On Some Ambiguities in Avicenna’s Analysis of the Quantified Hypothetical Propositions

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Abstract:
In his analysis of the hypothetical propositions either conditional or disjunctive, provided in *al-Qiyās*, Avicenna introduces quantifiers in these propositions and distinguishes between universal and particular, affirmative and negative propositions, expressed e.g. as follows: ‘Whenever A is B, C is D’ or ‘Never when A is B, then C is D’. In addition, in section 7 of *al-Qiyās* ([2] pp. 361-384), he considers similar propositions whose elements are themselves quantified. For instance, we can have the following A-hypothetical conditional: “Whenever every A is B, then every C is D” or the following E-hypothetical conditional: “Never when every A is B, then some C is D” and so on. In chapter 1 of section 7 (pp. 361-372), he provides 64 (=16 x 4) different hypothetical conditional propositions by combining their A, E, I or O elements in all possible ways. He also says explicitly in that same section ([2], p. 362.6) that the logical oppositions (defined in [1]), namely, contradiction, contrariety, subcontrariety and subalternation hold between all these propositions. Now, these relations hold only under some conditions, whether in categorical or in hypothetical logic [which, in Avicenna’s frame, is parallel to categorical syllogistic]. For instance, there is no contrariety if both A and E have no import; contrariety holds only in other cases (see [3]), for instance, when A has an import while E has no import, which is the opinion defended by Avicenna in his categorical syllogistic.

However, when we consider Avicenna’s explanations and proofs, by which he wants to show that there are equivalences between some A and E propositions, for instance between ‘Whenever Every A is B, then Every C is D’ and ‘Never when Every A is B then not Every C is D’, we find that they presuppose that A-hypothetical conditional is expressed as ‘(∀s)(A₁s ⊃ A₂s)’, while E-hypothetical conditional is expressed as ‘(∀s)(A₁s ⊃ ~A₂s)’ (see [6] against [5]) and similarly for all other A and E hypothetical conditionals. This raises a problem, since when A and E are expressed in that way, contrariety does not hold and consequently subcontrariety and subalternation do not hold either.

So these explanations introduce some confusion in Avicenna’s analysis, since A-hypothetical conditional is given two different interpretations in the same section, namely, ‘(∃s) A₁s ∧ (∀s)(A₁s ⊃ A₂s)’ on the one hand [which is required to validate contrariety] (see [4]) and ‘(∀s)(A₁s ⊃ A₂s)’ on the other hand, which Avicenna uses to prove the equivalences between some A propositions and some E ones, and above all since these interpretations seem confused and are not distinguished clearly and explicitly. As a consequence, one cannot in the same time, admit the relations of the square and the equivalences that Avicenna wants to prove, for if the relations of the square hold, the equivalences do not hold and vice versa.

One has thus to solve this problem in order to validate the whole system. Fortunately, there are at least two solutions that can easily be found although they are not explicit in the text. The first one is to weaken the equivalences into implications so that those A hypothetical
propositions imply the \( E \) ones but \textit{not conversely}. In this way, both the relations of the square and the correspondences between some \( A \) propositions and some \( E \) ones are valid, and the whole system remains consistent and free of ambiguities. This requires the \( A \) propositions and consequently the \( O \) propositions to contain what Pr. Wilfrid Hodges calls the “augments” (see [7]) even in hypothetical logic. But it has the inconvenience of not accounting for the equivalences between conditional and disjunctive propositions.

The second one is to simply keep the two interpretations of \( A \) (and consequently of \( O \)) but distinguish explicitly between them and say that it is the \( A \)’s and \( O \)’s \textit{with the augments} that validate the relations of the square, while the \( A \)’s \textit{without} the augments validate the equivalences. This second solution is preferable if one takes into account the relations between conditional and disjunctive propositions.

References

[7] Hodges, Wilfrid, \textit{Mathematical Background to the Logic of Ibn Sīnā}, forthcoming. Available at: \url{http://www.wilfridhodges/arabic44}
Al-Fārābī and Avicenna on Dialectical Premises

While the nature of premises is not a central concern in modern formal logic, it is almost impossible to overestimate its importance in post-Aristotelian Ancient, Late Ancient and Medieval logic.

In *Topics* I 1 Aristotle famously distinguished between two major classes of propositions that can be used in valid arguments. Demonstrative premises on the one side “which get their trustworthiness through themselves rather than through other things”, and dialectical premises “which seem so to everyone, or to most people, or to the wise – to all of them, or to the most, or to the most famous and esteemed.”

After being neglected for a long time, Aristotle’s concept of *Endoxa* started to fascinate modern scholars beginning with Owen (1975), who notoriously regarded them as necessary starting points for any sort of scientific investigation. Likewise Barnes (1980: 501) described Aristotelian *Endoxa* as “beliefs that are latent in language but manifest in action”, and Nussbaum (1986: 47) even elevated them to “our common beliefs, usually revealed as in things we say.”

The question of the demarcation between demonstrative and dialectical premises already led to the most sophisticated and original developments of logic during the period of its Arabic Reception, namely the rearrangement of propositions according to their way of being believed and epistemically justified.

As pointed out by Black (2006) the contrast between different classes of premises drawn by al-Fārābī must be understood in terms of epistemic certainty (*al-yaqīn*) as layed down in Fārābī’s short treatise Ṣarāʾīṯ al-Yaqīn. This newly developed concept of an inherently epistemic criterion that admits different grades of certainty and, therefore, different ways of application within the sciences, had a broad influence on the later Arabic, Persian and Latin traditions of logic, as pointed out in the case of Avicenna by Strobino (2015).

However, contemporary research has so far mainly focused on the epistemic conditions of demonstrative premises, depicting dialectical premises as rather deficient, inferior and inappropriate for scientific purposes (cf. Black 1990 & 2006).

This paper will take a less dismissive approach in exploring the concept of dialectical premises (*al-muqaddamāt al-maṣḥūrat*) in the extant works of al-Fārābī and Avicenna. It will be shown how Fārābī’s seemingly different accounts on the nature and merits of dialectical premises can be unified and brought into agreement with his general view on the relation between logic and science.

As I will demonstrate, he makes use of his predecessors’ works such as Alexanders’ Commentary on the *Topics*, the Late Ancient Commentaries on the *Prior Analytics* and the logical works of Galen. Since Fārābī’s controversial account on the merits and uses of dialectical premises was then subjected to a searching criticism by Avicenna (for instance in the *Kitāb al-Ğadal* of his Šifā) my discussion will contribute to a better understanding concerning the major points of disagreement between the two philosophers. Furthermore, it will be seen that the necessity of integrating hypothetical syllogisms (usually associated with Aristotle’s *Topics*) into the Peripatetic logic of terms stimulated a reconsideration of both demonstrative and dialectical premises in the works of al-Fārābī and Avicenna.
References


Black, Deborah (2006): “Knowledge (‘Ilm) and Certitude (Yaqīn) in Al-Fārābī’s Epistemology” In: Arabic Sciences and Philosophy (16), pp. 11–45.


Averroes understanding of the 'per se' as an implicit, but fundamental criticism of Avicenna

Aristotle's *Posterior Analytics*, know as *Kitâb al-Burhân* in the Arabic speaking world, have been studied meticulously by the falâsifa, at least from Al-Fârâbî onwards. Both Averroes (1126-1198) and Avicenna (980-1037) wrote about it. An aspect that is of particular importance to both of these authors is the 'per se' ("καθ'αὑτό" in Greek; “bi-l- ḍâṭ” or “ḏâṭî” in Arabic), a topic that Aristotle develops in I, 4 of the *Posterior Analytics*. Aristotle takes the 'per se' to express a particular relation between a subject and its predicate, which is, put in a very general way, that a 'per se'-predicate holds of the subject it is predicated of in virtue of what the subject is in itself. Besides the fundamental role a 'per se'-predicate is thus very likely to play in scientific demonstration, both Averroes and Avicenna develop what they consider to be fundamental ontological implications of the 'per se'.

As R.Strobino (in relation to Avicenna) and C.Cerami (in relation to Averroes) have shown, their respective understanding of the 'per se' is indeed of central importance to their ontologies. Both authors use the 'per se' not only in order to establish their ontology as such, but also to provide an ontological framework that matches the epistemological demand of the 'knowability' of the world by the (human) intellect, thereby defending the legitimacy of science.

However, as is well known, Avicenna and Averroes are in fundamental disagreement and Averroes never stops attacking Avicenna, whose ontology he considers to be completely mistaken. Although many of the disagreements and the polemical attacks by Averroes are well documented, not enough attention has been paid to the way in which Averroes' understanding of the 'per se' relates to Avicenna's. Yet, given the central ontological and epistemological importance of the 'per se', it seems indispensable to take a closer look at how their respective accounts of the 'per se' interact.

I will try to show that Averroes' understanding of the 'per se' does indeed constitute an attempt to refute Avicenna as well as to establish a more viable alternative to the Avicennian understanding. In order to show this, I will, firstly, focus on Averroes' apparent criticism of Al-Fârâbî in his *Long Commentary on the Posterior Analytics*. One of the main aims of Averroes' criticism in his
commentary on *Posterior Analytics* I, 4 is what he identifies as a fourth sense of the 'per se', that is a predicate that holds necessarily but not essentially of its subject. This fourth sense is considered to be not a real 'per se', because, according to Averroes, a real 'per se' is one that holds both necessarily and essentially of its subject. Secondly, I will show that the actual aim of Averroes' criticism is what Avicenna takes to be a 'per se' in the second sense: a predicate that follows necessarily but not essentially from its subject. However, this criticism misses the mark insofar as Avicenna does not have the same fundamental understanding of the 'per se' as Averroes: a 'per se'-predicate does not hold both necessarily and essentially of its subject. Finally, I want to suggest that Averroes' criticism of Avicenna might nevertheless be justified. Averroes provides several examples that make Avicenna's overall understanding of the 'per se' seem to have epistemologically disastrous consequences: it makes the knowledge of the essences of things impossible for us.
The Reception of Post-Avicennan Logic in Syriac: Barhebraeus on Modal Logic and Reduplicative Syllogisms

Barhebraeus (1226-1286), eminent Syrian Orthodox theologian and polymath of the Syriac Renaissance, deals in the Prior Analytics of his Avicennan summa *Cream of Wisdom* (ܟܬܒܐ ܕܚܐܘܬ ܚܟܡܬܐ) extensively with modal logic and hypothetical syllogisms. The Prior Analytics is, as most of this compendium, still inedited.1

Basically, his logical system as in the Cream is generally Avicennan,2 though typically post-Avicennan in particular,3 which, for example, manifests in the inclusion of the fourth syllogistic figure.4

As an initial study of his Prior Analytics traced this fourth figure and other parts, at least for assertoric syllogisms, back to Fakhr al-Dīn al-Rāzī’s *al-Mulakhkhas*5 (12th/13th ct.), an influential Arabic Avicennan summa, an initial hypothesis was to assume the same text as a source also for his modal logic.

Recently, however, al-Abharī’s *Kashf al-haqāʾiq* (13th ct.) has been identified as an additional source text, in accordance with the situation for other books of Barhebraeus’s Cream, though there might still be further unidentified sources (besides al-Kātibī’s Shamsiyya).

Barhebraeus distinguishes thirteen modal premises in his Prior Analytics. He does not discuss, or at least mention, a distinction into fifteen premises, as does the Mulakhkhas. Though he does not list the particular premises in his Analytics, these thirteen premises can be found listed very briefly in his On Interpretation. Thus, a correspondence between the Syriac technical terms as used by Barhebraeus for the premises and the Avicennan Arabic ones6 can be tentatively given. This is of importance, as Barhebraeus’s text is one of very few instances, or even the only one, of a reception of post-Avicennan Arabic logic in Syriac. Though there are several earlier Syriac texts dealing with logic, both translations and commentaries,7 these are chiefly based on an Aristotelian system of logic without Avicennan introductions.

Another remarkable issue of a reception of Avicennan logic in Syriac is Barhebraeus’s inclusion of reduplicative syllogisms (*tenāyāt*, translating Arabic *istithnāʾī*), defined as “a syllogism that already actually contains the conclusion or its contradiction,” that is, as part of a premise. These syllogisms, which are a subclass of hypothetical, that is, conditional ones, are further distinguished according to the particular hypothetical premises they consist of. Barhebraeus’s subsequent division of reduplicative syllogisms, namely, into those composed of conjunctive, disjunctive-real,8 or disjunctive-non real premises, seems to be influenced by, though not completely matching with, both Fakhr al-Dīn al-Rāzī and al-Abharī. The presence of a further source text, which is unidentified yet, is quite likely here.

The paper will give a brief presentation of key elements of Barhebraeus’s modal logic and his dealing with reduplicative syllogisms (and, thereby, show his rootedness in post-Avicennan Arabic logic), attempt to

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1 A critical edition with English translation and commentary is in preparation.
4 This is not the case for the Pupils of the Eye, where he only deals with three figures, or the Tractate, where he deals with three only for modal syllogisms, though with four for assertorical syllogisms (which might be due to differing sources or an intentional simplification).
8 Assuming that Syriac *mārānāyā* stands for Arabic *haqīf*. However, as this logical meaning is not attested for the Syriac word elsewhere, this is a working hypothesis.
identify those modal premises which are not explicitly mentioned in the *Analytics* with the corresponding Arabic ones, and try to show the influences of both Fākhr al-Dīn al-Rāzī and al-Abharī, but also point to divergences that might likely stem from another Arabic source text.
Post-Avicennan Logicians on the Problem of Existential Import:  
The Case of Metathetic Propositions  

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This paper addresses discussions in post-Avicennan Arabic logic on the definition of metathetic propositions and their status in relation to existential import requirements, focusing on the arguments made by Fakhr al-Dīn al-Rāzī (d. 1210) and the counter-arguments by Qūṭb al-Dīn al-Rāzī (d. 1365), who both establish their positions in the framework drawn by the most prominent figure in the tradition of classical Arabic logic, Avicenna (d. 1037). In the latter’s works, the problem of the existential import requirement in metathetic propositions (ma’dūla) are thoroughly discussed, and Avicenna seems to have presumed the existential import as a truth-condition for affirmative propositions, and therefore, affirmative metathetic propositions. For Avicenna, in other words, an affirmative metathetic proposition presumes its subject-term’s possibly existent referent(s).

This issue was taken up as a problem in the later tradition, with Fakhr al-Dīn al-Rāzī critically responding to the issues raised by Avicenna regarding metathetic propositions and their existential import, and instigating a new cycle of debate in post-classical Arabic logic. According to Rāzī, there is no such thing as an affirmative metathetic proposition, and therefore their truth value does not depend upon the existence of their subject-terms. These criticisms led Arabic logicians to make qualifications and limitations over the absolute application of the existential import requirement to affirmative statements. In so doing, some logicians introduced a new classification of predicative propositions, dividing them into three categories: (1) external (khārijīyya), (2) mental (dhihiyya), and (3) real (haqīqiyya), thereby confining the existential import requirement to the first category. There were others who were uncompromising regarding their support for the Avicennan approach against later positions, most prominent among them being Qūṭb al-Dīn al-Rāzī, who took sides with Naṣīr al-Dīn al-Tūsī (d. 1274) concerning the latter’s defense of the Avicennan position against Fakhr al-Dīn al-Rāzī.

This paper will be a historical survey of this issue starting with the contentions made by Fakhr al-Dīn al-Rāzī and the counterarguments of Qūṭb al-Dīn al-Rāzī. It will then move to compare their arguments to the arguments made by Afdal al-Dīn al-Khunajī (d. 1248), Najm al-Dīn al-Kātibī (d. 1277), and Athīr al-Dīn al-Abharī (d. 1265) on the problem of the existential import requirement in metathetic propositions in their respective works. Through a study of this contained problem, this paper aims to address a wider scholarly concern regarding the vitality of post-classical Arabic logic. Until recently, it has been assumed that Arabic logic in the post-classical period entered a course of ossification, with logic becoming a mere tool of theological debate that was devoid of philosophical interest and value. By studying the issue of existential import in metathetic propositions, this paper seeks to problematize this thesis and to establish that in fact, this period was witness to the flourishing of philosophical debate among Arabic logicians.
Rāzī, Ūna ī, and Abharī on the Criticism of Definitions and Meno’s Paradox

In the twelfth century CE, Fār al-Dīn al-Rāzī (d. 1209) and Śīhāb al-Dīn al-Suhrawardī (d. 1191) simultaneously made two powerful attacks on the Avicennian-Aristotelian theory of definitions. Both criticized the traditional Peripatetic idea that we attain the conceptions of the essences of things by providing their genera and differentia. Both argued that the traditional Peripatetic approach to definitions barely provides us a way to analyze nominal definitions, let alone the real definition of extramental essences.

In my presentation I will focus on Rāzī’s criticism of definitions and responses to it that were provided by Af al-Dīn al-Ūna ī (d. 1248) and Aīr al-Dīn al-Abharī (d. 1264). Rāzī’s bases his attack on definitions on two arguments. The first argument effectively amounts to Meno’s paradox: if I already know a concept, I cannot seek for it anymore; if I do not know a concept, then I cannot seek for it either, since I do not know where to start and where to end my investigation. Rāzī denies the ancient Aristotelian solution to the paradox that inquiring into concepts is possible if we partially know them. The second argument makes use of taxonomic analysis. We may attain concepts either (1) by grasping all their parts; (2) or some of them; (3) or some of their extrinsic attributes. All these options are false. (1) Grasping something through all its parts amounts to grasping it through itself. (2) Knowing some parts of something does not give us full knowledge of it. (3) In order to grasp something through its extrinsic attributes we need to know that they belong to it specifically. This however requires that we already know the things to which they belong. Rāzī’s solution to both arguments is that we do not attain new concepts through definitions but rather explain already mind-present concepts which are sufficiently referred to through their proper names. As for the relation between these concepts and reality, it is not a concern of conception but assent.

According to our sources, Meno’s paradox was analyzed by certain Šaraf al-Dīn al-Maraḵī in terms of syllogistics. In Ūna ī’s report, one might have argued that from “Everything known cannot be sought” it follows through several logical operations that “Something that is not known can be sought for,” which however contradicts “Everything unknown cannot be sought.” In his response to Rāzī, Ūna ī specifically focuses on solving this apparent contradiction. He criticizes the
logical operation of obversion: “is not known” is not equivalent to “is unknown.” I will present Ūnaī's argument against obversion based on the analysis of being and existential import. Ūnaī himself defends the traditional Aristotelian solution based on partial knowledge.

Abharī in his turn focuses on the solution to Rāzī's second argument. (1) Basing himself on the mereological axiom that wholes do not equal their parts, he denies that grasping an essence through its parts amounts to grasping it in itself. (2) He claims that one can sufficiently know wholes through some of their parts as well. (3) Abharī also explains how we may grasp essences through their extrinsic attributes without having first learned what these essences are. In the end of my presentation, I will include an outline of the adherents and opponents of Rāzī's criticism of definitions in the thirteenth century.
Quṭb al-Dīn al-Rāzī al-Taḥtānī (d. 1364) on the Analysis of Atomic Propositions: Syntax, Semantics and the Copula

Abstract

Quṭb al-Dīn was arguably the most influential logician writing in Arabic in the 14th century. A student of Ibn al-Muṭahhar al-Ḥillī (d. 1325) and Quṭb al-Dīn al-Shirāzī (d. 1311), both of whom had studied with Naṣīr al-Dīn al-Ṭūsī (d. 1274), he redacted two commentaries, on Kātibī’s Shamsiyā (Epistle for Shams al-Dīn) and on ‘Urmawi’s Maṭālī’ī al-anwār (The Dawning of Lights) respectively, that became standard works used for the study of logic in madrasas until modern times. Systematic research on Quṭb al-Dīn’s logical works is still far and few between, but it has become apparent by now that Quṭb al-Dīn, who was broadly speaking an Avicennan, did in fact critically engage with a number of points of Avicennan logical doctrine, especially in his Lawāmi’ al-asrār bi-sharh Maṭālī’ī al-anwār (The Blazing Secrets in Commenting upon the Dawning of Lights). One such case in point is his extended discussion of the analysis of the semantics of single utterances and the syntax of the simple categorical statement. He shows a remarkably keen interest in logical syntax and semantics and appears to have been the first in this tradition to analyze atomic propositions into four parts, instead of three (subject, predicate, copula and judgment), thus explicitly distinguishing the judgment from the content of a proposition (like Frege’s judgment stroke) (see El-Rouayheb 2016).

In my paper I offer a reading of the relevant parts from Quṭb al-Dīn’s Lawāmi’, reconstructing the major threads of controversies regarding the semantics of name (ism), verb (kalima) and copula (rābiṭa), and the syntactic role of the copula in simple categorical statements. Largely prompted by the difficulties of translating Greek Aristotelian logic into an Arabic system and the confrontation with the Arabic grammatical tradition, Abū Naṣr al-Fārābī (d. 950) developed a deep mistrust in the features of natural language as representing logical form. He stipulates a number of syntactic constraints on well-formed statements, based on both metaphysical and semantic considerations, among which are: every well-formed philosophical statement needs a tenseless copula (’mawjūd’) to show that subject and predicate are so combined; the copula is a second intention; the predicate place is filled by copula + name, since every verb can be analyzed into ‘is Fīng’; unless the predicate is a prototypical name, the predicate can always be analyzed into copula + derived name (ism mushtaqq) and as such signifies a subject not articulated, of which it always paronymously predicates an attribute, never a genus; he was also the first to formulate a version of the principle of compositionality, according to which the meaning of a sentence is determined both by the meanings of its constituents and the structure of their arrangement.

I trace how these stipulations were discussed, modified or rejected by Avicenna and later al-Ṭūsī and al-Ḥillī. Quṭb al-Dīn in his commentary picks up on these discussions and, I argue, presents a new and unified picture of the analysis of atomic propositions. Besides distinguishing the judgment from the force of the copula, he provides a new semantic analysis of the copula, revises the theory of derived names, and discusses afresh the role of particles in logical syntax.
Existential Import and the Problem of Mental Existence

The Case of Sadr al-Sharia al-Mahbubi (d.747/1346)

The problem of mental existence in post-classical Islamic philosophy is deeply linked to the question of existential import in logic. In the Tajrid, Tusi (d.1274) famously argues from the truth of the essential proposition (haqiqiya) to show that what exists in the mind is in fact identical to the quiddity being judged. Later commentators on the problem of mental existence, such as Kemalpažazade (d.1534) and Taşköprizade (d.1561) dedicate sections of their respective treatises on mental existence to the truth conditions of the various types of propositions discussed in logic. Those who dissented against the strong mental existence view argued that (1) what exists in the mind is not the quiddity itself, but merely a simulacrum or a phantasm, and (2) it is not the object of knowledge, and therefore, there was no need to suppose that it was the quiddity itself.

The arguments in favor of mental existence often go like this: every affirmation of a positive predicate requires the existence of the subject; we make true affirmations of subjects that do not exist extramentally; therefore, they must exist in a distinct mode of existence in the mind, which they call mental existence. A typical counter argument is to say: if mental phenomena were identical to the quiddities then absurdities would follow (e.g., if thinking of heat entails that heat itself exists in the mind, then the mind would be hot). Therefore, what exists in the mind is merely a phantasm that is essentially distinct from the quiddity itself, and therefore, cannot serve as the object of knowledge that grounds the truth of the proposition. Curiously, they do not refer to the essential proposition as a means to defeat mental existence, despite its regimentation as a hypothetical proposition that does not require the existence of the subject.

In his Adjustment of the Sciences (Sharh Ta'dil al-'Ulm), Sadr al-Shari'a Ubaydullah b. Mas'ud al-Mahbubi makes a critical intervention that ultimately is not picked up by his contemporaries and subsequent authors until arguably the 18th century. Sadr al-Shari'a denies mental existence and reinterprets the essential proposition based on his understanding of the metaphysical thesis that: the existence of a quiddity is identical to the quiddity. Thus, in response to the need to ground the truth of essential propositions and other propositions, Sadr al-Shari’a employs the notion of ‘supposed/hypothetical existence’ (wujud taqdiri), such that these propositions are true in the following way: if a proposition ‘S is P’ is true, then it is true on the supposition of S’s existence extramentally. In other words, if S exists extramentally, then it is P. On this, the supposed existence is sufficient, and therefore, one does need to posit a distinct realm for the ‘existence’ of non-existent entities.

In this paper, I will present in detail Sadr al-Shari’a’s analysis of mental existence in reference to some of his predecessors, and some objections that have been made to his thesis. In doing so, I shall discuss his analysis of the essential proposition in relation to mental existence.