

## THE NATURE OF PHILOSOPHICAL LOGIC AND PHILOSOPHY OF LOGIC

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DOI: 10.13140RG.2.2.14554.96967

### Abstract

*Like most issues within the philosophical realm there are controversies surrounding the nature and subject matter of philosophical logic and philosophy of logic. While some philosophers on the one hand see philosophical logic as using logic as a tool to deal with philosophical problems and take philosophy of logic as a self-check method whereby the tools of logic itself are critically analysed, others on the other hand see no distinction between both. For instance, Susan Haack supports the latter position that there is no clear distinction between both fields while A.C. Grayling and Dale Jacquette are adherents of the former position. This paper attempts an expository analysis of the characteristics of both philosophical logic and philosophy of logic. It argues that though there are basic distinctions in their features, there are points of intersection which makes them co-relevant in the development of logic, philosophy and other related fields.*

**Keywords:** Logic, Philosophy of Logic, Philosophical Logic, Jacquette, Haack, Grayling

### Introduction

Logic, whether seen as a philosophical tool used by philosophers in their activities or as a main branch of philosophy, is of great importance to the enterprise of philosophy and life. Theoretically, philosophers deploy it to substantiate their views and/or solve problems and practically in life and other fields of knowledge including mainstream fields like computational mathematics and Artificial Intelligence, logic is relevant to everyday endeavours. Argumentation and reasoning are central to logic with the goal of logic being to develop a coherent framework that enables us to examine, categorize, and assess both correct and incorrect forms of reasoning.

Philosophy of logic and philosophical logic are both essential components of logic. Some writers define a clear distinction between the roles played by both components. They opine that philosophy of logic is devoted to the investigation, analysis and reflection on issues arising in logic, while philosophical logic concerns questions about reference, truth, quantification, existence, entailment, predication, identity, modality, and necessity. Others reason that there is no difference between what is done by philosophers in both areas, they believe it is a matter of nomenclature used by writers. Martin Tabakov extends this further by defining philosophical logic from four perspective which captures the different understanding of the phrases.

Firstly there is philosophical logic as (a type of) logic and studying logical systems connected to philosophy. In this context, logic examining non-mathematical reasoning is referred to as philosophical logic. It includes those areas and subfields within modern logic where the formal structure of reasoning and the handling of inference are related to particular philosophical issues and logical systems that are built and established in this manner. Secondly, there is philosophical logic as a logic in (of) philosophy and explores the rules of the logical inference, the modes of deduction from and in philosophy. In this sense, philosophical logic is a study of logical consequence and argumentation in philosophy, and particularly the logical problems in epistemology, dialectics, the analysis and explication of the logical structure of specific philosophical theory or classes of such theories. In the wide sense, philosophical logic is not logic, but an interdisciplinary field between logic and other philosophical areas: ontology, epistemology, philosophy of science, history of philosophy.

Thirdly there is philosophical logic as a philosophy in logic, a look at contemporary logic from the point of view of some well-known philosophical schools. For example, how can we look at contemporary logic from the point of view of Hegel or Kant? How do dialectics emerge in logic? What are merits of platonism, agnosticism, realism and nominalism, pragmatism, hermeneutics and existentialism in logic? And lastly is philosophical logic as a philosophy of logic, i.e. a part of the general philosophy of science, similar to the philosophy of physics, of biology, of mathematics. In this view, philosophical logic is an analysis of the development of contemporary logic from the point of view of philosophy of science. It is an analysis of the most important logical results from the standpoint of methodology and discussing questions that are essential for the philosophical interpretation of modern logic. The paper proceeds with brief incursion into the historical development of logic as a branch of philosophy. This is necessary because it is in the course of this development of logic that it acquired such appellation. Thereafter, the distinctive qualities of each would be discussed to point out their points of convergence and divergence where available.

### **Historical Development of Logic**

According to Irving Copi and Carl Cohen, logic is the study of the methods and principles used to distinguish correct reasoning from incorrect reasoning... The logician is concerned with reasoning on every subject: science and medicine, ethics and law, politics and commerce, sports and games and even the simple affairs of everyday life.<sup>1</sup>

Logic and metaphysics according to Joseph Brenner, began in antique as ways of reasoning about nature, or reality. However, relatively early logic developed into simply a tool for determining the truth or falsify of propositions... The most common current definition of logic is that it is an analytical theory intended to formalize principles of valid reasoning as well as a theory of valid inference that provides insights into the foundations of mathematics. Examples of standard logics are classical term or syllogistic logics – “Aristotelian logics. Their recent

modifications include first and higher order predicate logics, modal logics and ampliative adoptive logics.<sup>2</sup>

Traditional logic used the syllogistic method of test propositions with the aim of determining their validity or otherwise but in the modern period the addition of mathematical to formal logic broadened its scope. John Corcoran writes that before Boole, logic was focused on two central problems of logic as formal epistemology: how to show that a given conclusion follows from given premises that formally imply it, and how to show that a given conclusion does not follow from given premises that do not formally imply it.<sup>3</sup> What Aristotle wanted to do was to establish how the validity or invalidity of an argument would be determined. This method continued for time and in the 19<sup>th</sup> century symbolic logic developed through the application of mathematical symbols to formal or Aristotelian logic. Russell notes that logic in the Middle Ages and down to the present day in teaching meant no more than a scholastic collection of technical terms and rules of syllogistic inference.<sup>4</sup> The modern development of mathematical logic dates from Boole's Law of Thought (1854) but Russell believes that the first serious advance in real logic since the time of the Greeks was made independently by Peano and Frege – both mathematicians. They both arrived at their logical results by an analysis of mathematics.<sup>5</sup> Corroborating Russell's view, Copi writes that since the 1840s, symbolic logic has developed along two different historical paths. George Boole (1815-1864) applied algebraic notations and methods first to symbolize and then to validate arguments of the kind studied by Aristotle in the fourth century BC. This route says Copi may be characterized as an effort to apply mathematical notations and methods to traditional, nonmathematical kinds of argument. The other path began with the independent efforts of the English mathematician Augustus De Morgan and Independent American Scientist and Philosopher Charles Peirce to devise a very precise notation for relational arguments.<sup>4</sup> This modern turn set a new course for the development and applications of logic.

Within this period there was a merger of these two paths. The brilliant works of the German mathematician and philosopher Gottlob Frege, the Italian mathematician Guisepe Peano, and the English philosophers Alfred North Whitehead and Bertrand Russell, whose *Principia Mathematica* was an important landmark in the history of symbolic logic,<sup>5</sup> are examples of such merger. In contemporary times logic is being applied in diverse modes to deal with philosophical and logical issues thereby attaining the appellations philosophical logic and philosophy of logic. Dale Jacquette contends that when contemporary philosophers speak of logic, they generally mean to refer to any of a variety of alternative formal symbolisms that can be used to formulate particular aspects of the formal inferential structures of language, including but not limited to languages in which philosophical ideas are conveyed.<sup>6</sup>

Having had a brief notation on the development of logic we now move to see how logic as a tool is used to address general philosophical problems on the one hand and its own problems on the other hand, in other words, philosophical logic and

philosophy of logic. This is a shift in emphasis in contemporary period.

### **Philosophical Logic**

Borrowing a leaf from the assertion of Russell that every philosophical problem, when it is subjected to the necessary analysis and purification, is found either to be not really philosophical at all, or else to be, in the sense in which using the word, logic,<sup>9</sup> philosophers in the contemporary widely apply logic in attempting to clarify or solve philosophical issues. This thus gives essence to philosophical logic. Towing the same route, Lou Goble states that philosophical logic is philosophy that is logic, and logic that is philosophy. It is where philosophy and logic come together and become one.<sup>10</sup> Writing further on the nature of philosophical logic Goble says it is not a special kind of logic, some species distinct from mathematical logic, symbolic logic, formal logic, informal logic, modern logic, ancient logic, or logic with any other familiar modifier. Rather, philosophical logic uses logic as philosophy in everyday analysis. Goble says philosophical logic develops formal systems and structures, to be applied to the analysis of concepts and arguments that are central to philosophical inquiry.<sup>12</sup>

Similarly, Grayling notes that philosophical logic is not about logic; neither is it logic, in the sense in which logic is the study of formal representations and regimentations of inference... philosophical logic is philosophy, philosophy logic – informed and logic – sensitive albeit, but philosophy not withstanding.<sup>13</sup> Philosophical logic is believed to encroach on other areas of philosophy including metaphysics, epistemology, philosophy of mind, philosophy of language etc., but while trying to identify its subject matter and what connects topics under it, E.J. Lowe sees philosophical logic as the philosophical elucidation of those notions that are indispensable for the proper characterization of national thought and its contents. The notions in question are ones like those of reference, predication, identity, truth, negation, quantification, existence, necessity, definition and entailment.

These and related notions are needed in order to give adequate accounts of the structure of thoughts particularly as expressed in language and of the relationships in which thoughts stand both to one another and to objects and states of affairs in the world.<sup>14</sup> Grayling also identified the topics under philosophical logic to include proposition, analyticity, necessity, existence, identity, truth, meaning and reference.<sup>15</sup> These topics are applied in the analysis of philosophical issues in the world.

For instance, Jacquette says that philosophical logic combines the application of logical symbolisms with a commitment to specific philosophical ideas. For instance the problems and methods of applied logic in studying the philosophy of language is within the domain of philosophical logic.<sup>15</sup>

Philosophical logic is thus seen as logic for philosophy which has applications both within and without the discipline. Grayling captures this thought in his description of its distinction with philosophy of logic in his statement that; when one does philosophy of logic, one is philosophizing about logic; but when one

does philosophical logic, one is philosophizing.<sup>17</sup> Next we turn to the nature and subject matter of philosophy of logic.

### **Philosophy of Logic**

The philosophy of logic (or logics) is the philosophical examination of systems of formal logic and their applications.<sup>18</sup> Grayling also says philosophy of logic is an enterprise in which philosophical questions about the nature and some of the implications of logic constitute the subject matter. The problem of entailment, the significance of the Lowenheim – Skolem theorem, quantification theory's scope and limits, the relationship between logic and set theory, and the nature of set theory itself...<sup>19</sup> are all issues dealt with in the philosophy of logic.

It is thus safe to say that the scope of philosophy of logic does not go beyond logic as a branch of philosophy. John Burgess says what logical forms are and how they are related to linguistic forms, are deep and difficult questions not of philosophical logic but of philosophy of logic. They are questions about what logicians are doing when they are at work, not questions that have to be resolved before logicians get to work.<sup>20</sup> Philosophy of logic is at play when logic gets concerned, as Jacquette puts it, with abstract theoretical matters concerning its own formal symbolisms and the properties, such as the scope and limits of logical and mathematical systems concerning as a whole, in the study of logical metatheory.<sup>21</sup>

Goble distinguishes philosophy of logic from philosophical of logic with its investigation of the epistemological and ontological positions of the propositions of logic, of a priority, of conventionality, of questions about what, if anything, is a logical constant, about the nature of logical truth and logical consequence, and even the question 'What is Logic?' itself.<sup>22</sup>

Whenever a limitation is perceived in the application of logical symbols to philosophy problems, philosophy of logic is resorted to develop new analytical instruments. Jacquette further buttresses this point saying that “the need for new formalisms is sometimes made urgent by the limitation of received systems that are only discovered when we try to apply them to real problems. At the same time, developments in symbolic logic that are undertaken purely for the sake of their theoretical interest frequently suggests new applications of logical analysis for which no need had previously been perceived.”<sup>23</sup>

### **Conclusion**

It is observed from the nature of philosophical logic and philosophy of logic that though they are interrelated and sometimes intertwine, they are distinctive. The scope of philosophy of logic is limited to philosophy while that of philosophical of logic extends to other areas of philosophy and disciplines. But irrespective of this, the functions performed by each cannot be overemphasized. Goble writes that today most of the flourishing research in philosophical logic is being done by computer scientists, working, for example, on aspects of knowledge representation, systems verification, AI.<sup>24</sup> These applications are made possible

by the functioning of logic which is always enriched through philosophy of logic. Russell says that logic consists of two parts. The first part investigates that propositions are and what forms they may have; this part enumerates the different kinds of atomic propositions, of molecular propositions, of general propositions, and so on. The second part consists of certain supremely general propositions, which asserts the truth of all propositions of certain forms... The first part, which merely enumerates forms, is the more difficult, and philosophically the more important; and it is the recent progress in this first part, more than anything else, that has rendered a truly scientific discussion of many philosophical problems possible.<sup>25</sup> We can thus infer that for philosophical logic to be able perform optimally, it needs regular enrichment of logic through the philosophy of logic.

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