurements and their ability to explain reality through the laws of nature. For instance, though Hume supported a prevailing factual approach (Todorov, 2017, p. 71), he is remembered—in the history of human thought—as a representative of gnoseological skepticism, in addition of being part of the selected group that represents the English empiricist tradition. Indeed, Hume (2015) points out that, "even if there were no randomness in this world, our ignorance of the real cause of an event would have the same influence on understanding and could result in a similar belief or opinion" (p. 103).

This Enlightenment thinking had an impact on the criminal justice system during the French Revolution era, with a key milestone being the Decree 16 of the French Constituent Assembly, of September 19, 1791. This Decree established in France a jury for prosecution, that had to render decisions according to their deep conviction. It also embodied ideals of democracy and equality, insofar justice was administered by ordinary people without the need for any noble lineage or university credentials. The facts, understood as a reality that imposes itself—without any connection with an idealistic theorization—, could be observed and assessed by anyone. However, such system did not survive; first, due to the effects of the Thermidorian Code of October 25, 1795; and, then—more radically—due to the Code of Criminal Procedure of 1808. The latter replaced the jury system with a written and confidential investigation conducted *ex officio* by a judge, thereby reintroducing the principle of *intime conviction* within the framework of the inquisitorial procedure (Ferrajoli, 2011, p. 140). This resulted in a "mixed process", later incorporated into several procedural codes, including the Italian and the Spanish Codes

of Criminal Procedure. Paradoxically, the French Code of Criminal Procedure of 1808 has been the most influential one in European criminal justice systems during the codification period, despite—in my personal view—representing a setback for the Enlightenment ideals that had supported the incorporation of experimental sciences into criminal justice systems. Thus, with its adoption a barrier started emerging, leading to a full isolation of criminal procedure law—and, with it, evidentiary studies- from extra-legal disciplines during the post-codification era. Maybe Kant (2017) was right when he asked himself if he lived in an enlightened era, and his answer was no. He acknowledged that indeed it was an age of Enlightenment, where several obstacles to general enlightenment, or for people to leave behind their "underage status"—for which people were themselves responsible—(p. 69) had been removed, yet much remained to be done. The French criminal justice system, as shaped by the French Code of Criminal Procedure of 1808, is a good example of the continuous advances and setbacks on this matter.

III.2. Post-codification era, procedural law and the facts within the criminal procedure

The post-codification period can be characterized by a split between the study of procedural law, evidentiary issues and the dialogue with extra-legal sciences. In fact, the revolutionary principle of discretionary conclusion of fact, which marked the end of the legal or weighted evidence in civil law jurisdictions, gradually evolved to practically eliminate all intersubjective rationality in fact-finding during the post-codification era. This development has been called "one of the most politically bitter and intellectually disappointing chapters in the history of criminal law institutions" (Ferrajoli, 2011, p. 139; Gascón, 2010, p. 34). In addition, regarding evidentiary issues, philosophical positivism had an impact on the development of continental procedural law, which was more focused on supporting a legitimate differentiation from substantive law, rather than on expanding its scope of study to engage with extra-procedural disciplines. As a result, procedural law approached evidentiary issues from an exclusively legal perspective, regardless of the contents developed by other fields, such as epistemology and philosophy. For instance, in evidentiary discussions, and maybe due to German influence, concepts such as conviction (Chiovenda, 1940, p. 205), subjective conviction and the persuasive effect of evidence, became central discussion topics. This was not because rationality was dismissed as irrelevant, but rather because factual reality was understood in ontological terms, an aspect that was not very significant on judicial matters. What truly mattered was the judge's capacity considering the limits to the judge's knowledge: a representation of the facts based

on evidence that would lead to the judge's conviction about what happened (Devis Echandía, 1970, p. 250). The ontology of factual truth, together with the influence of philosophical positivism within the law, contributed to a certain pejorative attitude towards the analysis and regulation of evidence within judicial procedures. For instance, the Spanish Criminal Procedure Law (LECrim) of 1882, entirely neglected to refer to means of evidence during the oral trial phase, focusing instead on the positive regulation of the investigation stage. In this regard, Prieto Castro (1976) indicates that the legislator "showed no real interest in addressing [evidence] within the corresponding jurisdiction, with the diligence required for such a critical matter for both the prosecution and the defense" (p. 215).

During this period, fact-finding issues were studied by natural sciences and were largely excluded from legal academic work. According to Guasp (1997), for instance, this shows the success of the formalist approach to procedural law, which prohibited the use of materials not derived from the legal system itself and resisted the influence from extra-legal disciplines. Thus, it was built "arbitrarily, being blind to reality" (Serra Domínguez, 1969, p. 353). Serra Domínguez warned us, in a study published in 1962, that "evidence is one the least studied subjects in the legal field" (1969). Nevertheless, he recognizes that it constitutes the very essence of the judicial process, influencing it to varying degrees throughout its entire course. This author, referring to the rigidity of procedural doctrine towards extra-legal issues, points out that Carnelutti (1982, pp. 3 ff.) "makes significant progress by bypassing a large number of philosophical problems that arise from the concept of truth" (p. 357). This may be explained by the fact that attention at that time was focused—as he indicated—on distinguishing it from the applicable substantive law, a tendency particularly evident in the treatment of evidentiary matters. According to Couture (1958):

> Civil law countries used to consider forms of evidence as a matter of procedural law, and their value or effectiveness as a matter of substantive law, as opposed as common law countries where all evidentiary matters are regarded as matters of procedural law (p. 258).

For instance, in Chile, the main rule on the burden of proof is written in article 1698 of the Chilean Civil Code (1855). Furthermore, it is possible to find legal provisions in the Chilean Criminal Code (1873, art. 369 bis) imposing the obligation to assess evidence according to sound judgement (logical and reasonable rules of evaluation and procedure) in sexual offense trials.

Carnelutti (1982), referring to this distance between procedural law and other disciplines, mentioned that there is only one truth—in relation

to the distinction between formal truth vs. substantial truth—and the process to search for it, constrained by procedural rules that often distort logical purity, cannot be considered as truth-seeking means. On the contrary, it is a way to establish facts that may or may not align with their actual truth, and thus it remains independent from them (p. 21). This view differs from the current—and larger undisputed—assumption that "searching for the truth" is the aim of the evidentiary stage of judicial proceedings. It also departs from the recognition of multiple concepts of truth (such as pragmatic, correspondence and consensual theories of truth, among others) (Kirkham, 1995, pp. 41 ff.), as reflected in the adoption of the logical probability approach within the framework of the rationalist theory of evidence rooted in the common law tradition.

In my view, it is important to distinguish between the teleological aspect of the search for truth—as the underlying purpose of the evidentiary stage—, and the conclusions reached, which are merely probable due to the limitations of judicial procedures and human knowledge in general.

Furthermore, the influence of Judeo-Christian tradition may have contributed to an overemphasis on formal Aristotelian-Thomistic logic. In fact, currently some legal practitioners keep explaining fact-finding decisions through the application of a syllogism, where the major premise is the legal rule, and the minor premise the set of facts whose subsumption is being discussed (Montero, 2011, pp. 598 ff.; Sentis Melendo, 1979, p. 21). This is often done without critically examining or justifying the descriptive assumptions underlying such logical structure. In this sense, the adoption of the syllogistic model may reflect a classical positivist conception (Priori, 2016, p. 178).

As we will see, within the Ibero-American context, the concept of sound judgement has a significant regulatory presence. It operates as a potential *tertium genuis* between the system of legal (or weighted) evidence and the system of discretionary conclusion of fact, with the obligation to respect to rules of logic as one of its key limits. If we assume that the judicial reasoning simply follows a syllogistic structure at the moment of decision-making, we would be adopting an overly simplistic view of what really happens when a judge reaches a verdict. I'm not saying that formal logic is not important in judicial reasoning, but rather that it is not the only perspective that has to be considered to describe such phenomenon. The picture changes if we understand the syllogistic structure as part of the conglomerate of rules that judges are bound to follow, in which case the descriptive nature of the formal logic fades into the background.

The principle of free appraisal of evidence in the late 20th century Germany deserves special attention. German scholars, who were not significantly influenced by the French revolutionary ideals of the

Enlightenment period (Benfeld, 2018, p. 317), developed a conceptual model aimed at limiting judicial discretion. This was done within a framework of freedom to assess evidence, perhaps as a way to counter the warnings about arbitrariness and subjectivism during the transition from a system of legally weighted evidence to one based on a free appraisal of evidence, especially considering the unreflective adoption of the jury system in the revolutionary France (Nieva, 2010, p. 79). Indeed, paragraph 261 of the Strafprozessordnung (hereinafter, StPO) recognizes the principle of the judge's free appraisal of evidence, though it simultaneously imposes constraints grounded in the rules of logic and experience (Gómez Colomer, 1985, pp. 51 ff.). However, as indicated by Roxin (2000), objective probability must be accompanied by the judge's subjective conviction (p. 104), a requirement that notably weakens the intersubjective rationality of the substantial decision. To my understanding, in Chile we have inherited the concept of "lessons of experience" and logic principles as limits on evidence appraisal in criminal law. In fact, some of these studies were translated to Spanish and became part of the cultural-legal repertory of Ibero American scholars. The following publications deserve a special mention: *El conocimiento privado del juez* (Stein, 1990) and *Tratado de las pruebas judiciales* (Mittermaier, 2002). Notwithstanding the above, this German movement seems to be isolated from broader epistemological and philosophical debates, particularly from those that were more relevant within the common law tradition. The German idealism played a significant role in this situation, as the prevailing approach in philosophical discussions during that time.

The words of Mittermaier (2002) seem to be very imprecise when viewed through the lens of the evidentiary rationalism of the common law tradition. He states: "Conviction becomes certainty from the moment it successfully rules out all the opposing reasons, or when the latter fail to undermine the compelling set of supporting reasons" (p. 36). The Spanish authors, Almagro Nosete and Tomé Paule (1994) —likely influenced by the Germans—argue that "procedural evidence seeks to persuade the judge either of the truth or the existence of a fact, or the falsehood or certainty of a statement" (p. 336).

III.3. The Barcelona school, Latin American procedural law practitioners and evidentiary rationality

The efforts of the so-called Barcelona school of Procedural Law also deserved a special mention. It made significant contributions on evidentiary matters at a time when such issues seemed to be neglected by the Ibero-American procedural doctrine. In this sense, Serra Domínguez (1969) observed that "evidence is one of the less studied in the legal sciences" (p. 353).

The work of Muñoz Sabaté (1967), associated to the Barcelona school, is one of the most influenced by the common law tradition within the framework of the Spanish procedural law at that time, and therefore is one of the most unconventional and forward-looking. Perhaps for this reason, it did not have the impact it should have had in Latin America. Muñoz Sabaté was one of the first Spanish—speaking authors to argue that legal studies on evidence should draw from other disciplines, such as psychology (pp. 20 ff.). These ideas where then followed by Nieva in the late 1990s (2007, pp. 61 ff.). The evidentiary studies of Muñoz Sabaté (2012), as he has indicated, are framed within an ongoing debate with the legal practice. He is also the first author using the terms "legal semiotics" or "science of circumstantial evidence", "evidentiary technique", "forensic evidence", etc. He describes forensic evidence as the study that "explores the transition of the fact from the moment it occurred (or even before) until it is represented and reconstructed in the court" (p. 19).

While the contributions of the Barcelona School, at the beginning of the second half of the 20th century, were praiseworthy and advanced for their time, there are aspects that should be observed from an epistemological point of view. For instance, though it is acknowledged that probability plays a significant role in fact-finding, it keeps on using the phrase "judge's conviction" to indicate the purpose of the evidentiary stage in relation to the facts (Serra Domínguez, 1969, p. 356). This is incompatible with an objective conception of evidence, in which fact-finding has to be motivated or reasoned, which means that factual justifications shall be provided, and these should be intersubjectively shared by all rational observers to make them intelligible. Therefore, seen through the lens of an "objective" rationality in fact-finding, it is not possible to accept—as Serra Domínguez does—that "it is not true that judicial conviction comes exclusively from evidence" (p. 376).

According to Sentis Melendo (1979), the structure of a judicial decision follows a syllogism, where the major premise is the legal rule, and the minor premise is the fact to be subsumed. This author opposes to the tripartite distinction among weighted evidence, sound judgement, and discretionary conclusion of fact, because he understands they refer to different issues: "sound judgement is a mean to reach conviction" (p. 21). Thus, fact-finding requires freedom. If a judge lacks freedom when appraising the evidence, one could not properly speak of a genuine fact-finding procedure (p. 242). In relation to the concept of sound judgement, Sentis Melendo points out that nobody has been able to define it: neither the legal doctrine, legislation, nor caselaw (p. 266). In his view, sound judgement is compatible with the principle of discretionary conclusion of fact, as it serves as a tool to reach a discretionary conclusion (free conviction) or a rational persuasion (p. 272). He also asks himself

whether the concept of sound judgement could be classified as a legal standard or indeterminate legal concept, and he rejects both options due to the longevity of the term under analysis as opposed to the more recent development of such legal categories (pp. 276 y 278). Indeed, this author warns us that we shall not think that the sound judgement concept is a procedural revolution. He refers that it is rather a perfect formulation of an unknown author that should be preserved as such. Furthermore, it is not a new label of the discretionary conclusion of fact, but rather a way of framing the issue from different angles:

> "sound judgement and cautious appreciation view the matter from the perspective of the means or the method; on the contrary, rational persuasion and, above all, discretionary conclusion of fact or free conviction, address it from the perspective of the objective or the goal to be achieved" (p. 281).

According to Couture (1958), the sound judgement concept is an intermediate category between the weighted evidence and the discretionary conclusion of fact. In this regard, he argues that it is nothing more than the rules of sound human reasoning (p. 270), encompassing both the rules of logic and the judge's experience. Thus, a judicial ruling should not ignore the principle of identity, the law of the excluded middle, the lack of sufficient reason or the principle of non-contradiction. The Uruguayan author acknowledges that a judicial decision may be formally correct from a logical standpoint, yet still incorrect if one of the premises assumed fails. In addition, lessons of experience contribute to evidence appraisal as much as logical principles. The sound judgement—besides being logical—is the right appreciation of certain propositions of experience which are used by all individuals (p. 272). He adds: "It is thus necessary, within the context of evidence appraisal, to consider both the inevitable variability of human experience, and the need to uphold -as firmly as possible—the principles of logic that underpin the law" (p. 273).

Regarding the concept of truth, Couture (1958) asserts that "the judge knows only the truth as told by the interested party, which constitutes a relative form of knowledge" (p. 49). Similarly, he indicates that evidence tries to prove the certainty of a fact or the truthfulness of a statement (p. 215). It is worth pointing out that Couture's stand on these matters has exerted a strong influence across Latin America, a fact clearly verifiable in Chile—as shown below—and in scholars from other countries (Cafferata, 1998, pp. 46 ff.).

Devis Echandía (1970), rejects the notion that a sound judgement approach constitutes an intermediate model between weighted evidence and the discretionary conclusion of fact (p. 98). Even though we are in the field of evidentiary freedom, this does not exempt judges from

applying the rules of logic, psychology, and technique, all guided by objective and social criteria. Despite the scientific quality of his work on evidence, he radically considers that the pursuit of truth cannot be the purpose of evidence within judicial procedures, "because the result of evidence can never fully correspond to the truth, even though it provides the judge with sufficient conviction to make a decision" (p. 239). Truth is an objective, ontological concept, whereas the judges' knowledge of the truth obtained through evidence is inherently subjective (p. 250). As a result, the Colombian author concludes that "the goal of evidence is for the judge to be convinced or to have certainty about the facts, which amounts to the belief that one knows the truth or that our knowledge aligns with reality" (p. 251). This approach assists judges in adopting decisions based on the facts. Though he considers that the syllogistic structure is important for evidence appraisal, he argues that it is not exhaustive, since the major premise incorporates rules of experience and the minor premise relies on inferences deduced from perceptions, which are always fallible. He also observes that evidence appraisal is not only an inductive-deductive operation (p. 294). Similar to Couture (1958), Devis Echandía (1970) considers that sound judgement is a legal standard; that is, "permanent and general criteria for the appraisal of judicial evidence, which are neither inflexible nor static, much like the lessons of experience" (p. 298). Perhaps this Colombian scholar is the more receptive to the idea that insights from other disciplines, such as psychology, can meaningfully contribute to fact-finding, going beyond vague references to the rules of human experience.

Jairo Parra (2007), in line with the abovementioned scholars, argues that judges must reach their conviction freely, considering the evidence and the sound judgement (p. 6). However, he openly recognizes that in all judicial procedures the truth must be seek (p. 32). He indicates: "Judges must assess the evidence through discursive reasoning, to account for what they do and decide" (p. 86). Regarding the principle of sufficient reason, he emphasizes the need for a cause capable of justifying both the existence of things and our knowledge of them (p. 106). He strongly highlights the role of reason as a critical tool for examining facts in the judicial procedure (p. 107) and, in fact, distinguishes between subjective and objective certainty, asserting that the latter is the one obtained in judicial procedures through evidence (p. 169).

III.4. Foundations uniting legal traditions: Insights from late 20th century Spanish legal doctrine

Though scholars of the civil law tradition were already aware of the inconvenience of understanding certainty as the outcome of evidentiary proceedings, it was only with the incorporation of the common law concept of evidence—strongly shaped by epistemology—

that they could accurately define what happens with facts in the judicial procedure. This integration was so successful that it gave rise to a boom in evidentiary studies in the early 21st century (Agüero, 2016, p. 83). For instance, legal scholars began revisiting the question of truth within judicial procedures (Dei Vecchi, 2014, pp. 237 ff.; Ferrer, 2007, pp. 29 ff.) and sought to establish clearer parameters of rationality for judicial decision-making by removing all traces of evidentiary subjectivism.

As a result, logical probability as an evidentiary reasoning option has come to be defined—largely—by how legal provisions are understood, by judicial reasoning practices, and by the application of the law to specific cases through a subsumptive process that requires judicial justification.

From a qualitative standpoint, in my personal view, the introduction of the logical probability approach into Spanish legal studies can be traced to the Spanish translation of *La prova dei fatti giuridici* originally published by Michele Taruffo in Italy in 1992. The first Spanish edition—translated by Jordi Ferrer—was released in Spain in 2002. Indeed, Taruffo's special theoretical-philosophical capacity was precisely what called the attention of Spanish-speaking legal theorists and/or philosophers, who have since successfully promoted this approach. It has already been incorporated into the evidence studies of several Ibero-American procedural law scholars and practitioners (Nieva Fenoll, Picó, Abel Lluch and Muñoz Sabaté, among others). Even though earlier authors already talked about factual induction and logical probability (Ferrajoli, 2011, pp. 51 and 53), in my point of view, it was the work of Pavía—due to its conceptual soundness and aesthetic depth—, that truly built a theoretical bridge between fact-finding models based on common law evidence theory, and contemporary Ibero-American approaches to evidentiary reasoning.

In the early 21st century, Spanish legal doctrine on evidence started approaching to the *new evidence scholarship* under the label of rationalist theory of evidence. Jordi Ferrer (Taruffo's translator) founded a research group on evidentiary law at the University of Girona. This institution became a significant training ground for numerous Latin American scholars, many of whom have a strong orientation toward the philosophy of law. They have produced a significant number of studies on this matter in Spanish. In parallel, other Spanish legal philosophers have published studies on evidence with a great impact in Latin America. For instance: Daniel González Lagier (2003a, 2003b), Juan Igartúa Salaverría (2003, pp. 7 ff.) and Perfecto Andrés Ibáñez (1992, pp. 257 ff.; 2015, pp. 251ff.), among others. In addition, a great number of foreign works supporting this approach have been translated. Among the most relevant are: *Análisis de la prueba* by Anderson *et al*. (2015), *Verdad, error y proceso penal* by Laudan (2013), *Elementos de epistemología del proceso judicial*

by Ubertis (2017) and a substantial number of Taruffo's works (2008, 2009, 2010).

Indeed, the shift towards a common law-inspired approach was most clearly articulated by legal theorists. They produced major conceptual and systematical works, as compared to what had already been written. It is worth emphasizing that these works were strongly influenced by epistemology, yet they distanced themselves from the conceptual framework of the classical Germanic procedural law due to its rigidity and self-sufficiency in relation to evidentiary issues.

The following works are a good example of what was mentioned above: *La valoración racional de la prueba* by Jordi Ferrer (2007) and *Los hechos en el derecho* by Marina Gascón (2010), both legal philosophers. An exception to this trend is found in the works of Spanish procedural law practitioners, such as *La valoración de la prueba* by Nieva (2010) and *El juez y la prueba* by Picó (2008). Though these authors are not legal theorists they incorporate elements from the common law tradition with a strong procedural tendency. Picó, for instance, has translated to Spanish works by Damaška (2015, pp. 15 ff.), such as *El derecho probatorio a la deriva*. Similarly, Xavier Abel Lluch (2015), in *Las reglas de la sana crítica* presents the traditional procedural principles before introducing the concept of logical probability.

In my opinion, Ibero-American scholars, who currently write about evidence, have embraced the logical probability approach on evidentiary matters, and are increasingly open to deeper conceptual and systematic refinements in fact-finding developments, clearly influenced by other disciplines, such as epistemology. As we will see below, this trend is also evident in Chile.

IV. LOGICAL PROBABILITY IN CHILEAN CRIMINAL LAW

IV.1. Legal doctrine

Evidentiary research in the Chilean legal literature has primarily focused on the Chilean Code of Criminal Procedure (hereinafter CCP), which came into force in 2000. The CCP features a structural design that closely resembles the criminal justice systems of common law countries, while simultaneously incorporating institutions of the civil law tradition (Vera Sánchez, 2017, pp. 141 ff.). Evidentiary provisions in the CCP reflect this interaction between the two legal traditions. For instance, article 340 of the CCP explicitly adopts the "beyond a reasonable doubt" standard. Furthermore, articles 259 and following regulate an intermediate (pre-trial) stage, which main purpose is assessing the admissibility of evidence, through a debate on the exclusion of

evidence, particularly that which may have been obtained unlawfully. The trial stage, in contrast to the pre-trial stage—overseen by a *juez de garantías* (supervisory judge)—, is conducted by a tribunal. It is during this stage that the CCP outlines the evidentiary appraisal method under the section "General Provisions on Evidence":

> Art. 295.- Freedom of evidence. All relevant facts and circumstance necessary to appropriately resolve the case under prosecution, may be proven through any means of evidence, provided they are produced and incorporated in accordance with the law.

Likewise, article 297 provides:

> Article 297.- Assessment of Evidence. Courts shall assess the evidence freely, but without contradicting the principles of logic, lessons of experience, or scientifically supported knowledge. In its legal reasoning, the court must address all the evidence presented, even that which is ultimately dismissed, explicitly stating the reasons for its exclusion. The evidentiary assessment within the judgement must indicate of the means of evidence by which each fact or circumstance was established. This legal reasoning must enable a reconstruction of the logical process that supports the conclusions reached in the judgement (CCP, 2000).

Chilean scholars have focused their research on the analysis of these two legal provisions, especially the latter, which gathers the essential principles for the appraisal of evidence.

Horvitz and López (2004) define fact-finding procedures as "means to verify the factual propositions brought before the court by the parties" (t. II, p. 131). Regarding the form or method of such verification, the CCP establishes a rational sound judgement system. This model departs from the weighted evidence system, "and instead it imposes a duty on the judge to justify the decision by explicitly stating the reasons behind it, which shall in no case contradict principles of logic, lessons of experience or scientifically supported knowledge" (t. II, pp. 129). These constraints are closely tied to the possibility of challenging such decision, allowing for intersubjective control through the appeal regime, even though—strictly speaking—factual determinations based on evidence are made at a single procedural instance.

Maturana and Montero (2017) describe evidence appraisal as the determination of facts based on the evidence submitted. These authors consider that the sound judgement approach serves as a mechanism to control judicial reasoning, ensuring it operates as a rational process grounded in legitimate evidence. In this regard, they add that "the judge's conviction must be supported by arguments that are rationally connected, in accordance with the principles of human thinking (i.e.,

logical principles: identity, non-contradiction, excluded middle, and sufficient reason), psychology rules and common human experience" (t. II, p. 1192).

Paillás (2002) argues that article 297 of the CCP introduces or accounts for "a judicial reasoning based on a deductive syllogism" (p. 21), where the major premise corresponds to the lesson of experience, the minor premise to circumstantial evidence, and the conclusion is reached through logical reasoning and experience (p. 21). Correa (2007) characterizes article 297 of the CCP as establishing an intermediate model between the weighted evidence system and the discretionary conclusion of fact. He calls it the sound judgement system (p. 289). According to Correa, judicial motivation has a fundamentally logical nature rooted in the pursuit of certainty. Thus, "the judge must adhere to the supreme logical principles or "supreme laws of thought", that govern reasoning and provide a sound basis for determining which facts or statements are necessarily true or false" (p. 293). These principles include: the principle of identity, the principle of non-contradiction, the law of the excluded middle, and the principle of sufficient reason (p. 293), thus using an approach similar to the one used by Couture in these matters. Regarding the principle of sufficient reason, judicial reasoning must be built upon "reasonable inferences derived from evidence, along with the corresponding conclusions logically inferred from it" (p. 294). From this perspective judicial motivation will be deemed sufficient when it is comprised by elements capable of reasonably generating "actual or probable conviction of a fact, due to its quality" (p. 295).

According to Cerda (2019), courts assess evidence freely, but without contradicting the principles of logic, lessons of experience or scientifically supported knowledge. Though this author—following the work of Gascón and Taruffo—is among the few Chilean scholars directly speaking of logical probability and Popper's principle of indeterminism, his epistemological assumptions are not very accurate. Cerda asserts that judges must also consider "the rules of formal logical thinking, which are permanent and invariable, regardless of any possible world" (p. 484). This view stands in direct opposition to Bunge's thesis (2005), which maintains that the philosophy of logic is fallible, and subject to subsequent revisions, in order to better adapt to real, new and unpredictable inferential mechanisms (p. 67). If formal logic is deemed as the dominant element in evidentiary appraisal, there is a risk of building a wall based on deduction. And, while deduction is important for ensuring internal consistency in judicial reasoning, it fails to explain the mechanism by which factual premises are established, what Wroblewski (1989) calls "external justification" (p. 40). The approach grounded in logical or inductive probability does provide an account for the latter. Thus, on the one hand, there are no reasons to interpret the

legislator reference to "the rules or principles of logic", as exclusively referring to classical or formal logic; and, on the other hand, the purpose of these rules is not to provide information about the world, but rather to guide the correct reasoning, defined by the boundaries it must abide by (Agüero & Coloma, 2014, p. 682).

Cerda (2019), using Couture words, affirms that respecting the rules of logic entails adherence to the following fundamental principles: a) the principle of identity, b) the principle of non-contradiction, c) the principle of sufficient reason and d) the law of the excluded middle (pp. 484 ff.). Out of them, Cerda—aligned with Esser—understands the principle of sufficient reason as follows: "every judgement requires a sufficient reason to be true" (p. 487).

According to Chahuán (2012), the purpose of evidence in the modern criminal procedure is to ensure that the account of what happened aligns as closely as possible with what actually happened (p. 360).

Accatino (2009), a legal practitioner with a background in legal philosophy, observes that—strictly speaking—evidence appraisal "designates the specific empirical support provided by the items of evidence to the competing hypotheses, both individually and collectively" (p. 351). She furthers emphasizes that "it is the moment to establish the corroborating logical relations between the factual propositions to be proven and the available items of evidence" (p. 359). In this sense, the author adds that "asserting that a proposition has been proven, must necessarily mean asserting something about the items of evidence presented to the court" (2006, p. 48), which also means admitting a reasoning and critical assessment of evidence. Furthermore, this author acknowledges the significance of an evidentiary model based on a hypothesis confirmation framework, explicitly citing the essential work of Cohen (p. 50). Similarly, the work of Jonatan Valenzuela (2017) stands out. In his book *Hechos, pena y proceso,* he refers he explicitly endorses the so-called "rational theory of evidence" and its projections (p. 13).

As explained above, Chilean doctrine regarding criminal evidence reflects an oscillation between, and incorporation of, elements of the logical probability approach derived from the common law tradition and the procedural law studies on evidence rooted in the civil law tradition. While such integration is not yet as fluent as it could be (the term "conviction" is still being used), there are growing signs of interaction between the two legal-evidentiary cultures. For a group of procedural law scholars, the principles of logic remain paramount, to such an extent that sometimes their apparently self-denotative character when they are applied to the facts can obscure the nuances introduced by the logical probability model. However, inductive probability appears in more recent literature and, perhaps, with

a stronger influence of the philosophy of law. As explained below, case law also accounts for this interrelation reported in the literature.

IV.2. Recent developments of criminal case law

A first introduction of the local probability model in case law can be found in the assumption that evidentiary appraisal must enable intersubjective control of judicial decisions. This is achieved through the explicit statement of motives, thus allowing a reconstruction of the reasoning behind the decision's conclusions. Specifically, case law has pointed out that the grounds for a decision must be clear, logical and account for all the facts deemed as proven, whether they support the defendant's stand or not. Such reasoning must include the assessment of the means of evidence that support those conclusions, in accordance with the provisions of article 374.e, article 342.c and article 297 of the Code of Criminal Procedure (*Public Prosecutor v. Yuvemir Gutiérrez Silva and other*, 2021).

In this regard, particularly referring to article 297 of the CCP, case law establishes that the reasoning must reflect "a logical process that can thoughtfully lead to the conclusion" (*Public Prosecutor v. José Arce Fernández*, 2021). This has been also called "the autonomy of judicial decisions"—or self-sufficiency—, meaning that a reader should "be able" to logically reach the same factual conclusion as the court, by following its reasoning, regardless of whether they agree with it or not (*Public Prosecutor v. Javier Yáñez Soto*, 2020). The aim of such reasoning is both making the decision understandable and ensure that "the factual premises of the ruling have been defined through a previous rational process" (*Public Prosecutor v. Jorge Andrés Ríos Arredondo*, 2020). This work aims to verify—with the available evidence—a specific factual conclusion that has been proven beyond a reasonable doubt (*Public Prosecutor v. Juan Ramírez Andrades and others*, 2019).

Case law has also established that the logical nature of the appraisal of evidence is grounded on the principles of the formal Aristotelian logic (*Automotores Gildemeister S.A. v. Automotores Gildemeister S.A.*, 2015; *Public Prosecution v. Daniel Gervasio Riquelme Reyes*, 2020).

In my view, the connection with the logical probability model becomes especially clear in the application of the principle of sufficient reason during the evidentiary assessment. Indeed, it is considered an element derived from the constraints imposed by the sound judgement requirement. In this regard, the principle of sufficient reason stems from the fundamental rule of derivation (*Public Prosecutor v. Eduardo Varas Arriaza*, 2019; *Samuel Carvallo Véliz v. OGM Maestranza and Abastecimientos S.A. and others*, 2019).

Wilhelm Leibniz (2014, p. 20), describes the so-called principle of sufficient reason as the idea that no true or actual fact or statement exists without sufficient reason for its being, though such reasons may sometimes remain unknown (*Public Prosecutor v. David Andrés Pérez Pérez*, 2019). Case law seems to assume, as shown below, that such sufficient reason refers to proving the facts using available evidence through a logical inductive reasoning that enables the fact-finding outcome. That is, the fact-finding process cannot rely solely on the existence of evidence, or on mere formal-logical derivations between evidence and facts. Rather, it requires determining and justifying the epistemic strength of the connection that joins them, and that way a fact will be deemed as proven. It is worth highlighting the similarities this has with Cohen's provability thesis explained above.

The principle of sufficient reason serves as "a guideline for assessing the consistency of the evidentiary process, considering that 'no statement can be true without a sufficient reason for it to be so, and not otherwise'" (*Public Prosecutor v. Carlos Arriagada Díaz*, 2019). This refers to a rational exercise to determine the truth of propositions, requiring evidence to be able to support only certain specific conclusions and rule out others (*Public Prosecutor v. Alejandro Taffo Taffo*, 2020).

The Supreme Court interprets the logical principle of sufficient reason stating that "any statement or proposition affirming or denying a fact, which must be supported by reasons that sufficiently corroborate it" (*Automotores Gildemeister S.A. v. Automotores Gildemeister S.A.*, 2015; *Plásticos Técnicos S.A. v. Internal Revenue Service*, 2016). From this perspective, investigating the violation of this principle, involves identifying the fact that is deemed as proven in the judicial decision, and specify the statements or proposals supporting this determination, which must be grounded on sufficient reasons to prove it, so as to ensure compatibility with a rational structure, in which the "consequence" necessarily derives from its "precedent" (*Public Prosecutor v. Johans Soto Urra*, 2020; *Public Prosecutor v. Juan Ramírez Andrades and others*, 2019).

Case law has observed that the principle of sufficient reason requires both that factual findings are supported by evidence (*Public Prosecutor Félix Mansilla Catalán*, 2020) or that the ruling includes a rationale that support that factual decision in a rationally acceptable way (*Public Prosecutor v. Camila Becerra Muñoz*, 2020; *Public Prosecutor v. Cesar Hernández Salazar*, 2020). It is definitively a rational justification of the factual decision (*Public Prosecutor v. César Hernández Salazar*, 2020; *Public Prosecutor v. Sergio Maulén Tenderini*, 2019), which enables controlling the factual basis that supports the decision (*Public Prosecutor v. Osorio San Martín and others*, 2020). This same principle is the one that determines that the judges hearing the case must support

their conclusions in a way that rules out any reasonable doubt (*Public Prosecutor v. William Cuero Chala*, 2020).

The principle of sufficient reason has also been associated to the idea of evidentiary corroboration derived from logical probability, in the sense that the propositions put forward by the court must be supported or corroborated with other autonomous and diverse evidence (*Public Prosecutor v. Cristian Saavedra Sepúlveda*, 2020). Thus, it is about identifying the substantial grounds necessary to prove the facts in the terms described (*Public Prosecutor v. Carlos Leiva Arancibia*, 2020).

In this sense, the evidentiary interpretation of the principle of sufficient reason is understood as the epistemically correct approach, aiming at preventing judges to rely on mere subjective certainty (*Public Prosecutor v. William Cuero Chala*, 2020). Thus, this logical principle requires a degree of ratification, whereby the hypothesis supporting the indictment "must be—above all—confirmed by a plurality of evidence or evidentiary data, connecting this evidence with the hypotheses, so as to determine its truthfulness" (*Public Prosecutor v. Alejandro Taffo Taffo*, 2020).

Furthermore, there is case law that goes beyond this argument, and even quotes Taruffo (2009) when referring to evidentiary reasoning:

> It is worth noting that evidence plays an epistemic role, because it is a procedural tool enabling the judge to discover and understand the truth about the facts of a case. More precisely, evidence is the tool that provides the court with the necessary information to establish factual assertions that are supported by a sufficient and appropriate cognitive basis to be considered truthful. Thus, evidence has a rational duty, as it is produced within a rational knowledge process and is aimed at determining the truth of a fact or statement, based on a rational justification (*Public Prosecutor v. Dagoberto Arturo González González*, 2020).

The Court of Appeal of Arica explicitly connects the principle of sufficient reason with the inductive evidentiary reasoning of logical probability:

> In order to find the sufficient reason of a factual conclusion, one must analyze the evidence supporting the propositions or providing them with substantial grounds. As a consequence, the court's evidentiary reasoning—of an inductive nature—must be comprised by inferences properly drawn from the evidence submitted by the parties and must derive from successive conclusions that are supported by such evidence. Furthermore, the reasoning must be coherent and restrictive, in relation to each positive or negative conclusion and respond properly to an element of conviction from which the conclusion can be derived. Finally, the supporting evidence must be sufficiently strong to really uphold

> the conclusion, ruling out any other alternative (*Public Prosecutor v. Elizabeth del Carmen Gajardo Díaz and others*, 2010).

Likewise, the Court of Appeals of Coihaique indicates that "to consider a proposition as completely true, it has to be proven, which means that the judge must know sufficient reasons that justify the truthfulness of such proposition" (*Public Prosecutor v. Jusmery Toledo Rojas and other*, 2021). Once again, it is striking to note that the court used Cohen's term (provability).

V. A TEMPERED RECEPTION OF LOGICAL PROBABILITY IN CHILE? LIGHTS AND SHADOWS

For all the reasons discussed above, I believe Chile has been quite fortunate. The coexistence of both an understanding of evidentiary freedom within the parameters imposed by the sound judgement, as well as the incorporation of logical criteria that seem to correspond to the scope of external justification of judicial decisions, has allowed for a *sui generis* application of logical probability in evidentiary matters. Both legal doctrine and case law show an interaction between the civil and common law approaches to the appraisal of evidence, suggesting perhaps that concepts of logical probability are gradually being incorporated into civil law system ("continentalization»). While this development is marked by numerous inconsistencies, the overall trend is clear.

It makes sense to ask whether it is appropriate or not to regulate evidentiary appraisal—even if only to establish boundaries—, giving that it is highly context-dependent. Damaška (2015) argues that, "establishing rules on a subject that is so dependent on context, is like enacting laws against a chameleon because of its color" (p. 38). Neither the Chilean legal system nor any other should tolerate reliance on random circumstances to correctly introduce epistemological elements to address evidentiary matters in judicial decisions. It is unjustified, at least from its origins, to redirect the principle of sufficient reason toward the epistemic mechanism that allows considering a fact as proven. Doing so compromises the syntactic richness of logical principles, which serve as a boundary to the concept of sound judgement, introduced in article 297 of the CCP. In fact, both case law and legal literature frequently misinterpret the principle of sufficient reason, which was an issue already warned by Russel (2010), who observed: "What exactly Leibinz meant by the principle of sufficient reason remains uncertain" (t. II, p. 243).

In addition, from a formalist point of view, there arises a legitimate doubt about the *preater legem* nature of the courts' interpretation of the principle of sufficient reason. This interpretation is often based on an

assumed historical certainty that, in reality, is not so certain, frequently supported only by a superficial reference to Leibniz, without exploring the context in which he made such assumptions.

Indeed, even though case law often refers to the process of confirming or corroborating facts, their provability and inductive nature, often under the principle of sufficient reason, in my view these references show a clear influence of the logical probability approach.

Historically, it is not possible to assert that Leibniz referred to these elements in his original proposal, because—among other reasons—of the temporal distance of nearly three centuries, and the meaning of the principle of sufficient reason in this philosopher's work. Given the vagueness of the notion and the need to rationalize factual justification in judicial decisions, case law has provided meaning to the abovementioned principles with elements that align closely with Cohen's theory of logical probability. The decisions cited above refer not only Taruffo's works (who uses the logical probability approach), but also concepts and phrases that clearly refer to it, e.g., "facts must be *proven*"[6], "inferences duly derived from the means of evidence", the requirement that the indictment hypothesis "must, above all, *be confirmed* by a set of evidence or evidentiary data, connecting such evidence with the hypothesis to determine its truthfulness"[7], etc.

The logical probability—rooted in the common law tradition—, and its introduction into Chilean evidentiary case law—as shown above—, is also an allegation against extreme formalism, which is most strongly observed in the school of proceduralism. Together with the logical probability, we have imported a legitimate claim for a procedural law that is more receptive to extra-legal disciplines, such as epistemology. This, in turn, opens up greater possibilities for engaging citizens in understanding inner and/or structural aspects of the criminal procedure. In fact, Cohen's elegant treatment of the complex question of how to determine that a fact has been proven offers an implicit invitation to make judicial topics and debates understandable for all. Thus, common sense should not be seen as a vulgarization or lack of seriousness in the field, but rather as a valid component of evidentiary reasoning, one that is duly justified and independent of a judge's personal experience. This perspective also reflects the influence of the common law concept of evidence, recalling a criminal justice system where trials were conducted before a jury, a fact that—directly or indirectly—shapes a great part of the evidentiary debates in that legal tradition. We should also be aware of this influence, since factual reasoning is not only a defining feature of our civil law tradition (Igartúa, 2013, p. 21), but also a fundamental

6 Emphasized by the author.
7 Emphasized by the author.

aspect of justice, since it ensures the intersubjective control of factual findings, particularly in light of the severe consequences that may result from a criminal conviction.

The way in which logical probability has been introduced into the civil law system through the "sound judgement" concept, responds precisely to the vagueness of this term (Benfeld, 2013, p. 571), as well as to its indisputable—and maybe problematic—Hispanic-American origin (Devis Echandía, 1970, p. 105; Nieva, 2010, p. 88 ff.; Parra, 2007, p. 100; Sentis Melendo, 1979, p. 259). This concept has different names in other parts of the world, and it seems to indicate a judicial action standard. In my opinion, the choice to adopt the term "sound judgement" reflects how our legal tradition addresses the epistemic dimension of facts, which necessarily leads us to the logical probability, if we assume that the epistemic approach is the most suitable framework for understanding the facts within the criminal procedure. In a way reminiscent of Enlightenment philosophy, the "logic" of logical probability is gradually overtaking the legal concept of sound judgement, just as "factual logic" once replaced religious explanations of the study of nature and human beings.

Although the concept of sound judgement is intended to provide a rational framework to evidentiary assessment, its vagueness may lead to subjective interpretations of evidence. This risk is mitigated under the logical probability approach, which offers greater conceptual clarity and systematic coherence. This has also difficulted to acknowledge that the logic nature of fact-finding decisions can only be explained according to the rules and principles of the formal Aristotelian logic, as opposed to what happens with the sound judgement model, as we mentioned above based on case law.

Nonetheless, both logical probability and the sound judgement reflect a common underlying need in both legal traditions: the need to rationalize factual determinations, so that the judicial decisions align as closely as possible with what actually occurred. Furthermore, as shown in this study, although the two approaches follow different paths, they are by no means irreconcilable.

Chilean legal doctrine and case law suggest that it is possible to introduce—perhaps in a tempered manner—a logical probability approach through the limitations of the sound judgement concept, and how these concepts—despite originating from different traditions—, share similarities and illustrate a process of legal transfer. The convergence between the logical probability and the sound judgement approaches in Chilean legal literature and case law show the strong influence of the common law tradition on evidentiary studies, and that Latin American criminal justice systems are open to receive concepts from the common

law tradition. In this sense, such reception can be beneficial, provided that it enhances the protection to fundamental rights within Ibero-American criminal justice systems. However, it may also be problematic if we don't acknowledge internal issues of imported institutions, or when their application undermines essential principles of the civil law traditions in our criminal procedures. Some authors have already indicated that the concept of logical probability is ambiguous (Abel Lluch, 2015, p. 76).

In my view, logical probability, as the prevailing evidentiary approach for determining the facts in a judicial decision, significantly enhances fact-finding outcomes, as it justifies the factual propositions by establishing a dialogue between procedural law and epistemology. Thus, it certainly supports the development of judicial decisions that are both intersubjectively controlled and more accessible to the citizens. A telling sign that this is happening, is that legal doctrine and case law are gradually abandoning the term "conviction", which is a term derived from evidentiary studies of procedural law in the civil law tradition during the late 20th century, as mentioned above. In this regard, the search for the truth and the objective understanding of evidence stand as indications of justice in the factual analysis of criminal decisions.

While sound judgement approach has followed the same path of "rationalization" within procedural law, it has not achieved the same success, because the concept can change through its interaction with other fields of study, even though it is informed by practical experience and, at times, by theoretical sources. In this regard, Mittermaier (2002), in his pursuit of a rational foundation for fact-finding decisions, understood that such reasoning had to be articulated through the concepts of conviction and certainty. In this regard, he argued: "The outcome of a judicial decision is clearly subjective" (p. 34). In my view, however, the subjectivity implied by Mittermaier—despite his rationalist intentions- cannot be accepted in modern criminal justice systems, especially considering the severe consequences of a conviction sentence, with imprisonment representing the hardest limitation of individual fundamental rights that the State can legitimately and coercively impose in response to criminal conducts. Thus, the logical probability approach, grounded in an objective conception of evidence, is more closely aligned with the legislative intent behind the incorporation of the "beyond a reasonable doubt" standard as a way to prevent wrongful convictions (Laudan, 2013, pp. 59 ff.), because it is better that the guilty goes free than that the innocent is punished. While the threshold for determining when this standard is satisfied remains unclear in practice, the evidentiary rationality approach unquestionably advances the objective control of the factual justification in judicial decisions.

Although in Germany conviction was never understood as mere subjectivity (Nieva, 2010, p. 79), the logical probability approach—rooted in the common law tradition—shows the advantages of adopting an objective conception of evidence. This helps to ensure that evidentiary rationality is not reduced to a vague judicial action standard that must be met. This does not mean that indeterminate legal standards or concepts shall not be applied in general law or in the criminal procedure in particular. Rather, it underscores the inconsistency and danger of allowing a criminal justice system that claims to protect citizen freedoms[8] to restrict or deprive such freedoms through an evidentiary assessment understood as a judicial action standard. It is particularly problematic when these standards are treated as binding legislative imperatives despite their indeterminacy, imprecision and susceptibility to subjective interpretation. As Hume (2018) points out: "Even if all human beings believed that the sun moves and the Earth remains still, all the reasoning that leads to this conclusion would not make the sun move an inch, and the conclusion would remain forever false and wrong" (p. 134). From this perspective, even when legislators bind criminal evidentiary appraisal to the regulatory corset of sound judgement as a judicial action standard, applying an intersubjective rationality grounded in coherent epistemological principles—such as those offered by the logical probability model—will provide better results.

The interaction between the logical probability and sound judgement approaches, which is already evident in Chile, reflects a clear interest in reforming evidentiary matters in criminal procedures. It also highlights the need to reinstate the Enlightenment ideal that has long been neglected in the evidentiary discourse: that facts should prevail over the judge's personal beliefs or experiences, and that evidence should be observed through the lens of extra-legal disciplines, such as contemporary epistemology. It is no longer acceptable to tolerate criminal procedure laws on evidentiary matters that remain "blind" to insights from other fields of knowledge.

On one hand, law is culture, and culture is a product of historical and evolutionary experience. On the other hand, *civil law* and *common law* traditions do not represent two contradictory views of law, but rather two different ways of reflecting on the legal phenomenon (Couture, 1948, pp. 10 y 15). The path already taken in on criminal evidentiary matters in Chile may well serve as an example of the cultural interaction

8 For instance, article 5 of the CCP (2000) states: "Legal validity of measures depriving or restricting freedom. No person shall be summoned, arrested, detained, subject to preventive imprisonment, or otherwise deprived or restricted in their freedom, except as established in the Constitution and the laws. The provisions of this Code, authorizing to restrict the defendants' freedom or other rights, or limiting the exercise of their powers, shall be narrowly interpreted and shall not be applied by analogy".

envisioned by this great Uruguayan scholar of criminal procedure. I hope that the dialogue between the common law and civil law traditions consolidates—perhaps not in the immediate future—, bringing together all our intellectual resources to reach increasingly fair criminal decisions, especially in fact-finding matters.

VI. CONCLUSIONS

This study aims at offering a positive response to concerns regarding the influence of the logical probability approach—rooted in the common law tradition—on evidentiary matters in the Chilean criminal justice system, considering that our legal system—despite the influence received from the common law criminal procedure—remains within the framework of the civil law tradition. While this may initially appear to be a merely academic discussion, it is not. In fact, a classical—and perhaps arbitrary—view continues to oppose the fact-finding models developed within the common law and civil law traditions. With this work I also wanted to criticize such stand, showing that both legal scholarship and case law have clearly introduced the principles of the logical probability approach within a system whose main rules on evidence are defined by the concept of "sound judgement" and its requirements. This indicates a process legal transfer of the common law understanding of evidence.

Indeed, Chilean doctrine and case law frequently use phrases such as: "the facts must be *proven*", "inferences duly derived from the means of evidence", the requirement that the indictment hypothesis "must, above all, *be confirmed* by a set of evidence or evidentiary data, connecting such evidence with the hypothesis to determine its truthfulness", etc. These phrases show elements of the Baconian or logical probability approach, even though they are often imprecisely or inconsistently applied under the label of the sound judgement principle.

All of the above should not come as a surprise, considering the abundance of evidentiary studies in the Ibero-American legal literature, which are currently oriented towards a gradually greater conceptual depth and systematic development. In this regard, and reinstating the Enlightenment ideal, the factual logic and logical probability are gaining prominence in criminal evidentiary theory, even influencing the Ibero-American concept of sound judgement. This influence can be explained, as discussed earlier, by a greater cognitive openness of this concept to insights from extra-legal disciplines. And this certainly allows for broader intersubjective control of fact-finding decisions, precisely because judges can use inputs from other fields, such as epistemology and psychology, which employ rational and objective methodologies to create knowledge. This scenario presents challenges, such as the

observation that the logical probability concept can be as vague as the sound judgement one. However, when the conceptual framework derived from logical probability is integrated, it provides much better conditions for the intersubjective control of the fact-finding decision, as compared as what judges previously relied upon. Furthermore, this also promotes a dialogue between criminal evidentiary theory and other fields of study, or an openness to extra-legal disciplines, such as epistemology.

In my view, justifying fact-finding in criminal justice matters must meet high standards to control its rationality through the clear judicial reasoning or motivation. Because a criminal conviction deprives or restrict individual freedom, it is necessary to remove all traces of subjectivism in order to ensure that a finding of guilt is not grounded on ana evidentiary appraisal process conceived as a judicial action standard. This way, the logical probability approach appears more compatible with the protection of individual freedom, and the exceptional restriction thereof through a judicial decision that can rationally justify why a fact has deemed proven and is criminally attributable to a specific person. Moreover, as stated above, logical probability also plays a role bringing judicial reasoning closer to the "real world", since the structure of the inductive reasoning presented hereof (Cohen's thesis) is not a detached scientific product, but rather reflects the way ordinary people understand the world through causal relations and empirical data supporting it. And this feature is more clearly embedded in the understanding of evidence rooted in the common law tradition than in our civil law criminal justice systems.

Evidentiary appraisal in criminal procedures is freedom. The sound judgement approach offers a framework for rational decision-making, while the logical probability approach responds to the strong need for this rationality to be deep as deep as possible. Therefore, though these approaches differ and originate from different legal traditions, they share a common aim, which confirms that the opposition between both notions and legal cultures are artificial rather than real.

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