



# Epistemology applied to conclusions of expert reports



Jose-Juan Lucena-Molina

Statistics' Department of the Criminalistic Service, General Directorate of the Civil Guard, Guzman el Bueno st. 110, Madrid, Spain

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## ABSTRACT

It is believed that to build a robust reasoning logic to make probabilistic inferences in forensic science from a merely mathematical or logistical viewpoint is not enough. Mathematical logic is the positive science of reasoning and as for that it is only interested in the positive calculus of its validity, regardless any prior ontological assumption. But without a determined ontology and epistemology which imply to define the concepts that they will use, it seems difficult that the proposed scientifically correct mathematical solution be successful as a European standard for making conclusions in forensic reports because it has to be based on judicial language.

Forensic experts and Courts are not interested in the development of a positive science but in a practical science: in clarifying whether certain known facts are related to a possible crime. Therefore, not only the coherence of the demonstrative logic reasoning used (logic of propositions) is important, but also the precision of the concepts used by language and consistency among them in reasoning (logic of concepts).

There is a linguistic level essential for a successful communication between the forensic practitioner and the Court which is mainly related, in our opinion, to semantics and figures of speech. The first one is involved because words used in forensic conclusions often have different meanings – it is said that they are polysemic – and the second one because there is often metonymy as well. Besides, semantic differences among languages regarding words with the same etymological root add another difficulty for a better mutual understanding.

The two main European judicial systems inherit a wide and deep culture related to evidence in criminal proceedings and each of them has coined their own terminology but there are other two more abstract levels such as logical and epistemological, where we can find solid arguments by which terms used at legal level on conclusions of forensic reports could be accurate and consistent for all users of an intended EU guideline. An effort has been made to elucidate the following terms: truth, certainty, uncertainty, opinion, conjecture, probability, evidence, belief, credibility, determinism, indeterminacy, cause, principle, condition, and occasion.

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## 1. Introduction

The development of a specific technical guide on evaluative forensic conclusions [1] has emphasised the need for using a glossary of terms acceptable both by two very different judicial systems in Europe, the Continental and the Anglo-Saxon ones, and by the special characteristics of the coexistence of so many languages in it. Terminological differences based on philosophical viewpoints were noted during the development of the project. These differences justify important semantic changes in words of current languages derived from the same Latin or Greek words as evidence, uncertainty, doubt, certainty, truth, probability or proof,

which have an unquestionable importance when defending an expert report before the Court.<sup>1</sup>

<sup>1</sup> Though R. Allen [2, p. 71] states that: "The standard critique assumes or asserts that an important goal of the legal system is to admit or take advantage of scientific knowledge, and then descends into the seemingly endless (to the not-so-philosophically minded) wrangling over what is knowledge and how we can know that we possess it", in our view, this comment is a consequence of the predominant 20th century Anglo-American theory of knowledge in the Anglo-American legal system (see Sections 2.1 and 2.2). Therefore, we think that R. Allen deals with a specific problem of the Anglo-American legal world. The philosophical discussion on the true concepts of knowledge and belief, and the application of the Anglo-American epistemology within the criminal proceedings of Continental legal systems simply doesn't exist (see J.J. Lucena-Molina, V. Pardo-Iranzo, J. Gonzalez-Rodriguez, Weakening Forensic Science in Spain: From Expert Evidence to Documentary Evidence, The legal and scientific status of forensic evidence in Spain, J Forensic Sci, 57 (4), 2012).

E-mail address: [jjlucena@guardiacivil.es](mailto:jjlucena@guardiacivil.es).

If many forensic experts have emphasised the relevance of a closer scene of crime inspection they should spare no expense with the expert report conclusions. Undoubtedly, this last assertion is still being a target without our reach in Europe, although the appearance of the publication of a technical guide on evaluative conclusions lays the foundations for a paradigm shift in forensic science that some authors have described as the most important consequence of the advances made by that science in the 20th century [3].

According to general legal doctrine about criteria for interpretation of legal texts, the grammatical meaning of legal texts is the starting point to interpret any norm. However, it is also important to bear in mind the context in which those terms are used, which is known as the logical or systematic criterion. Both criteria, grammatical and logical, are mutually involved in our case. Therefore, legal terms used in laws of criminal proceedings or analogue regulations need to be understood by procedural actors respecting those criteria unequivocally.

Philosophical considerations are present in Bayesian literature applied to Forensic Science. One specific theory of knowledge is behind some key terms needed for describing, for example, the concept of subjective probability as a degree of belief [4]. Besides, judicial language applied in the context of conclusions of forensic reports entails to write or speak about truth, belief, certainty, uncertainty, doubt, consistency, causes and effects, explanations, and so on. It is not easy to find deep explanations of those concepts in forensic scientific literature because, in fact, it has mainly been a duty of philosophers for centuries.

In the author's opinion, some especially relevant concepts used in the works of the main researches which defend the likelihood principle in forensic science are influenced by the logical positivism. The current work studies some of these terms, used in those writings with a strongly biased semantic positivism, and compares their meanings with those used in the Aristotle-Thomas school. It is intended to show that for this philosophical school the subjective concept of probability<sup>2</sup> is perfectly assumable. However, it is pointed out that the confusion between the verbs 'to know' and 'to believe' that the author of this work perceives in the positivist justification theory implies an intrinsic difficulty to understand and undoubtedly accept the concept of subjective probability.

Four different but complementary epistemological fields are harmonised in this work: ordinary knowledge, law, philosophy and science. They are indeed irreplaceable fields. It is believed that this interdisciplinary approach allows researcher to study the evaluative reporting in Forensic Science from an outstanding viewpoint.

The purpose of the paper here is to discuss what some scholars have proposed in the past as guidance and how we can distinguish between moderate realism and immanentism for clarification purposes briefly (Section 2); to point out some relevant aspects from the philosophy of law to fix the context of its title (Section 3); to apply epistemology to specific terms related to conclusions of expert reports (Section 4); and finally, to draw some conclusions (Section 5).

## 2. Historical background

### 2.1. Epistemology in the 20th century

Some outstanding philosophers of law have studied the epistemological model of judicial determination of facts according

to the evolution of the predominant theories of knowledge in each historical stage. Gascon-Abellan [7, pp. 45–67] points out the following predominant theories of truth in the 20th century: the coherentist theory, defended by Bradley, Neurath, Rescher and Dauer; the pragmatist theory proposed, with different shades, by Pierce, James, Dewey, Kuhn, Habermas and Putnam; and the correspondence theory advocated by Taruffo, Ferrajoli and Tarski, among others.

Gascon-Abellan chooses the correspondence theory for the very reason that it is the unique among the three ones that, in her opinion, complies with the aim of the judicial process to investigate criminal facts. She states that “both, in common and judicial languages it isn't asserted that a set of statements on facts is true because it is internally coherent – then, a novel would be it –, because it is accepted – even unanimously –, or because it is simpler than others, but the described facts have really happened.” And she continues further to say the following: “... the coherentist and pragmatist concepts disconnect from the aim of the judicial process to set facts, that it is the very reconstruction of facts, as those happened”. Gascon-Abellan also states that “the correspondence theory is based on a minimum realist philosophy that, without despising the theoretical conditioning, and, above all things, regarding the judicial-institutional process ‘to access to the facts’ –, allow us to keep the hope of having an objective knowledge”. And she finally adds that “The majority of the realist epistemologies bet on the realism precisely to justify the objectivity of knowledge.”

However, the coherentist and pragmatist theories of truth were predominant in the second half of the 20th century Anglo American epistemology [8, pp. 633–671] and it can be appreciated its influence in the Bayesian literature.

The concept of belief has been used by Anglo American epistemologists as an essential element to define the concept of knowledge. They linked it to the Greek word ‘doxa’ which may be translated as opinion. Therefore, for them, belief and opinion mean, in general terms, the same thing.

The term ‘belief’ shows the following features [9, p. 138]: (i) it can comprise any kind of judgement – in its broadest sense – and then it is identified with what is consented, asserted, i.e. the judgement itself; (ii) it can also be an affirmation mixed with uncertainty, matching up with what we called opinion; and (iii) it can appoint to certainty in opposition to science: act of faith.

Therefore, one of the possible meanings of ‘belief’, in particular the one that identifies the verb ‘to believe’ with the verb “to know” and which is expressed with the term ‘opinion’, is used by Anglo American epistemologists.

The quoted specific concept of belief is understood as a state of mind. Sometimes it is described either as inferior to knowledge (understood as objective knowledge), or a state of mind, by default, when a human being is willing to know something (finding objectivity). Therefore, it is a state of mind which we have to undergo necessarily if we want to reach objective truths.

For immanentists ‘to know’ has the same meaning as ‘to be willing to know’ because they deny the immediacy of knowledge. They deny the existence of the agent intellect [10, pp. 75–79].

However, the term ‘belief’ is used in Anglo American epistemology with a more precise meaning than the term ‘opinion’. A judgement is called opinion when there is uncertainty in the mind of a person who knows and makes a judgement, that is, when there is fear to err. However, belief does not imply to assent the judgement necessarily for Anglo American epistemologists. Belief is understood as a disposition or habit of mind to accept something as true or probably true.

It might be understood before the vagueness of such a definition of ‘belief’ that the mentioned epistemologists make specific references in their supported definitions of knowledge to the fact

<sup>2</sup> A. Biedermann [5, p. 142], by reference to Lad [6], distinguishes between a formalist and an intuitionist-constructivist view of mathematics. Focusing his attention on the theory of probability, the former could be characterised saying that “the meaning assigned to the terms that make up the formulation of the laws of probability could be considered independently from the formulation of the laws themselves”, and the latter as “a formal language for saying specific things”. A. Biedermann underlines: “Every formula in the language means something, beginning with the most basic items. In particular, in de Finetti's construction ‘the laws’ derive from meaningful assertions regarding prices.”

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