Artigos

Logic and hermeneutics a century on from Davos

Lógica e hermenêutica um século depois de Davos

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ABSTRACT

While the profound transformation of Aristotelian logic in the 19th century is well-known, the equally profound transformation in 20th-century logic, particularly compared to the previous century, is much less acknowledged. This transformation, though a topic explored by specialists, remains underrepresented in the broader philosophical mindset. Its most notable significance lies in the expansion of the formalization process conducted by logic beyond the realm of mathematics and into other forms of discourse, particularly those intrinsic to natural language. Given this profound shift in logic, it becomes imperative to reconsider the question of the relationship between logic and hermeneutics, ensuring due attention is given to this landscape.

Keywords

Hermeneutic. Mathematical logic. Heidegger. Carnap.

RESUMO

Ao mesmo tempo em que a profunda transformação da lógica aristotélica no século XIX é bem conhecida, a igualmente profunda transformação acontecida no século XX, em particular se comparada com o século anterior, o é muito menos. Esta transformação, ainda que seja um tópico explorado por especialistas, permanece ignorada pelo saber filosófico médio. O seu mais importante rasgo consiste na expansão do processo de formalização conduzido pela lógica, para além do reino da matemática, a outras formas de discurso, em particular, àqueles próprios da linguagem natural. Dada essa profunda mudança na lógica, é um imperativo reconsiderar a relação entre lógica e hermenêutica, outorgando a devida atenção a essa nova situação.

Palavras-chave

Hermenêutica. Lógica-matemática. Heidegger. Carnap.

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1 INTRODUCTION

The title of our text is bound to intrigue anyone familiar with the philosophical landscape since the 19th century. Given that, since that period, "logic" has been commonly associated with mathematical logic, and that the mathematization of the universe has played a pivotal role in shaping modern science, the concept of logic is intricately intertwined with the so-called *Naturwissenschaften*. Concurrently, the concept of hermeneutics – that also emerged in the 19th century – became almost synonymous with the so-called *Geisteswissenschaften*, advocating for essential epistemological pluralism within science – i.e. a fundamental distinction in the objectives and methods of natural and human sciences. In this case, it is quite irrelevant to acknowledge the critical reevaluation of hermeneutics' affiliation with the *Geisteswissenschaften* as of Gadamer's *Wahrheit und Methode* (1970), which proposes the overcoming of hermeneutics' connection to modern science in favor of resuming its link with the humanistic tradition. The proposal to somehow link hermeneutics to science is considered, from this perspective, a lingering scientism to be overcome by anchoring hermeneutics in fundamental ontology. In turn, this approach posits *Verstehen* [understanding] as Dasein's fundamental mode of being, the basis upon which hermeneutics can authentically achieve its universal ambitions. This later development thus accentuated even further the divergence between logic and hermeneutics.

Illustrating this relationship between hermeneutics and mathematical logic, the famous 1920s controversy between Heidegger (1929) and Carnap (1931) serves as a paradigmatic example. This dispute, as is well known, culminated in nothing other than the irreconcilable symbolic divide at the famous Davos Congress, underscoring the sheer impossibility of dialogue between the two, henceforth known as the "parting of the ways" (Friedman, 2000). The controversy still resonates deeply within contemporary philosophical discourse, and the multitude and variety of historical-philosophical perspectives on the subject, particularly in Brazil, reflect the enduring relevance of how the relationship between hermeneutics and mathematical logic was framed at that time.

However, a closer examination of the positions held by each party in the debate reveals that "the" logic advocated by Carnap is precisely the one that, stemming from the analysis of mathematical discourse initiated in the 19th century, extends to the reconstruction of the language of science as a whole. Specifically, "the" logic primarily

referred to by Carnap in his argumentation, the foundation of *Der logische Aufbau der Welt* (1928), essentially comprises propositional calculus, predicate calculus, and set theory. Nevertheless, in 2023, nearly a hundred years later, can we still regard this form of logic as "the" logic and, potentially, the appropriate and ultimate benchmark for exploring the interactions between logic and hermeneutics today? Certainly not.

While the profound transformation of Aristotelian logic in the 19th century is well-known, the equally profound transformation in 20th-century logic, particularly compared to the previous century, is much less acknowledged. This transformation, though a topic explored by specialists, remains underrepresented in the broader philosophical mindset. Its most notable significance lies in the expansion of the formalization process conducted by logic beyond the realm of mathematics and into other forms of discourse, particularly those intrinsic to natural language. Given this profound shift in logic, it becomes imperative to reconsider the question of the relationship between logic and hermeneutics, ensuring due attention is given to this landscape. That is the objective of this text.

However, for a fruitful comprehension of what ensues, it is advisable to establish a clarification from the outset. The proposition here is entirely distinct from a reductionist perspective seeking to subsume hermeneutics under logic, conflate *Geisteswissenschaft* with *Naturwissenschaft*, or, in essence, sacrifice "humanism" for the sake of "scientism." On the contrary, steering clear of any reductionism that prioritizes a particular model of rationality or unilaterally confines the concept of rationality, the ultimate goal is to propose a sufficiently comprehensive notion of rationality that liberates us from both relativistic irrationalism and the absolutism of platonisms and transcendental subjects. In other words, but to the same effect, the foundational belief guiding this inquiry is that human rationality is inherently finite and, in its finitude, exhibits highly general structures that are ultimately shared by *Natur-* and *Geisteswissenschaften*, and even by science and the *Lebenswelt*. In essence, the objective is to formulate an idea of rationality that is comprehensive enough to account for the inherent unity of seemingly opposing dichotomies.

With the aforementioned, we anticipate the response to a potential objection that merits explicit consideration. The utilization of formalization as a tool for establishing the most abstract principles governing finite rationality in its most general form is a resource that cannot be overlooked. On a cursory examination, this might create the

impression that our proposition is characterized by a primacy of mathematical logic over hermeneutics. After all, we propose to elucidate the latter based on the resources of the former, a stance open to criticism for potential loss of their particularities. In fact, what we propose is genuine complementarity. Viewed from another angle, our approach actually posits a certain primacy of hermeneutics. Historically, mathematics and the endeavor to mathematize the universe have been closely connected with the idea of an absolute rationality and the attempt to emulate the perspective of God, the Geometer. In contrast, hermeneutics, especially from the 19th century onwards, has been more attuned to acknowledging the historicity of reason and, at least superficially, appeared more inclined toward a certain relativism. Therefore, the concept of rationality advocated here, as fundamentally finite, is rooted much more in hermeneutics than in mathematical logic, more in the *Geistes*- than in the *Naturwissenschaften*. To phrase it differently, while the form of our proposition is grounded in logic, its content finds its basis in hermeneutics. In short, the objective is to accurately formulate a fundamentally correct idea of hermeneutics – the notion of the finitude of Reason – using the formal resources afforded by mathematical logic.

If the overarching theme of my reflections is the development of a theory of finite rationality, the theses I seek to prove here are as follows:

a. The transformation in logic from the 19th to the 20th century represents a profound revolution, mirroring the seismic shift that took place from Aristotelian to 19th-century logic.

b. This revolution entailed the formalization of discourse beyond the confines of mathematics, primarily into areas associated with natural language.

c. The progress in logic's formalization of non-mathematical discourse can be effectively applied in hermeneutics, just as the consideration of specific hermeneutical issues can enrich and enhance the formalization of non-mathematical discourse. This suggests the cultivation of a reciprocal relationship, promising mutual enrichment on both sides of the Rubicon.

d. Hermeneutics and mathematical logic are not diametrically opposed and disconnected; rather, they are ultimately particular modes of finite rationality and must be understood in their differences and specificities within this framework.

2 LOGIC IN THE 20TH CENTURY: TOWARDS A LOGIC OF FINITE RATIONALITY

2.1. Descriptive Aspect

Kant's claim that logic has undergone no significant changes since Aristotle is not only contradicted by the developments in 19th-century logic but also by the transformations witnessed in 20th-century logic. The undeniable reality is that there is a decisive shift in the *Faktum* of logic in the 20th century compared to the 19th century, and this transformation is as noteworthy as the one that transpired between the 19th century and Aristotelian logic.

Without aspiring to comprehensively describe this new scenario in all its intricate details, let us provide a concise synthesis of the key developments[2].

a. The 20th century saw the emergence of alethic modal logic, delving into properties such as necessity and contingency – a theme that had been utterly overlooked in the context of the Fregean revolution but proved to be remarkably fruitful from both a formal and a philosophical perspective.

b. Somewhat connected to the previous point, and perhaps for that reason causing more limited impact, the area saw the emergence of deontic logics (which can be considered a subset of modal logics with a non-alethic operator like "ought to" or "ought not to," etc.).

c. The phenomenon of time, once the realm of ineffable pure intuition, is now addressed by temporal logics that formalize relations of simultaneity, precedence and posteriority.

d. If mathematical logic initially started as a theory of quantification but limited this quantification to objects, intensional logics now address the quantification of predicates.

e. While mathematical logic initially constructed propositional calculus based on the bipolarity of truth and falsehood, many-valued logics operate with other values that are epistemologically relevant, such as undetermined, etc., and even incorporate quantification of degrees of probability.

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[2] Strobach, 2015; Stelzner, 2013; Beaver/Denlinger, 2021; Priest, 2008; Hasle, 1995; Hartmann, 1990; Lenzen, 1980; Hack, 1978; Kralmann/Stickerl, 1978; Lorenzen/Lorenz, 1978; Äquist, 1975; Hilpinnen, 1971.

f. Paraconsistent logics challenge a fundamental principle of classical logic – the principle of explosion, which posits that everything can be derived from a contradiction.

g. Intentional states, such as knowing and believing, traditionally within the purview of phenomenological approaches, find formal representation in epistemic and doxastic logics, characterized by their intensional nature, where the truth value of the whole is not solely a function of the truth value of its parts.

h. Indexical logics, on their turn, address contextual aspects of language, such as the use of "I," "now," etc., which were initially excluded from semantic and logical-mathematical treatment in the pursuit of developing a logically perfect language.

i. Dialogical logics refrain from presupposing the principle of bivalence, a concern in treating the indispensable infinite in mathematics, defining propositional operators based on rules of the game in dialogue and showcasing their potential in progressing towards the construction of predicate calculus, etc.

j. Suppositional logic, stemming from pure semantic context analysis, extend into pragmatic contexts, revealing that actual discourse operates based on presuppositions.

k. Erotetic logics delve into the how the relationships between questions, their answers, presuppositions, and other questions can be formalized.

l. Mereological logics scrutinize relationships between parts and wholes.

m. Intuitionistic logics reject the excluded middle and consider only direct proof procedures as legitimate.

If, until this point, we have presented a random listing of the logics that emerged in the 20th century, it was to confront the reader with a stark reality and thereby emphasize the need for reflection on it. Certainly, various attempts have been made to introduce order into this apparent chaos, offering diverse classifications based on different criteria.

The most pivotal classification distinguishes between classical and non-classical logics, and within the former, it further delineates between classical *stricto sensu* and extended classical logics. Accordingly, Aristotelian and Fregean logics fall under classical *stricto sensu*, while modal, deontic, temporal, epistemic, and intensional logics belong to extended classical logic. Paraconsistent and, more broadly, so-called deviant logic (which encompasses not only paraconsistent but also many-valued and fuzzy logics

in general) reside within the realm of non-classical logics. These classifications are not necessarily exhaustive but rather serve as ordering distinctions. For instance, the distinction between "normal" logics and deviant logic, or between normal and philosophical logics, aims to address the fact that while 19th-century mathematical logic primarily sought to account for mathematical discourse, the new logics conceived in the 20th century either focus on applications to philosophical issues or prove to be fruitful in relation to these issues. Modal logic, for instance, has given rise to the entire theory of possible worlds and, ultimately, a renewal of semantics and ontology, while paraconsistent logic has sparked a fundamental discussion about the nature of logic and reality. Hence, the term "philosophical logics" is often used interchangeably with the philosophy of logic in general.

While these classifications bring some order to an otherwise dynamic and chaotic universe, they must not lose sight of the fundamental problem: elucidating the significance of the fact that major changes in logic are not limited to the 19th century but have continued.

2.2. Philosophical Consideration

Fundamentally, the lasting question is whether logic has undergone a transformation in its very essence. Should we reconsider the longstanding understanding of logic that has persisted for centuries? Alternatively, taking a more modest approach, we can pose a simpler yet more agreeable question: in 20th-century logic, numerous new logical theories have been introduced in contrast to what we might term classical logic (Aristotelian+Fregean) – this fact is indisputable. The key question is whether these theories have been simply added together, lacking a guiding systematic plan that would unite them cohesively from a particular perspective. Is that really so? We should ask ourselves whether there is a common denominator among these theories or if they are merely a collection of incomparable novelties. Moreover, assuming there is a common thread, what is it? Broadly speaking, as the commonality among these theories is initially articulated in a purely negative manner in relation to their predecessors. In simpler terms, while 19th-century logic primarily formalized mathematical discourse and, specifically, its modes of inference, 20th-century logic extends its formalization to encompass other

domains of discourse. Yet, can we provide a positive characterization of this commonality?

A prominent and influential perspective, articulated by Susan Haack (1978), posits that the defining characteristic of 20th-century logic is its expansion to account for domains of discourse beyond mathematics – specifically, realms closer to natural language and everyday – not strictly scientific – discourse. Others offer a more nuanced viewpoint, instead of a purely negative description, asserting that "[...]while the logic of the late 19th century existed at the intersection of philosophy and mathematics, the logic of the late 20th century, at least a significant portion, should be conceptualized at the crossroads of philosophy and the sciences focused on human cognition." (Lazzer, 2004, p. 438). In essence, this suggests a shift in orientation, contending that while the logic of the 19th century was inclined toward mathematics, its 20th-century counterpart was driven, stimulated, and/or inspired by cognitive sciences. Others adopt a broader stance, asserting that the primary motivation behind 20th-century logic is the formal examination of common-sense human reasoning. Some commentators even highlight "a radical transformation toward a logic attuned to the psychological[3] realm, wherein deviations from mathematical logic – but naturally inferred – are tolerated if they align with practical effectiveness for an agent constrained by cerebral space and real-time constraints." (Lazzer, 2004, p. 440). These varied interpretations differ not only in their level of generality but also in their descriptive versus explanatory orientations.

I believe I have provided adequate evidence elsewhere[4] that 20th-century logic does not represent an abrupt departure, challenging the very notion of logic, but is rather a continuation of the ongoing process of formalization and the gradual elimination of intuitive elements – a hallmark of logic's historical evolution. Note that the initial phase involved eliminating the intuitive element within the formal sciences and implication relationships. Subsequently, this process extended into other realms of discourse specific to natural language. What remains crucial is, therefore, the continued elimination of intuition and emphasis on formalization. Intriguingly, in this context, establishing general objective principles, akin to what happened with the principle of identity or the principle

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[3] Note the introduction of the psychological notion in our ongoing discussion (to be elaborated later). For now, we will temporarily suspend further elaboration.

[4] *Introduction to the theory of finite rationality I: the history of logic as the history of reason.* See the idea of "Computational hermeneutics" by David Fuenmayor (2019), which appears to be a new trend in formalization

of totality, appears to be no longer feasible, reflecting the inherent nature of the subject matter.

However, if the process of formalization and elimination of intuition underscores a continuity between 20th-century logic and its predecessor, a distinctive aspect of this process should not be overlooked: its extension into a domain previously regarded as essentially non-logical and, rather, purely factual. What does this mean? In our view, this implies a growing awareness in the explicitation of reason regarding the inherently finite nature of our rationality.

Certain critics, noting the increasing proximity of logic to the authentic discourse of the "epistemological actor," have started to argue that logic seeks to model the behavior of a "logical agent." Yet, moving beyond mere tautology, we must probe deeper into the notion that logic (the theory of rationality) concerns itself with the behavior of a "rational being." Moreover, a pivotal question emerges: what type of rational beings are these? Do they align with the description of rational beings, as suggested in the quoted text, restricted by cerebral space and real-time constraints? However, this is merely a somewhat rhetorical manner of saying that the "agent" under logical scrutiny is, fundamentally, a "finite rational being." When we acknowledge that 20th-century logic considers "an agent limited by cognitive limitations and real time," what seems to be missing is the recognition of finitude as the ultimate reference point.

Certainly, this may be subject to questioning, since, for instance, Transparent Intentional Logic explicitly stems from a Platonist assumption. However, individuals advancing in formal sciences are not always completely aware of the profound significance of their endeavors. Their convictions and motivations may be entirely contingent in relation to their future effects, which are the genuinely significant ones. In summary, the notion of crafting a logic well-suited for finite rationality is already in progress, even if not fully self-aware in the evolution of 20th-century logic. One of the outstanding tasks is, thus, to establish connections among logical theories that have been developed, at times, with very specific objectives or interests, yet can be interrelated to generate more robust and compelling systems both from epistemological and philosophical perspectives.

3 LOGIC AND HERMENEUTICS I

Finitude has been a subject of consideration for hermeneutics since the 19th century, gaining even greater prominence in the 20th century. Therefore, as the question of finitude becomes increasingly significant in logic, and given that it has always been integral to hermeneutics, a natural inquiry arises: to what extent is the approach of logic to finitude also an approach to hermeneutics?

As noted earlier, hermeneutics has played a decisive role, from Dilthey to Heidegger, in bringing human finitude to the forefront, thereby establishing at least the necessary negative foundations for a theory of finite rationality. Moreover, a comprehensive understanding of hermeneutical rationality is contingent upon the framework of a theory of finite rationality. Due to the inseparable link between hermeneutical rationality and finite rationality, a theory of finite rationality can equally be viewed as a hermeneutical theory of rationality.

Let us delve deeper into this idea, keeping in mind the distinction between three interrelated yet distinct issues:

a. The role of logic in developing a comprehensive theory of finite rationality across its various expressions.

b. The potential application of logic and its contributions in the field of hermeneutics.

c. The possibility of expanding the formalization of Reason into the realm of hermeneutics, i.e. into the intricacies of sense relationships, ultimately leading to a "hermeneutical logic".

The examination of the first theme has been thoroughly presented in a previous work (González Porta, 2024), and while it forms the backdrop of this discussion, it will not be the primary focus here. Instead, this article will delve deeper into the second and third points. The fundamental characteristics of finite rationality in contrast to infinite rationality are:

a. Possibility of error (God does not err).

b. Distinguishing between sense and truth value (God simultaneously learns sense and truth value).

c. Essentiality of the process (givenness of the product).

d. Erotetic character (God does not ask questions).

e. Thinking from presuppositions (God does not presuppose).

f. Partial vision (God is omniscient, knows and understands everything).

g. Dialogical character (God does not engage in dialogue).

h. The essential dialectic of knowing and not knowing, understanding and not understanding.

i. Historicity (God is in eternity).

j. Necessity of experience (a *priori* knowledge).

Of course, all these characteristics of finite rationality as such apply *mutatis mutandis* to hermeneutical rationality. This is particularly true for characteristics c, e, f, and g, as these phenomena are clearly and formally addressed in specific recent logical theories, making the connection noticeable. I will dedicate the next chapter to elucidating this point, which corresponds to the task indicated as b.

Yet, this exploration constitutes merely the initial stride towards engaging with the core issue delineated as item "c." In this stage, we will transcend the resources provided by logic and their potential fruitful application in hermeneutics. Instead, we will venture into the creation of a novel discipline – hermeneutical logic –, which could potentially redefine our understanding of logic itself. Upon careful consideration, if logic manifests the laws governing Reason and a theory of finite rationality partially and essentially involves hermeneutical rationality, the aforementioned proposition should not come as a surprise.

Reflecting on the historical evolution of logic, as emphasized repeatedly, towards a formalization that eradicates intuition, raises a pertinent question: What are the limits of formalization? To what extent can formalization contribute to hermeneutics? Can sense relationships be formalized? Is it plausible to speak of a logic of sense? Is hermeneutical logic a viable prospect?

4 REMEMBERING WHAT MUST BE REMEMBERED: HISTORICAL BACKGROUND

As the reader contemplates the ideas presented in this text, there may be a burgeoning skepticism regarding the author's rationality and the coherence of the subject matter. Thus, before delving directly into the questions raised explicitly, it is crucial to acknowledge that within the history of logic and philosophy, certain antecedents lend credence to the notion that the project's aspirations are not as far-fetched as they may

initially appear. A positive response to these questions finds some basis in existing intellectual developments. Allow me to explain.

Although the concept of utilizing formalization resources to explore a logic of sense may strike as peculiar, none less than Edmund Husserl had already ventured into this territory, in the guise of a universal grammar, albeit with limited scope (1901). Husserl fundamentally posits the categorical classification of meanings and the exploration of their combinatory relationships. This framework aims to establish universal laws governing the conditions under which elementary meanings could merge into new units of meaning. While Husserl primarily conceives pure meaning relationships as relationships between wholes and parts, the question emerges as to whether all pure meaning relationships must conform to the whole-and-part reduction or if alternative possibilities exist[5].

If the idea of a logic of sense is not unprecedented, neither is the idea of connecting mathematical logic with hermeneutics. Von Wright has proposed and, in a distinctive manner, implemented this linkage with his deontic logic, which notably intersects with historical considerations and their relationship to natural science. Therefore, highlighting the hermeneutic potential of deontic logic is essentially a reference to its foundational impulses that imbued it with philosophical significance, extending beyond the mere formal application of modal operators in non-alethic contexts.

Nonetheless, while groundbreaking, von Wright's work serves only as a precursor of future exploration and does not exhaust the possibilities inherent in this linkage. Further developments, such as Meggle's formalized communication theory, *Handlungstheoretische Semantik*, inspired by Grice, have explored and expanded upon these possibilities.

In essence, the phenomenon of "understanding" (*Verstehen*) is amenable to logical scrutiny, and the application of formal resources proves instrumental in its elucidation. This assertion does not require further evidence, as it has already been demonstrated. However, one might contend that theories arising from the neo-Wittgensteinian perspective presuppose a particular concept of meaning that, while not strictly behaviorist but intentional, align with the notion of meaning as use and make sense only within such

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[5] In this sense, establishing a taxonomy of sense relationships would be a first step, which, without claiming to be exhaustive, shows that they can be extended beyond the relationships of whole and parts, and that, eventually, these are merely a particular case of a much broader phenomenon.

a context. Theories positing meaning as use, at best, assume an already established and operational language, confining themselves to this realm. Hence, we encounter not a theory of original understanding *per se* but rather linguistic understanding, which constitutes a special case. Nonetheless, we should distinguish a "*hermeneutischer als*," etc. Let us acknowledge all of this. Let us even entertain the notion of an original understanding (*ursprünglich*) and acknowledge, perhaps more than necessary, that an experience of sense ultimately refers to an experience that, at best, can only be approached through fundamental ontology. But is this the final verdict?

This question is central to the ongoing discussion and will be revisited subsequently. For the moment, let us not lose sight of the accomplished outcome. The evidence clearly indicates that logical theories can provide formalization resources pertinent to typically "hermeneutic" inquiries, such as elucidating understanding and its correlation with the explication or clarification of understanding in communication. This stands beyond dispute and does not require further argumentation. However, it is evident that these facts fall short of constituting a hermeneutic logic in the complete sense. Hence, the inevitable question revolves around the reach and limitations of these resources. Given the foregoing, the critical juncture is that this cannot be decided *a priori* but must be explicitly deliberated upon. The problem at hand must be explicitly articulated and, hence, its various facets and articulations should be clearly delineated.

5 LOGIC AND HERMENEUTICS II

Exploring the possibility and necessity of a hermeneutic logic naturally starts with the explicit differentiation between sense and truth value, a distinction that is relatively recent. The concept of *Geltung* [validity], prevalent in the latter half of the 19th century and encompassing variations like *Geltungseinheit*, *Geltungssinn*, among others, does not clearly demarcate this distinction, often blurring the lines between these two notions. It was Frege's seminal contribution that firmly established the distinction between sense and truth value. This, in turn, set the stage for the frameworks navigated by contemporary thought, including the clear distinction between the semantic and epistemological problems and the clear priority and primacy that the former acquired over the latter in the 20th century. The unambiguous separation between semantic and epistemological

problems subjectively correlates with the differentiation between the analysis of knowing and the analysis of understanding.

It can be argued that possessing or lacking sense is a simple, irreducible property that is recognizable but beyond explanation. Hence, one might posit that only a hermeneutic phenomenology would be able to consider such a property and potentially contribute to its elucidation. Yet, this does not imply that no sense relationships can be objectified and formalized. The property [A is true] is similarly a simple property that logic takes as a foundational point without further explanation or analysis. Even in the most elementary theory of mathematical logic, like propositional calculus, operates with the relationship between "A is true" and "B is true," establishing formal properties within that relationship. Similarly, while [A makes sense] might be regarded as a simple, indivisible, and irreducible property, formal relationships could exist between [A makes sense] and [B makes sense]. More precisely, relationships of the kind [A makes sense in relation to B] or [the sense of A is in relation X to the sense of B] might be contemplated. It is probable that whether A makes sense in relation to B will hinge on the sense of A and the sense of B, but this does not imply a reduction of this relationship to the simplified notions of [A makes sense] and [B makes sense].

In essence, the clarity in distinguishing between sense and truth value lays a robust groundwork for similarly distinguishing between sense relationships and truth-value relationships. The meaning of truth-value relationships does not require further explanation. But what are sense relationships?

To elucidate this concept, it is prudent to direct our attention to questioning. It can be asserted, without much contention, that a question is not inherently true or false, even if it inherently encompasses propositional content. In other words, especially since Frege, we are accustomed to differentiating between assertion and the propositional content being asserted, acknowledging that the same propositional content articulated in an assertion can exist in a question without being asserted. Questions are undeniably statements that make sense but lack truth value, which makes them a particularly fascinating subject for the exploration of pure sense relationships. When a question is posed, not every linguistic statement holds meaningful relevance as a response. Rather, some responses make sense in relation to a question, while others do not. For instance, if I inquire about the weather and someone answers that John bought a car, such response

evidently lacks coherence with respect to the question. Furthermore, questions can be categorized into types, with certain types of questions inviting only specific forms of responses. Some questions may be answered with a straightforward "yes" or "no", whereas others may not. Among the latter, there are questions containing interrogative pronouns (commonly known as wh-questions). For each type, some answers may make sense while others may not. For example, if I ask about John's whereabouts, answering with "yes", "no", or stating that it is "half past five" is nonsensical. However, questions not only maintain sense relationships with their answers but also with their presuppositions. If a question presupposes something, the sense of the question depends on that presupposition and, ultimately, on the truth of its underlying presupposition. Moreover, questions can establish relationships with other questions, the context in which they are posed, and so forth. It is crucial to note that, in all these instances, there exists a distinctive sense relationship, which is not merely a sense relationship between two linguistically abstract entities. Merely having sense in isolation does not guarantee that the relationship between these entities also makes sense.

While the given example may momentarily satisfy the reader's curiosity and be rhetorically pleasing in that sense, it serves as nothing but a first step. The systematic issues demanding clarification and organization are still pending. In fact, they have not been adequately posed yet. If we acknowledge the validity of sense relationships, particularly concerning the connection between a question and its answer, or a question and its presupposition, etc., the subsequent inquiry follows:

a. Firstly, to offer an abstract definition of this relationship, potentially employing the concept of logical consequence or establishing a connection with this concept.

b. Secondly, in the absence of such a definition, to provide an illustrative enumeration that is sufficiently comprehensive and instructive.

c. In the best-case scenario, to present it in the form of a taxonomy, which, while not exhaustive, enables the organization of the issue.

Let us now approach this matter from a broader and more inclusive perspective. The phenomenon of *Verstehen* has two facets: one objective, referring to sense as that which is understood, and one subjective, referring to the very activity of understanding as inherently carried out by a subject. In various forms, but in both cases, a positive relationship between logic and hermeneutics can and should be contemplated.

If sense were purely subjective, and understanding were relegated to a subjective experience insurmountable in terms of possessing or lacking sense, then the gap between hermeneutics and logic would be equally unbridgeable. One field would address *Verstehen*, while the other would delve into forms and structures. If, on the side of logic and science, the object is prioritized, on the side of hermeneutics and phenomenology subjectivity is prioritized. However, given that sense fundamentally has both subjective and objective aspects, a phenomenological theory of *Verstehen* cannot exhaust the subjective aspect, nor can a logical theory fully encompass the objective aspect of sense. Both phenomenological and logical theories can address the two aspects of *Verstehen* – the objective and the subjective. In this context, let us now focus on logic, rather than in phenomenology or hermeneutics. Logic is thus tasked with the formalization of both aspects of *Verstehen* – the objective and the subjective. The former involves the study of sense relationships, while the latter involves the study of the dynamics of grasping and failing to grasp that sense. The question now is how to approach this in a more tangible manner.

6 SOME PROMISING EXISTING DEVELOPMENTS

The task of developing logic toward hermeneutics does not have to start from scratch, as existing logical developments offer resources poised for application in hermeneutics. In such applications, therefore, these resources can be further enriched and reconsidered.

The question is which logical theories developed in the 20th century could, in principle, prove useful in hermeneutics and find application. Deontic logic is obviously an exception here that will not be considered at this point, given its original conception with a clear relevance to philosophical issues central to hermeneutics. Thus, it falls into a distinct category. However, what about other theories? Why, despite not being initially designed for hermeneutics, are they pertinent? Essentially, any formal contribution directed toward a suitable formalization of finite rationality's nuances can, by extension, contribute to framing hermeneutical rationality more precisely. The characteristics of finite rationality crucial in hermeneutical rationality include the presuppositional, dialogical, contextual, and erotetic dimensions of discourse. Consequently, our focus should be on logics addressing these aspects.

Building on the differentiation between sense and truth value and, consequentially, between the objective and subjective facets of sense relationships, let us commence with an examination of the subjective aspect. Subsequently, we will examine the objective aspect before synthesizing both.

6.1. Epistemic Logics

Epistemic logics are characterized by addressing intensional contexts where the belief or knowledge that proposition p is true does not necessarily determine the truth value of p. Proposition p can be false, and it can be true that individual A believes that p. Now, if we start from the distinction between sense and truth value at the objective level, a corresponding distinction at the subjective level can be established between understanding and knowing. In this context, epistemic logics in the strict sense would focus on knowing, while "hermeneutical" logics would deal with understanding. Nevertheless, both hermeneutical and epistemic logics must be intensional. However, a fundamental difference arises between them. In the case of belief, one can believe truly or falsely. In contrast, regarding understanding, it is not just a matter of understanding correctly or incorrectly; there are nuances such as not understanding at all, understanding incorrectly due to grasping something else, or understanding with varying degrees of depth and accuracy, which might lead to a form of fuzzy logic. In summary, "*Verstehen und nicht verstehen*" [understanding and not understanding] – and not just believing, knowing and so on – should be the essential objects of epistemic logics. This introduces a set of complexities that significantly enrich such logics. For instance, for A to understand p, A might need to know or believe q, or A may understand p as False because A lacks knowledge of q, etc.

6.2. Logic of Pressupposition

Since Dilthey, hermeneutics has played a decisive role in critiquing what has been termed the "Archimedean point" or the "point of view from nowhere." For finite rationality, supposition and presupposition, including preconceptions (*Vorurteile*) in Gadamer's sense, are essential elements. The logic of presupposition, which initially emerged from the purely semantic considerations of Frege and Strawson, underwent significant development when it shifted to being fundamentally pragmatic. This shift acknowledged that effective communication always occurs within a context shared by

speakers, thus operating on presuppositions. Importantly, it is not only the pragmatic and dialogical context of natural language that operates on presuppositions, but human rationality as a whole. The act of supposing and presupposing is not limited to specific pragmatic contexts like dialogue; it is a constant in various cognitive activities such as thinking, interpreting a text, or developing any theory. Consequently, a logic of presupposition can offer a meaningful contribution within the framework of a theory of finite rationality.

Interestingly, when one starts from the pragmatic perspective of analyzing supposition based on "speech act theory", it becomes evident that what is being said extends beyond the speech situation and is applicable to reading, interpreting texts, as well as all forms of finite rational thinking. Consider the following:

> **Speakers** take a lot for granted. That is, they *presuppose* information. As we wrote this, we presupposed that **readers** would understand English. We also presupposed as we wrote the last sentence, repeated in (1), that there was a time when we wrote it, for otherwise the fronted phrase "as we wrote this" would not have identified a time interval. (Beaver, Denlinger: 2021, p. 2 my emphasis in bold).

In a reformulated theory of presupposition, a key consideration is that while it may focus extensively on truth or falsehood, it tends to relegate sense relationships to the background. At most, these relationships are viewed as pragmatic presuppositions. In the logical theory of presupposition, special attention must be given to the distinction between logical presupposition in the strict sense, which pertains to the truth value of a statement in relation to another, and presupposition of sense, which concerns the sense of a statement in relation to another or to its truth value.

6.3. Erotetic Logics

Undoubtedly, questioning and answering constitute fundamental attributes of ordinary language, warranting significant attention in the logical exploration of such language. These elements hold a crucial place in language not arbitrarily but because they are inherent traits of finite rationality. When we momentarily set aside contextual considerations, or perhaps expand them considerably, it becomes evident that questions make sense or do not make sense depending on specific presuppositions. Just as there is no "viewpoint from nowhere," there is no absolute question – one devoid of presuppositions. Furthermore, a question not only presupposes but, within its

presuppositions, alludes to a context that ultimately represents the dialogical context essential to finitude.

While erotetic logics are deemed crucial for hermeneutic logic due to their intrinsic connection to these aspects, this does not mean that all endeavors under this form of logic merit consideration, or even that what has been done so far represents what is indeed fundamental. Indeed, numerous erotetic logics may not extend beyond propositional logics adorned with question marks, often merely reiterating well-established theorems from other calculi at the level of interrogation.

6.4. Combined Logics

A hermeneutical logic not only incorporates logical theories expressly designed for its objectives or those with emerging possibilities but also has the potential to combine them, thereby enriching and extending their resources beyond their original domains. What's more, this integration is already in progress.

The theory of presupposition, while inherently intriguing and promising, gains even greater significance due to its inherent connections with erotetic, epistemic, and modal logics. To illustrate, consider a simple example from the Stanford Encyclopedia (Beaver, Denlinger, 2021) where an analysis of presuppositions involves elements of erotetic, epistemic, and modal logics:

(2) It's the knave that stole the tarts.
(3a) There is a (salient and identifiable) knave.
(3b) There were (salient and identifiable) tarts.
(3c) Somebody stole the tarts.
(4a) The knave did something illegal.
(4b) The knave took possession of the tarts.
Now consider the sentences in (5):
(5a) It isn't the knave that stole the tarts. (*negation*)
(5b) If it's the knave that stole the tarts, he will be punished. (*antecedent of a conditional*)
(5c) Is it the knave that stole the tarts? (*question*)
(5d) Maybe/It is possible that it's the knave that stole the tarts. (*possibility modal*)
(5e) Presumably/probably it's the knave that stole the tarts. (*evidential modal, probability adverb*)
(5f) The king thinks it's the knave that stole the tarts. (*belief operator*).

In addition to these brief references, there are more comprehensive and explicit endeavors in this direction. For example, consider the integration of presupposition logic

and erotetic logic by Marie Duzi. Duzi explains: "Presupposition is generally characterized as the information that is presupposed or taken for granted. Levinson characterizes a presupposition as a background belief, relating to an utterance that (a) must be mutually known or assumed by the speaker and addressee for the utterance to be considered appropriate in context, (b) generally will remain a necessary assumption whether the utterance is placed in the form of an assertion, denial, or question, and (c) can generally be associated with a specific lexical item or grammatical feature (*presupposition trigger*) in the utterance. Presupposition of a question is mostly defined by two conditions.

   a. *Usability*: the truth of a presupposition is a necessary condition for an interrogative act to be successful

   b. *Inference from possible answers*; presupposition of a question is entailed by each possible answer to the question" (Duzi, 2015).

But there is more. The noteworthy aspect of Duzi's text is that she not only links two logical theories developed independently – the logic of presupposition and the question – but places them in the broader horizon of Tichy's transparent intensional logic, or TIL.

Marie Duzi's article stands as a clear example of formal refinement, demonstrating an excellent understanding of all formal resources for addressing the problem. However, it operates within a limited philosophical horizon that the author neither perceives nor questions. Her primary interest lies in the purely formal question of clarifying how negation works in presupposition. Yet, if we start from the premise that what is essentially at stake in all these cases are aspects of a logic of finite rationality, we can connect the specific problem she addresses with other issues, such as those of hermeneutics and the production of sense itself, thereby giving them all greater philosophical relevance.

7 HERMENEUTICAL RATIONALITY AND "TEXT": APPLYING DISCOURSE LOGIC TO HERMENEUTICAL ACTIVITY [ANALYSIS]

Within Gadamer's hermeneutical project, his ambition to construct a universal method should not be overlooked. Such a method would involve establishing the elementary foundations and concepts applicable to all realms of *Verstehen*, encompassing art, law, religion, history, literary texts, philosophical texts, etc. While considering

Verstehen in all its dimensions might be, at first sight, desirable for a comprehensive understanding of the phenomenon, it is crucial not to confuse a desirable end with a reasonable starting point. Although a universal hermeneutics might be a desirable end, it does not appear to be a reasonable starting point methodologically. And even though Gadamer explicitly rejects the idea of hermeneutics as a "method," this does not exempt him from the need for a methodical approach. The universal claim in Gadamer's approach leads to obscurities, inaccuracies, and conceptual leaps that can compromise his endeavor. Concepts initially developed with clear reference to a limited domain, such as "application" (*Anwendung*) from Law, are soon generalized to art and philosophical texts, for instance, thus becoming progressively vague and inaccurate. Therefore, it is increasingly hard to discern how the initial intuition – which was both valuable and relevant, at first – is preserved through this expanded scope.

Contrary to the idea of a universal hermeneutics in the style of Gadamer, which, I insist, is evidently a desirable goal, I advocate for a rigorously methodical approach in its construction. This involves adhering to the wise principle of the second rule of the Cartesian method, which recommends dividing the difficulty into as many parts as possible.

In my "rational reconstruction of Gadamerian hermeneutics" (pardon the irony), I propose starting with the hermeneutics of the philosophical text and consistently using it as a reference. This involves gradually expanding it in a controlled manner, ensuring clarity in delineating relationships, shifts in meaning, emphasis, etc.

Let us begin by rethinking the relationship between hermeneutics and logic, using the hermeneutics of the philosophical text as a hermeneutical benchmark. The crucial aspect to leverage the resources offered by 20th-century logic in hermeneutics is to establish the relationship between the philosophical text and discourse in the realm of natural language. While it is evident that the latter essentially adopts the character of a dialogue, and therefore the logic of this discourse is always, in an extended sense, "dialogical logic," it is less apparent that the former is also a dialogue, irrespective of its external literary form. This is because, fundamentally, the dialogical character is an inherent aspect of finite rationality. Every text embodies a dialogue because finite rationality is essentially dialogical. Therefore, it is not merely a fortunate coincidence that

the formal resources developed for the analysis of ordinary discourse are significant for the analysis of philosophical texts and, consequently, for hermeneutics.

In summary, for establishing the relationship between logic and hermeneutics, methodically starting with the hermeneutics of the philosophical text

a. The first and most general premise is that human rationality is finite.

b. The second is that, in being finite, it is dialogical.

c. The third is that, in being dialogical, what is valid for the analysis of everyday discourse extends to the analysis of philosophical texts.

8 SPECIFIC ASPECTS OF HERMENEUTIC LOGIC

There are numerous questions surrounding the concept of a hermeneutic logic. While acknowledging that these questions may not be exhaustive, the following merit particular attention:

a. What constitutes making sense or lacking sense?

b. What things are deemed to make sense?

c. Is it possible to offer a basic taxonomy to categorize these meaningful things?

d. What relationships exist between things that make sense?

e. Is it feasible to establish a minimal taxonomic order of these relationships?

f. Is it possible to articulate a precise definition of the sense relationship, distinguishing it from others, such as logical consequence relationship?

g. Are there universal principles applicable to all sense relationships in general?

Let us take the first steps to address some of these questions.

8.1. Logical consequence and hermeneutic relevance

When we distill the essence of logic to its historical core, it becomes evident that, since Aristotle, its focal point has been to establish valid modes of inference, which were subsequently formalized and symbolized. In this context, logic's central object of study is the notion of consequence, specifically logical consequence. Logic, at its core, remains dedicated to analyzing the dynamics of consequential relationships, even within the realm of informal inference.[6] These relationships – of consequence, implication, and

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[6] But can we say that all existing logical theories today are really a study of consequence? Of course, in a certain way, yes, but it hinges on the precision that the very idea of what constitutes logical consequence

derivability – are fundamentally about truth-value relationships. The original notion of consequence denotes a relationship between truth values.

One may ponder whether it is feasible to draw relationships between senses in a manner akin to logical consequences. In other words, does the concept of logical consequence, perhaps in an expanded form, apply to sense, or is it confined to the realm of truth values?

This inquiry leads us to the contemplation of formal hermeneutic relationships, situated between purely algorithmic connections and the complete absence of formal relationships, where content dictates every relationship. Such purely formal hermeneutical relationships could be termed as relevance relationships. In this case, "relevance" indicates a sense relationship. For instance, inquiring about the number of students present elicits "3" as a relevant response. However, this relevance relationship extends beyond direct answers; a statement negating the presence of students altogether remains pertinent to the inquiry on the number of students in the classroom, even if there is effectively no inference in this case. This suggests that, within the logic of sense, the counterpart to inferential logic is the dichotomy between logical consequence and relevance. A is relevant in relation to B, or A makes sense in relation to B.

A critical advancement in this discussion might be to shift the focus on the relationship of consequence to emphasizing the relationship of presupposition. While understanding that one sense derives from another may present challenges, the concept of one sense presupposing another – i.e. that relationship A makes sense in relation to B – is intuitively graspable. For example, a question makes or lacks sense only within a certain context, based on certain presuppositions and on the truth value of other statements... This relationship between the meaningfulness of A, and B being true is unrelated to the dynamics of implication or truth-value relationships. Exploring the intricacies of these relationships reveals a rich field of study encompassed by logics of presupposition and erotetic logics.

Deductibility – Derivation or Consequence – Presupposition. Is it possible to formulate, in association with these three relationships, the notion of a sense relationship? Will I have to distinguish mere logical presupposition from a presupposition of sense?

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has changed. Perhaps the new logical systems define to some extent their own notion of consequence. Perhaps in this definition, the notion of truth value is not necessary.

Can all sense relationships somehow be reduced to relationships of presupposition? Not necessarily. A question has underlying presuppositions, granting relevance only to certain answers.

What are the fundamental formal distinctions between relationships of logical consequence and sense relationships?

- Relationships of logical consequence exclusively entail connections between truth values.

- Relationships of logical consequence are inherently relationships between propositions. Inferential relationships are constrained to propositions because only propositions can bear truth values. Conversely, sense relationships need not be confined solely to propositions but can encompass actions and other non-linguistic entities in general.

- Relationships of logical consequence are inherently necessary: from a given proposition *p*, various conclusions may follow, but these conclusions necessarily ensue. In contrast, sense relationships may operate within the realm of possibility. For instance, in response to a question, multiple answers may be deemed relevant. Logical consequences invariably entail necessity, whereas sense relationships may be only possible.

- Relationships of logical consequence proceed unidirectionally: they progress from the antecedent to the consequent. For instance, *q* logically follows from *p*, yet *p* is not examined in itself in its relation to *q*.

- Establishing unequivocal principles to determine the consequence in sense relationships may not always be possible, in contrast with implication and consequence relationships. However, it may be feasible to establish negative criteria, which delineate prohibited dialogical movements.

8.2. Sense and Linguistic Sense. Semantics and Hermeneutics

Thus far, we have juxtaposed sense with truth value and, grounded on this juxtaposition, concurrently interlinked hermeneutics and logic. However, the sense we have tacitly assumed thus far primarily pertains to the sense of propositions. Consequently, why not simply allude to semantics? Undoubtedly, nothing would hinder us, and indeed, it would be prudent to delineate the correlation between logic and semantics as an interim step in delineating the correlation between logic and hermeneutics. Nevertheless, even if this were the case, we cannot stop at semantics but must advance to hermeneutics. The rationale is evident. Clearly, not all sense pertains to propositional sense, and not solely propositions have the capacity to make or lack sense. Consequently, sense relationships are not invariably limited to connections between propositions; there can exist sense relationships that transcend propositions. *Verstehen* is not confined solely to the realm of language.

8.3. Formal Relationships between Senses

Let us presume the existence of sense relationships and the feasibility to reasonably determine their nature. The subsequent step revolves around determining whether these connections are mere specific instances or if they are governed by general underlying principles. Can criteria be established, at least in part, to govern sense relationships? More fundamentally, are they amenable to formalization? An apparent obstacle that may arise is as follows: Sense relationships invariably pertain to content. Hence, attempting to formalize these relationships would be tantamount to formalizing content relationships. While material relationships among senses are evident, the crux lies in discerning whether pure formal relationships also exist. The question is the extent to which pure sense relationships are amenable to formalization and whether universally applicable truths can be formulated about them. Notably, there are various forms of sense relationships that can be examined independently, potentially illuminating whether universally applicable principles govern all sense relationships.

8.4. Taxonomy of Sense Relationships

Can we systematically and exhaustively enumerate all sense relationships, or must we confine ourselves to listing them randomly? Is there a method to exhaustively classify them, or to organize them according to a systematic criterion? The examples below serve merely as illustrations to demonstrate the existence of sense relationships; they do not, however, establish the feasibility of formalizing them. A taxonomy of sense relationships should include, at minimum, the following categories:

a. Whole-and-part sense relationships.

As elucidated by Husserl, this is when a collection of senses either gives rise to a unified sense or does not.

b. Sense relationships in questions I: question and context.

Questions lack a truth value, yet they either make sense or do not within a given context.

c. Sense relationships in questions II: question and answer.

The connection between questions and answers represents a quintessential instance of sense relationships. Each question invites a set of meaningful answers, while others remain nonsensical. Notably, unlike in inference, there is no single correct answer. But be careful: from something, multiple outcomes can be deduced. Perhaps it is no different in this case. In scenarios where a question is answered with a simple "yes" or "no," such as "Is it raining?" both responses maintain a sense relationship with the question. Indeed, a question by itself cannot dictate a single definitive answer, which may be considered an inherent characteristic of all questions.

d. Sense relationships in questions III: question and presupposition.

When posing the question, "Which students are in the room?", the presence of students in the room is presupposed. Without students in the room, the question would not make sense. Crucially, the proposition "There are students in the room" does not logically entail a question, unlike one proposition that entails another. Here, there are linked elements of propositional structure, but not propositions themselves that are true or false.

While a question does not follow from a proposition, just as the question assumes the truth of the proposition, the truth of the proposition renders the question possible, modalizing it and making it meaningful. To examine the relationships between propositions and the questions made possible by them, modal logic is required. Making or lacking sense can be considered a specific instance of modalization.

e. Sense relationships in questions IV: question and question.

Questions are not always met with statements but sometimes with other questions. If someone inquires why I bought shoes, I may counter by asking why they believe I purchased shoes. In this case, "answering" with a question makes complete sense. Thus, there are sense relationships between questions; certain questions gain significance based on others, without presupposing a specific form of answer to the initial query.

f. Continuity in a dialogue.

During conversations, there exists a tacit acknowledgment of whether statements contribute to the ongoing dialogue or disrupt its flow. The phenomenon of discontinuity of sense can be explored from psychological or phenomenological perspectives, yet it also warrants examination at a logical level. Could there be "hermeneutic operators," akin to propositional connectives that regulate the dialogical game in dialogical logic?

In all likelihood, the formal relationships of sense in dialogues are broader and more overarching than those observed in question-answer interactions, which essentially represent a specific case of dialogue. Consequently, we might delineate a general category of sense relationships applicable to dialogues, alongside a subset specifically tailored to question-based interactions.

g. Reference of actions to a context.

The significance of any action is contingent upon its context, with certain sequences of actions being meaningful and others not. It is crucial to note that the sense relationship lies not between statements or meanings but rather among meaningful actions. Consequently, a fundamental division emerges between linguistic sense relationships and non-linguistic sense relationships.

However, considering language as a form of action may render this dichotomy obsolete. The theory of action (*Handlungstheorie*) would be one more chapter within a universal theory of sense. Crucial to this theory is the distinction between a mere event and a meaningful action, with the very concept of an act or action inherently tied to that of meaning.

While everything that is real may be subject to causal relationships, certain real things are also subject to meaningful relationships. For instance, when greeted, a meaningful response with another greeting ensues. It is the meaning behind one action that resonates with that of another, and not the real event that resonates with another event. In cases where a meaningful action lacks a corresponding meaningful response, an investigation into real causes, such as pathology, ensues.

Sense relationships can traverse the divide between the tangible and the conceptual, the spoken and the unspoken, such as in the interaction between actions and questions.

h. *The relationship of presupposition.*

Distinguishing between relationships of presupposition and relationships of implication.

8.5. Making sense of – making sense in relation to

It is crucial to make a clear distinction between two issues:

a. Defining the property of making sense.

b. Defining the relationship of making sense in relation to...

In a formal logic of sense, the primitive property would be "A makes sense in relation to B." This differs from truth-functional logic, where A and B are inherently true, forming formal relationships based on their truth values. Here, we introduce an elementary monadic predicate, "making sense," signifying that A makes sense, and a relational predicate, "making sense in relation to...". The outcome, however, differs from truth-functional logic, where A is inherently true, B is inherently true, and they have a relationship between them, which is ultimately the relationship of implication. This means that the truth of one necessarily implies the truth of the other. In a logic of sense, if A makes sense, it does not imply that B also makes sense, nor does the fact that A

makes sense give sense to B. "Making sense in relation to..." represents a relationship between A and B, not between the sense of A and the sense of B.

In the case of sense relationships between wholes and parts, it is assumed that the parts make sense on their own, and the whole may or may not make sense. However, the parts do not necessarily make sense with respect to the whole. Therefore, in this case, the sense relationship is formally different from the one that exists between a question and an answer, for example. This is because in this case, it is presupposed that both the question and the answer make sense independently, which, albeit being a necessary condition, does not guarantee that one makes sense in relation to the other. It is entirely possible that the question makes sense, the answer makes sense, and yet the answer does not make sense with respect to that question.

Moreover, particularly interesting in sense relationships is the treatment of their formal properties, such as their associative, commutative and other properties. For example, if a question A and an answer B make sense with respect to a question C, it does not follow that they make sense between each other or that answer B makes sense with respect to question A.

Either A makes sense in relation to B, or it does not make sense in relation to B. Similarly, either A makes total sense in relation to B, or it only makes partial sense in relation to B, and so forth.

8.6. Does a hermeneutic logic program call for a reformulation of the idea of logic?

In the context of hermeneutic logic, a final fundamental question arises regarding its relationship with conventional notions of "logic" and whether it would require a reevaluation of the very concept of logic itself.

Initially, we proposed an "expansion" of logic from a theory of inference to a theory of sense relationships. However, the notion of "expansion" may not adequately capture relevant theoretical complexities involved and could obscure significant problems, as it still presupposes a traditional, inherited idea of logic without due scrutiny. As noted previously, Husserl himself, in his discussions around a universal grammar, hints at the idea of a logic of sense. However, what is more important in Husserl's work and should be our starting point is his profound reflection on the concept of logic itself, aiming to transcend conventional frameworks and introduce crucial distinctions. This

endeavor by Husserl extends beyond his *Logische Untersuchungen* (1900) and continues prominently in his *Formale und transzendentale Logik* (1929)[7].

While the concept of a formal science traces back to Aristotle, the 19th century witnessed a significant shift as this idea transcended the borders of logic. During this period, there emerged a growing skepticism towards the rigid distinction between logic and mathematics, leading to the conception of formal science as an overarching framework encompassing both disciplines, thus establishing a continuum between them. But what defines a formal science? What is the common trait of all so-called formal sciences? At its core, it appears to involve the study of structures and their properties.

The assertion that formal sciences, universally understood, concern themselves with structures brings to the forefront discussions surrounding the Bourbaki program and the broader concept of mathematical structuralism. This debate has obviously seen numerous developments and remains far from achieving consensus. The notion that mathematics primarily deals with structures has faced significant pushback from those who view mathematics as a theory focused on objects, arguing that the objects within which structures manifest cannot be overlooked. This contention has roots in historical disputes such as the tension between Dedekind's and Frege's versions of logicism, extended into debates between figures like Russell and Natorp, Cassirer, and continues with contemporary thinkers like Putnam and Benacerraf.

The core issue revolves around the relationship between traditional logic, or simply "logic", and hermeneutic logic. Can the distinction between "logic" and "hermeneutic logic" be reduced merely to different aspects within a universal formal science concerned with various structures, thereby rendering logical and hermeneutic structures as specific instances of this broader field? Alternatively, might it be more appropriate to adopt a radical perspective, suggesting that "traditional logic" constitutes a segment of a broader discipline rightfully termed "formal hermeneutics", given that the logical process of inference is but one particular case of the universal sense relationship? Or would it be more accurate to recognize the existence of two different, formal sciences

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[7] This bold project of Husserl is linked to others that, in one way or another, propose the idea of new sciences, more general and abstract than the traditional existing ones, like Whitehead and universal algebra, etc. The idea of somehow formulating a more general science than logic, which would encompass classical logic only as one aspect or part, is in the air and takes extremely varied and sometimes seemingly disconnected forms.

that, despite being parallel and equally valid, remain fundamentally distinct and non-interchangeable?

9 CONCLUSION

We have laid out a thesis, elaborated on its various components, and laid the groundwork for its plausibility. Yet, what has been proposed is essentially a blueprint for a project requiring interdisciplinary collaboration and collective effort.

At its core, the argument posits that a theory of finite rationality – our own and the only kind we comprehend – must encompass both scientific-natural rationality and hermeneutic rationality. It advocates for the recognition that these are varied manifestations of overarching structures that warrant due formalization. In contrast, the antithesis of this endeavor would be a form of naturalistic hermeneutics that attempts to reduce the structures of hermeneutic rationality, such as the hermeneutic circle, to the confines of scientific-natural rationality, notably the hypothetico-deductive model. A century on from the pivotal discussions at Davos, pursuing this integrative path appears not only sensible but also full of potential.

REFERENCES

ÄQVIST, L. *A new approach to the logical theory of interrogatives*. Tübingen: Verlag Gunter Narr, 1975.

BEAVER, DAVID. J.; Denlinger, K. *Pressupossitions*. Stanford Encyclopedia of Philosophy, 2021.

CARNAP, R. *Überwindung der Metaphysik durch logische Analyse der Sprache*. Erkenntnis, pp. 219-241, 1931.

CARNAP, R. *Der logische Aufbau der Welt*. Berlin: Weltkreis-Verlag, 1928.

CUNNINGHAM, J. y GABBAY, D. M. Editorial. Logic. In: *Journal of the Interest Group in Pure and Applied Logic*, 9 (2); pp. 139-140, 2001.

DUZI, M. Questions, Answers and Presuppositions. In: *Computación y Sistemas*. Vol.19, Nr. 4, pp. 647-659, 2015.

FUENMAYOR, D. & BENZMÜLLER, C. Computational Hermeneutics: An Integrated Approach for the Logical Analysis of Natural-Language Arguments. In: *Logic in Asia*, pp. 187–207, 2019.

FRIEDMAN, M. *A parting of the ways. Carnap, Cassirer and Heidegger*. Chicago/La Salle (Illinois): Open Court, 2000.

GABBAY, D.; WOODKS, J. The new Logic. Logic. In: *Journal of the Interest Group in Pure and Applied Logic*, 9 (2), pp. 141-174, 2001.

GADAMER, H. *Wahrheit und Methode*. Tübingen: Mohr Siebeck, 1970.

GONZÁLEZ PORTA, M. A. A separação dos caminhos. Uma análise crítica do livro homônimo de Michael Friedman. In: *Estudos Neokantianos*. São Paulo: Loyola, pp. 229-250, 2011.

GONZÁLEZ PORTA, M. A. *Empirismo hermenêutico (para além de* A filosofia a partir de seus problemas*)*. São Paulo: Edições Loyola, 2025.

HACK, S. *Philosophy of logics*. Cambridge: Cambridge University Press, 1978.

HEIDEGGER., M. *Was ist Metaphysik?* Frankfurt am Main: Vittorio Klostermann, 1960.

HUSSERL, E. *Logische Untersuchungen. Prolegomena zur reinen Logik*. Ed. Elmar Holenstein. The Hague: Martinus Nijhoff, 1975.

HUSSERL, E. *Logische Untersuchungen. Untersuchungen zur Phänomenologie und Theorie der Erkenntnis*. In zwei Bänden. Ed. Ursula Panzer. rev. ed. 1922. The Hague: Martinus Nijhoff, 1984.

HUSSERL, E. *Formale und transzendentale Logik. Versuch einer Kritik der logischen Vernunft*. Ed. Paul Jansen. The Hague: Martinus Nijhoff, 1974.

KRALLMANN, D.; STICKERL, G.; (Hrsg.) *Zur Theorie der Frage*. Tübingen: Gunter Narr Verlag, 1978.

LENZEN, W. *Glauben, Wissen und Wahrscheinlichkeit*. Wien / New York: Springer, 1980.

LORENZEN, P. *Dialogische Logik*. Darmstadt: Wissenschaftliche Buchgesellschaft, 1978.

HARTMANN, D. *Konstruktive Fragelogic. Vom Elementarsatz zur Logik von Frage und Antwort*. Mannheim / Wien / Zürich: Wissenschaftsverlag, 1990.

LAZZER, S. Hacia una historia de la lógica de fines del siglo XX. In: Martins, R. A.; Martins, L. A. C. P.; Silva, C. C. Ferreira J. M. Eds. *Filosofia e história da ciência no cone sul*. 3er. Encontro. Campinas. AFHIC, pp. 438-445, 2003.

HASLE, P.; OHSTROM. P. *Temporal logic. From ancient ideas to artificial intelligence*. Dordrecht: Kluwer Academic Publishers, 1995.

HILPINNEN, R. (Hrsg.) *Deontic logic. Introductory and systematic readings*. Dordrecht: Kluwer Academic Publishers, 1971.

MANZAVINOS, C. *Naturalistic Hermeneutics*. Cambridge: Cambridge University Press, 2005.

MEGGLE. G. *Handlungstheoretische Semantic*. Berlin / New York: De Gruyter, 2010.

PRIEST, G. *An introduction to non-classical logic form if to is*. Cambridge: Cambridge University Press, 2008.

STELZNER, W. *Die Logik der Zustimmung. Historische und systematische Perspektiven epistemischer Logik*. Münster: Mentis, 2013.

STROHBACH, N. *Einführung in die Logik*. Darmstadt: Wissenschaftliche Buchgesellschaft, 2015.

WALTER, J. *Logik der Fragen*. Berlin, New York: De Gruyter, 1985.

VON WRIGHT, G. H. *Explanation and Understanding*. Ithaca, New York: Cornell University Press, 1971.

VON WRIGHT, G. H. *Handlung, Norm und Intention. Untersuchungen zur deontischen Logik*. Berlin: De Gruyter, 1977.