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LOGIC, RHETORIC, AND HEURISTIC AS ARGUMENTATION THEORIES: AN OUTLINE

The study speculates about logic, rhetoric and heuristics as kinds of argumentation theory. Contemporary argumentation theories are informal logics, and it takes work to distinguish between them. The ultimate aim of traditional formal logic is to study proofs and refutations as logical forms, i.e., argumentation, so traditional logic can be seen as an argumentation theory. Classical and non-classical formal logics have traditional formal logic at their core. It allows them to be seen as argumentation theories. Rhetoric uses argumentation as a means of persuasion, and argument is understood much more broadly in rhetoric than in logic, leading to the practical indistinguishability of rhetoric and argumentation theory. In R. Inhetveen's conception of heuristics, heuristics is understood as argumentation, which allows us to present heuristics (as a specific scientific discipline) as a theory of argumentation.
Keywords: *argumentation theory, heuristics, logic, public relations, rhetoric.*

In the present paper, I am going to make the following inversion. Argumentation theory is usually considered either as a branch of traditional formal logic (along with such branches as concept, judgment, and inference theories) or as a sort of informal logic (there is a wide variety of argumentation theories, such as Stephen E. Toulmin's and Charles Arthur Willard's argumentation fields theory, Frans H. van Eemeren's and Rob Grootendorst's pragma-dialectics, Douglas N. Walton's logical argumentation method, Lucie Olbrechts-Tyteca's and Chaïm Perelman's New Rhetoric, and Christoph Lumer's the epistemological theory of argumentation), or as a part of both philosophical and philological rhetoric. I propose, instead, to invert the view of the notion of argumentation theory and to conceive of it as a generic concept for several concepts that stand for certain intellectual/cognitive practices, such as logic, rhetoric, and heuristics, for example. In other words, I propose to present logic, rhetoric, and heuristics as varieties of argumentation theory.

Logic as an argumentation theory

The initial focus will be on traditional formal logic. This formal logic branch studies logical forms, including concepts (notions), judgments, inferences, proofs, and refutations. The final two forms are typically classified within a subdivision of traditional formal logic, commonly referred to as 'argumentation' or 'argumentation theory'. In traditional formal logic, each successive logical form is constructed on the foundation of the previous one. For example, judgments comprise concepts, inferences are based on judgments, and proofs and refutations are structured as inferences. In other words, the ultimate objective of any construction within the domain of traditional formal logic is the formation of proofs and refutations, i.e., argumentation. It enables me to propose that traditional formal

logic can be considered a form of argumentation theory in which logical forms are essential building blocks for argumentation.

Further, classical formal logic emerged from the algebraic formalization of traditional formal logic, more precisely, of Aristotle's syllogism. George Boole algebraized Aristotle's syllogism, establishing the earliest form of algebra of logic, which he termed 'Boolean algebra'. Suppose traditional formal logic is considered a form of argumentation theory and Boolean algebra is an algebraized formalization of traditional formal logic. In that case, it is reasonable to view Boolean algebra as a form of argumentation theory.

Further, propositional logic (statement logic, sentential calculus, sentential logic, or zeroth-order logic) is a logical system that is closely related to Boolean algebra. Many syntactic concepts from Boolean algebra are transferred into propositional logic with some changes in notation and terminology. Furthermore, the semantics of propositional logic are defined in a way that aligns with Boolean algebra, whereby the tautologies (theorems) of propositional logic correspond to equational theorems of Boolean algebra. Suppose Boolean algebra has been characterized as an argumentation theory. In that case, propositional logic, which is based on Boolean algebra, can also be characterized as a form of argumentation theory.

Furthermore, propositional logic is the foundation of first-order logic (predicate logic, predicate calculus, or quantificational logic). In first-order logic, quantified variables are employed over non-logical objects, and sentences containing variables are permitted. Other-say, first-order logic is a propositional logic with quantifiers. Suppose propositional logic is deemed a form of argumentation theory. In that case, first-order logic, founded upon propositional logic, must also be regarded as a form of argumentation theory.

Classical formal logic, which encompasses classical Boolean algebra, classical propositional logic, and classical first-order logic, is the foundation for a diverse array of formal logic, including high-order, non-classical, non-standard, and philosophical ones. If classical formal logic is a form of argumentation theory, then formal logics based on classical formal logics should also be considered as forms of argumentation theory transitively.

In its entirety, formal logic can be regarded as a specific branch of argumentation theory, wherein distinct formal logics represent disparate theoretical frameworks for argumentation.

As posited by Frans H. van Eemeren, the term 'informal logic' encompasses a "collection of normative approaches to the study of reasoning in ordinary language that remain closer to the practice of argumentation than formal logic" [Eemeren 2009: 117]. It suggests that argumentation theory is synonymous with informal logic and, thus, with critical thinking (another term for informal logic). In other words, informal logic represents a specific form of argumentation theory.

The statements above lead to the conclusion that all logic is, according to some characterizations, an argumentation theory.

Rhetoric as an argumentation theory

'Rhetoric' usually refers to the art or science of persuasion (mainly through speech and writing). Argumentation, among other things, is used to persuade: "Argumentation is an act aimed at persuasion. It is performed by an agent and targets an audience. The goal of the agent performing the argumentation is to convince the audience of something by the means of their argument. The goal targeted by the agent can be the truth of a proposition, the interest of pursuing a particular course of action or anything else related to the beliefs of the audience" [Winterstein 2018: 3]. Argumentation is a means of rhetoric. It allows me to consider argumentation theory as a part (or section) of rhetoric and, in this respect, rhetoric is similar to logic.

In my opinion, however, it is only similar because rhetoric functions differently from logic, and therefore, argumentation as a means of rhetoric functions differently from argumentation as a means of logic. It can be seen in the conception of rhetoric by Aristotle, one of the first developers and systematizers of rhetoric as a particular art and a particular science of persuasion. Aristotle characterizes rhetoric as the universal art that studies all possible means of persuasion [Arist. Rhet.[1] 1.2.1]. The means of persuasion (πιθανός) here either contribute to what the ancient Greeks called πίστις or are themselves πίστις [Arist. Rhet. 1.2.7]. Πίστις can be translated as 'that which is to be trusted', 'something to be trusted', 'faith', 'belief', 'possible proof', 'evidence', or even 'argument'. So, the goal of rhetoric is either to form πίστις or to use πίστις to πείθω ('persuade').

Aristotle divides all means of persuasion into artificial (technical) and non-artificial (non-technical). In the latter category, Aristotle includes contracts, testimony, and torture [Arist. Rhet. 1.2.2]. Contracts obviously serve as evidence in a court of law. Testimony is the statement of eyewitnesses, earwitnesses or witnesses to an incident or event.

Interestingly, for Aristotle, torture is a means of persuasion. Most likely, by 'torture' here, Aristotle means information (or testimony) obtained in the process of torturing a criminal suspect (and perhaps sometimes a potential witness). That is, I am talking about a special kind of evidence not provided by eyewitnesses, earwitnesses and witnesses of their own free will but obtained against the will of eyewitnesses, earwitnesses and witnesses. From this point, physical coercion and violence can be considered as a means of persuasion in some contexts.

Yet it is possible to imagine a situation in which violence itself (e.g., in the form of torture) can serve as a means of persuasion. A scene comes to mind from the film *A Clockwork Orange* (1971, directed by Stanley Kubrick), in which Malcolm McDowell's character Alex is convinced through a psychological experiment that violence, including sexual violence, is wrong: Alex is strapped to a chair, his eyelids are taped shut, and he is forced to stare for hours at a movie screen that repeatedly shows violent acts accompanied by Beethoven's music, which arouses Alex's protest and disgust.

To artificial means of persuasion, Aristotle includes what is obtained through unique methods or by people's efforts [Arist. Rhet. 1.2.2]. The artificial means of

persuasion, according to Aristotle, include the *ethos* of the speaker (ήθος του ομιλητή), the *pathos* of the hearer (πάθος του ακροατή), and the *logos* (λόγος) [Arist. Rhet. 1.2.3]. A speaker's *ethos* is something by which the speaker is trusted [Arist. Rhet. 1.2.4], such as the speaker's authority, status, or reputation. A speaker's *ethos* is assumed to attest to the speaker's inner morality or moral behavior. In essence, *ethos* is using one's positive image to persuade people; it appeals to one's authority, i.e., manipulation. The listener then pays attention not only to what is being said but also to who is speaking.

The listener's *pathos* is an appeal to the listener's feelings, emotions, passions, and affects [Arist. Rhet. 1.2.5]: the speaker appeals to the listener's sensitivities and, through the listener's sensitivities, influences the listener, i.e., manipulates the listener's sensitivities.

In fact, both *ethos* and *pathos* are used to 'bypass' the listener's rational deliberation. It is primarily the 'sin' of suggestion (inculcation, instilling, indoctrination). However, if the speaker is a charismatic orator, the 'bypassing' of rational deliberation is carried out, among other things, at the cost of the speaker's emotions: here, the speaker 'contaminates' the listener with his/her emotions.

Then there is *logos*, the speech itself. The speech itself convinces here – and nothing else, not *pathos* or *ethos* [Arist. Rhet. 1.2.6]. The persuasiveness of speech is achieved by using the means of logic. In other words, speech is persuasive because it is logically valid and sound.

Aristotle holds that in order to use all possible means of persuasion, it is necessary to have a good command of dialectics (the logic of plausible reasoning, topics) and politics as a part of ethics [Arist. Rhet. 1.2.7]. Dialectics is responsible for the persuasiveness of speeches in themselves, that is, *logos* (here, rhetoric merges with dialectics, or rhetoric and logic are indistinguishable [Arist. Rhet. 1.2.7]). Politics as a branch of ethics should study people's mores, virtues, and feelings [Arist. Rhet. 1.2.7] (in fact, politics as a branch of ethics here is a syncretism of ethics, politics, and psychology), responsible for *ethos* and *pathos*. Hence, Aristotle's rhetoric is an interdisciplinary field of knowledge that combines Aristotelian dialectics and politics as a branch of ethics or, to put it in more contemporary terms, formal logic, ethics, politics, and psychology.

If, in the context of *logos*, rhetoric coincides with dialectic (or, more broadly, with logic), then it is plausible to assume that the argumentation theory that is part of rhetoric can coincide with the argumentation theory that is part of traditional formal logic. Rhetoric uses logical argumentation for the purpose of persuasion. However, this possibility exists only concerning *logos*. What about the other means of persuasion? Is argumentation used in them? The Ukrainian rhetorician Mykola Ovcharov proposes to distinguish between logical and proof argumentation. Logical argumentation is proof and refutation as logical forms; it is a subject of study of logic, whether formal or informal. To understand what proof argumentation is, let me look at its types. The first type of proof argumentation is scientific or professional: "To prove his position, the speaker uses everything subject to intellectual or logical analysis" [Овчаров 2023: 174]. Here, the

argument results from applying some method of analyzing the experience of numerous objects, namely scientific research, experiment, statistics, analysis, sociological surveys, and expert opinions [Овчаров 2023: 174].

The second type of proof argumentation is practical: here, the argument is determined by the experience of an individual or a particular group of people [Овчаров 2023: 174]. The third type of proof argumentation is visual (emotional): here, either visual images or something that refers to a sensory (emotional) experience is used as an argument [Овчаров 2023: 176].

Ovcharov's typology shows that arguments used to justify a thesis (i.e., to make the thesis convincing) do not necessarily have to take the form of judgments, propositions, assertions, and formulas, as is customary in logic. In fact, in rhetoric, an argument is understood much more broadly than in logic: an argument here can be anything that leads to a particular point of view or action.

If anything can be an argument in rhetoric, then anything can be considered a thesis (claim, point) and a demonstration (form of connection between thesis and argument(s)). For example, if an image is used as an argument, the thesis will be the desired mental (psychic) reaction, and the demonstration will be specific psychophysiological and sociocultural processes. Or if a torture is used as an argument, the thesis will be the desired statements, and the demonstration will be specific psychophysiological process initiated by violent actions. Argumentation in rhetoric is really a variety of ways to justify something: emotions, images, logical means, tropes, violence, etc.

Furthermore, if argumentation theory is the study of the means of persuasion, and rhetoric is the study of the means of persuasion (according to Aristotle), then argumentation theory and rhetoric turn out to be identical. Moreover, if logic has previously been characterized by me as a kind of argumentation theory, and if logical argumentation is included in rhetorical argumentation (it could be seen that rhetorical argumentation is more extensive and more free than logical argumentation), then it is a surprising conclusion that logic should be included in rhetoric.

What remains to be chosen is whether 'rhetoric' and 'argumentation theory' are unambiguous concepts. If they are unambiguous, then any argumentation theory is automatically considered either a part of rhetoric or a kind of rhetoric, or identical to rhetoric. If they are not unambiguous, then rhetoric, including logic, is an argumentation theory[2].

Heuristics as an argumentation theory

In discussing heuristics as an argumentation theory, I will draw on the conception of heuristics proposed by the German philosopher of science Rüdiger Inhetveen. Inhetveen argues that heuristics are concerned with situations in which it is not clear what the next step should be in solving a given problem [Inhetveen 1987: 32]. Heuristics are used in such situations, and these include arguments. Inhetveen believes that an argument is used heuristically when the argument is used to 'justify' the next step in a situation where that next step is determined not

only by the knowledge that a different choice would lead to failure [Inhetveen 1987: 32]. Inhetveen also notes that arguments that can be used heuristically in more than one special case are considered to belong to the heuristic [Inhetveen 1987: 32]. Such arguments can be made into rules [Inhetveen 1987: 32]. However, unlike rules of rationality, rules of heuristics do not guarantee success but only provide a basis for expectations [Inhetveen 1987: 32]. When applying heuristics, heuristic argument, according to Inhetveen, we can never be sure that we will actually find something, get a guaranteed correct/right result.

Inhetveen distinguishes between two types of heuristics. The first type of heuristic is the *ex-ante* heuristic, which is used before a solution is found [Inhetveen 1987: 33]. The rules of *ex-ante* heuristics are typically used to reduce the myriad of possible steps to a few by eliminating others or by establishing preference relations that would result in one or more steps being tested first [Inhetveen 1987: 33]. This type of heuristic is the most common because it is used in situations where there is no guaranteed way to solve the problem at hand, and you have to invent the way. For example, imagine that you have a running machine in front of you and you need to turn it off, but you do not know how to do it because you have never dealt with this kind of machine before and you have never been given instructions on how to use it. There is a remote control, which you assume is the remote control for this machine. What do you do in this situation? You will most likely use the heuristic known as 'trial and error'. In the simplest form of this method (known as 'blind guessing'), you press all the buttons in a row – and you press them, assuming that one of them will turn out to be the button that turns the machine off. This technique may or may not work. If it does work, then the solution should be memorized, and the next time you encounter a machine of this type, you will know which button to press to stop it, i.e., you will use this heuristic as a 'rule' (or a 'rule of thumb').

The second type of heuristic is the *ex-post* heuristic, which is used to find evaluations of proposed solutions, unexpected ideas of proposed theories, and other well-formulated ways of overcoming problem situations [Inhetveen 1987: 33]. The most crucial use of *ex-post* heuristics in research is in writing textbooks or books on the history of science and technology, in the responses of peers or experts that integrate partial solutions to technical and scientific problems into broader contexts, and so on [Inhetveen 1987: 33][3]. Take the same example of a running machine. You have turned the machine off using the 'blind guessing' technique. Now, you need to evaluate the resulting solution. For example, you might try to evaluate this solution in the context of a 'paradigm': you might find that the button to turn off the machine is red. Further, you can assume that the colors of the buttons on the machine's remote control correspond to the colors of traffic lights and semaphores, in which red is a signal to stop movement (corresponding to the end of the machine's movement (work)), and green is a signal to start movement (corresponding to the beginning of the machine's movement (work)). The reference to a specific 'paradigm', the established practice of coloring the beginning of the movement with green and the end of the movement with red,

is also an argument.

The above may serve as a basis for my assumption that heuristics are a kind of argumentation theory used within problem-solving and decision-making theory in situations of uncertainty, especially in situations of uncertainty about the means of solving problems and making decisions.

Conclusion. The result of my inversion is that, in principle, there is no difficulty in introducing logic and heuristics as types of argumentation theory. There are already problems with rhetoric since rhetoric merges with argumentation theory, and the former becomes indistinguishable from the latter. Moreover, my speculations have led to the idea that logic can be seen as a constituent part of rhetoric. It is quite conceivable that heuristics could also be seen as a constituent part of rhetoric. However, this would require a separate consideration.

More generally, my work shows that there are no clear boundaries between intellectual/cognitive practices such as logic, rhetoric, heuristics, and argumentation theory, which in turn can lead to questions about the actual disciplinary boundaries (and limits) of logic, rhetoric, heuristics, and argumentation theory, and blur clear and distinct understandings of what logic is, what rhetoric is, what heuristics is, and what argumentation theory is.

Notes

[1] 'Arist. Rhet.' is the shorthand for 'Aristotle, *Rhetoric*'; is a reference to the work Aristotle titled 'Rhetoric'. For my paper, I relied on the 1877 edition of Aristotle's *Rhetoric* [Aristotle 1877].

[2] The Ukrainian philosopher and logician Anatoly Konverskyi gives the following definition of rhetoric: "Rhetoric is a type of argumentation that forms beliefs using linguistic influence with the appropriate use of techniques and procedures of logic" [Конверський 2020: 332]. Konverskyi adds that "rhetoric, as a discipline of the logical cycle, has its own object, which is such a product of human intellectual activity as 'speech', and the means of studying this object, which is peculiar to it" [Конверський 2020: 332–333].

Konverskyi also raises the question of the similarities between rhetoric and public relations: "Sometimes in different sources rhetoric is confused with PR ('public relations'). They are different things. *PR* is the formation, management, and deception (manipulation, as they say nowadays) of public opinion" [Конверський 2020: 350]. In other words, it can be assumed that public relations (and related practices, such as marketing, advertising, journalism, and the theory of information and psychological warfare) are developed rhetorics. This is partly backed up by the fact that historians of public relations consider ancient Sophistry, which invented and developed dialectic and rhetoric, to be the prototype of public relations [Афанасьєв 2016: 16–22].

[3] R. Inhetveen's typology of heuristics can be the ground for revising the so-called 'contextual distinction', according to which there is a 'context of discovery' and a 'context of justification'. Typically, only the 'context of discovery' is associated

with heuristics. However, what Inhetveen proposes at least allows us to question the role of heuristics in the context of justification (of hypothesis or theory).

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Костянтин Райхерт

ЛОГІКА, РИТОРИКА Й ЕВРИСТИКА ЯК ТЕОРІЇ АРГУМЕНТАЦІЇ: НАЧЕРК

У дослідженні розглядаються логіка, риторика та евристика як різновиди теорії аргументації. Сучасні теорії аргументації – це неформальні логіки, і потрібно докласти зусиль, щоб їх розрізнити. Кінцевою метою традиційної формальної логіки є вивчення доведень і спростувань як логічних форм, тобто аргументації, тому традиційну логіку можна розглядати як теорію аргументації. Класична і некласична формальна логіка мають традиційну формальну логіку в своїй основі. Це дозволяє розглядати їх як теорії аргументації. Риторика використовує аргументацію як засіб переконування, а аргумент розуміється в риториці значно ширше, ніж у логіці, що призводить до практичної нерозрізнюваності риторики і теорії аргументації. У концепції евристики Р. Інхетвена евристика розуміється як аргументація, що дозволяє представити евристику (як конкретну наукову дисципліну) як теорію аргументації.

Ключові слова: *евристика, логіка, паблік рилейшнз, риторика, теорія аргументації.*

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