Galen's Institutio logica and al-Fārābī's logic. A reassessment of parallelisms that show a possible influence

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Galen's Institutio Logica and al-Fārābī's Logic. A Reassessment of Parallelisms That Show a Possible Influence

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Abstract

The aim of the following paper is to evaluate a possible influence of Galen's *Institutio logica* on al-Farabi's logic, following Zimmermann's and Lameer's evidence for some parallelisms between them. Among the scholars studying al-Farabi's logic, we find at least two authors that affirm such a textual relation, Zimmermann[1] and Lameer.[2] However, this influence is explicitly denied at least by Hodges,[3] another scholar studying on al-Farabi's logic. This paper will focus on establishing what are the arguments for this influence, in Zimmermann's and Lameer's terms, and then re-evaluate the possibility of this influence after comparing al-Farabi's and Galen's writings.

Keywords: al-Farabi, Galen, history of logic, history of philosophy, Graeco-Arabica

Özet

Galen'in Institutio logica ve Farabi'nin mantığı. Olası bir etki gösteren paralelliklerin yeniden değerlendirilmesi

Bu makalenin amacı, Zimmermann ve Lameer'in aralarındaki bazı paralelliklere dair delillerini takip ederek, Galen'in *Institutio Logica*'sının Farabi'nin mantığı üzerindeki olası etkisini değerlendirmektir. Farabi mantığı üzerine çalışan akademisyenler arasında böyle bir metinsel ilişkiyi onaylayan en az iki yazar buluyoruz: Zimmermann[4] ve Lameer.[5] Ancak bu etki, en azından Farabi'nin mantığını

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[1] Zimmermann, "Introduction".

[2] Lameer, *Al-Farabi And Aristotelian Syllogistics*.

[3] Hodges, "Introduction".

[4] Fritz Zimmermann, "Introduction: Al-Farabi's Theory of Propositions in its Doctrinal Setting", *Al-Farabi's Commentary and Short Treatise on Aristotle's De interpretatione*, auth. Abu Nasr al-Farabi, ed. & trans. Fritz Zimmermann (Oxford: Oxford University Press, 1981).

[5] Joep Lameer, *Al-Farabi And Aristotelian Syllogistics: Greek Theory and Islamic Practice* (New York: E.J. Brill, 1994).

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inceleyen bir diğer araştırmacı olan Hodges[6] tarafından açıkça reddedilmektedir. Bu makale, Zimmermann ve Lameer'in terimleriyle bu etkinin argümanlarının ne olduğunu ortaya koymaya odaklanacak ve ardından Farabi ve Galen'in yazılarını karşılaştırdıktan sonra bu etkinin olasılığını yeniden değerlendirecektir.

Anahtar Kelimeler: Farabi, Galen, mantık tarihi, felsefe tarihi, Yunanca-Arapça

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1. Introduction

Among the scholars studying on al-Farabi's work both Zimmermann[7] and Lameer[8] claim that al-Farabi can be said to have had access to the *Institutio logica* in addition to the *De demonstratione* (the latter being a text of which al-Farabi speaks explicitly). Zimmermann[9] claims that one evidence for this fact is that al-Farabi expounds the doctrine of *akolouthia* (in Arabic: *luzūm*) and *makhé* (in Arabic: *' inād*) in his paraphrase to the *Categories*,[10] but he also claims that we can see in his commentary on *De interpretatione*[11] that "al-Farabi seems to reject Galen's criticism of Stoic formalism".[12] This rejection presupposes that al-Farabi was somehow aware of Galen's position on the matter in the *Institutio logica*. On the other hand, Lameer[13] claims that the demonstration of Bocardo in al-Farabi's short commentary to the *Prior Analytics* closely follows the demonstration presented by Galen in *Institutio logica*.[14] We can see, however, a total opposite view of the matter in Hodges,[15] who in his introduction to al-

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[6] Wilfrid Hodges, "Introduction", *Syllogism: An Abridgement of Aristotle's Prior Analytics*. auth. Abu Nasr al-Farabi. trans. Saloua Chatti & Wilfrid Hodges (London: Bloomsbury, 2020).

[7] Zimmermann, "Introduction".

[8] Lameer, *Al-Farabi And Aristotelian Syllogistics*.

[9] Zimmermann, "Introduction", lxxxiii.

[10] Abu Nasr Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", trans. Douglas Dunlop, *Islamic Quarterly* 5/1 (1959), 34-35; 50-52 (56-58).

[11] Particularly in Abu Nasr al-Farabi, *Al-Farabi's Commentary and Short Treatise on Aristotle's De Interpretatione*, trans. Fritz Zimmermann (Oxford: Oxford University Press, 1981), 62 (68.7-9).

[12] Zimmermann, "Introduction", xl.

[13] Lameer, *Al-Farabi And Aristotelian Syllogistics*, 131.

[14] Galen, *Galeni Institutio Logica*, ed. Karl Kalbfleisch (Leipzig: B. G. Teubner, 1896), 24 (X.8).

[15] Hodges, "Introduction", 12.

Farabi's commentary to the *Prior Analytics* states without much explanation that the *Institutio logica* "never appears in Arabic records."[16]

Regarding the Arabic sources, the influence of Galen's *Institutio logica* in al-Farabi is, at least, possible. Certainly, if we take a look to the *Letter of Hunayn Ibn Ishaq to Ali Ibn Yahya about the books of Galen that have been translated to his knowledge and some of those that have not been translated* (*Risāla Ḥunayn bin Isḥāq ilā 'Alī bin Yaḥyā fī dhukr mā turjima min kutub Jālīnūs bi 'ilmihi wa ba'da mā lam yutarjamu*), a book where the famous Syriac translator and physician Hunayn Ibn Ishaq tells how he obtained some of Galen's books, which books he translated and which he did not, we can notice that the *Institutio logica* is indeed mentioned. Zimmermann already noticed this in his introduction: "We learn from Hunayn that in addition to the *De demonstratione*, he and his associates translated the *Institutio logica* and a short piece on the number of syllogisms".[17] Indeed, we can see that in Hunayn Ibn Ishaq's text the following is stated:

> His book [i.e., Galen's book] *On the Introduction to Logic* (*fī al-madkhal ilā al-mantiq*): This book is a single treatise in which are pointed out (*bayyan*) the things which those who are learning (*al-muta'allimūn*) need and those from which they can benefit in the science of demonstration. I have translated it into Syriac and Hubaysh translated it to Muhammad Ibn Musa into Arabic. Hunayn collated and improved it for 'Ali Ibn Yahya.[18]

Both the fact that it consisted of a single book, that Ibn Ishaq says that it contains the elementary things for those who are being initiated in the art of logic and that their titles are equivalent seem to indicate that this book, *On the Introduction to Logic* (*fī al-madkhal ilā al-mantiq*), corresponds to the book that has come down to us under the Greek title of *Eisagogé dialektiké*, that is, in Latin, *Institutio logica*. The existence of this book is further confirmed in another Arabic source, the famous *Kitab al-Fihrist* of

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[16] Consulted on this point, professor Dr. Hodges stated in a personal communication that while indeed the *Institutio logica* appears to be consigned both in the *Kitab al-Fihrist*, and in the account of Hunayn Ibn Ishaq's translations, the fact remains that there is no record of al-Farabi ever having read it. We are very grateful for professor Hodges' insights on this matter.

[17] Zimmermann, "Introduction", lxxxi.

[18] Hunayn Ibn Ishaq, *Hunain Ibn Ishaq. Über die Syrischen und Arabischen Galen-Übersetzungen*, ed. Gotthelf Bergsträsser (Leipzig: Deutschen Morgenländischen Gesellschaft, 1925), 50 (26r).

al-Nadim, better known as al-Nadim's catalogue of books, a tenth century bookseller's catalogue frequently used to see what books were available at the time. The existence of a translation of a book by Galen called *Introduction to Logic* (*fī al-madkhal ilā al-mantiq*) by Hubaysh, disciple of Hunayn Ibn Ishaq, is also mentioned there.[19]

Al-Farabi, then, at least *could* have read Galen's *Institutio logica*. The thing is that al-Farabi does not quote explicitly the *Institutio logica*. In the following pages we are going to consider three main arguments that we may form from secondary literature, and we will evaluate them in light of al-Farabi's own work.

We have to speak, however, of a difficulty that emerges in trying to establish this issue. As Morrison shows in his article on Galen's logic,[20] the book that is extant to us as *Eisagogé dialektiké* is probably described by Galen in his *De libris propriis* as a "*summary of the theory of demonstration*, in one book".[21] If the *Institutio logica* is indeed a summary of *De demonstratione* (a book that al-Farabi quotes explicitly), it could be very well possible that we could be misrepresenting the possible evidence that we could gather for al-Farabi's reading of the *Institutio logica*. Since we don't have access to neither works in Arabic, and we don't have access to the *De demonstratione* at all, it is impossible for the time being to distinguish between the exposition made of a subject in the *Institutio logica* from the one made in the *De demonstratione*. For this reason, what we will be asking ourselves here is whether al-Farabi is aware of what has been said in the *Institutio logica*, even though it could still be possible that he didn't read that particular text.

2. Conflict and consequence in Galen and al-Farabi

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[19] Muhammad Ibn al-Nadim, *The Fihrist of al-Nadim; a tenth-century survey of Muslim culture.* ed. & trans. Bayard Dodge (New York: Columbia University Press, 1970), 685.
[20] Ben Morrison, "Logic", *The Cambridge Companion to Galen*, ed. Robert Hankinson, (Cambridge: Cambridge University Press, 2008), 85.
[21] Morrison, "Logic", 68.

The first passage in which Zimmermann seems to point at the *Institutio logica* or its contents as a possible source for al-Farabi is the following:

> Yet despite the philosophers' hostility [to Galen] some of Galen's logical teaching insinuated itself into their own. Two correlative pairs of concepts -complete consequence ($p \leftrightarrow q$) and incomplete consequence ($p \rightarrow q$), complete conflict ($p \leftrightarrow$ not-q) and incomplete conflict ($p \rightarrow$ not-q)- which among the known Greek texts accessible to the Arabs occur only in the *Institutio Logica* appear in al-Farabi's writings as firmly integrated items of his technical armoury.[22]

In a footnote to this passage, Zimmermann states that in al-Farabi's commentary to *De interpretatione* we can find the expression "complete consequence", whose complete theoretical framework can be found in a passage of al-Farabi's paraphrase to the *Categories*. There, al-Farabi states the following about consequence:

> The consequents by necessity [*al-mutalāzimāni bi-idṭarār*] are of two kinds, one kind complete in consequence [*tamm al-luzūm*], and another not complete [*ghayr tamm al-luzūm*]. Those of which the consequence is complete are those which, when either of them exists [*wujida ayyuhumā ittafaqa*], the other is found to exist necessarily [*wujida al-akhar bi-wujūdihi ḍarūratan*]. This means that when the first of them exists [*al-awwal minhumā idha wujida*], the second exists necessarily [*wujida al-thani ḍarūratan*], and when the second exists, the first exists necessarily. Those of which the consequence is not complete are those which, when the first of them exists, the second exists necessarily, but when the second exists, the existence of the first does not necessarily follow. These are those which are not equivalent in consequence of existence [*la yatakāfa'āni fi luzūm al-wujūd*] like man and animal, for when man exists, animal exists necessarily, but when animal exists it does not necessarily follow that man exists.[23]

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[22] Zimmermann, "Introduction", lxxxiii.

[23] Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", 34, 51 (57). In all references to al-Farabi's paraphrase of the *Categories*, we use Dunlop's translation with some modifications when necessary.

On this account, consequence is a relationship between terms rather than a kind of proposition, [24] things from which conditional propositions are construed. Additionally, the difference between consequents "complete in consequence" [*tamm al-luzūm*] and "incomplete in consequence" [*ghayr tamm al-luzūm*] is that the first relation is reciprocal whereas the second is not. From a complete consequence you can derive the first consequent from the second or the second from the first, whereas from an incomplete consequence you only can derive the second consequent from the first. The example provided by al-Farabi is from the second kind: the existence of "man" entails the existence of "animal", but not vice versa. Further, al-Farabi will say that there is a difference between consequents (*mutalāzimāni*) and correlatives (*muḍāfāni*) in the following manner:

> If they are taken in two subjects, they are not consequents [*mutalāzimayni*], but rather correlatives [*muḍāfayni*]. So if one of them exists in a subject, it will follow by necessity that the other exists in another subject. An example of this is the father and the son: if Zayd is a son, it follows necessarily that he has a father, and if Amr is a father, it follows necessarily that he has a son. That is why the correlatives become consequents [*li-dhalika yaṣīru al-muḍāfāni mutalāzimayni*]: if they are taken in two subjects, then the connective conditional [*ash-sharṭiyya al-muttaṣila*] is composed from them; and if they are taken in a unique subject, the divisive conditional [*ash-sharṭiyya al-munfaṣila*] is composed from them. [25]

From this passage, it seems that the difference between correlatives and consequents is made from its application. If that which is considered are thing, i.e. "real things", such as a father and a son, those are correlatives. Insofar as they are considered for the construction of a conditional (*ash-sharṭiyya al-muttaṣila*) or a disjunctive (*ash-sharṭiyya al-munfaṣila*), however, they "become" consequents. That's probably why the example given by al-Farabi for incomplete consequence is "man" and "animal", since their consecutiveness is made on the basis of them being terms.

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[24] For a more careful study of these passages, see Kamran Karimullah, "Alfarabi on conditionals", *Arabic Sciences and Philosophy* 24 (2014), 211-267.

[25] Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", 35, 52 (58).

On the other hand, al-Farabi presents the incompatibles (*al-muta'ānidāni*) in the following manner:

> Similarly the incompatibles are of two kinds, a kind of which their incompatibility is complete [*'ināduhumā tamm*], and the other of which their incompatibility is not complete [*'ināduhumā ghayr tamm*]. The completely incompatible [*at-tamm li-'inādihimā*] are two things which, when either of them exists, the other is removed [*irtafa'a*], and when either of them is removed, the other exists. The incompletely incompatible [*ghayr at-tamm*] are two things which, when one of them is removed whichever it is, the existence of the other does not follow necessarily. Therefore the incompatibles may be taken in the opposite way and reckoned among the consequents [*lawāzim*], when the removal of the second of them follows necessarily from the existence of the first, and similarly when the second exists, there follows also the removal of the first.[26]

The relationship of incompatibility (*'ināad*) is that in which two thing "repel" each other. It can be complete (*at-tamm li al-'ināad*), and in that case either thing exists when the other thing does not, and either thing does not exist when the other does, and it can also be incomplete (*ghayr at-tammi li al-'ināad*) in which case the presence or absence of one of the incompatibles implies the absence or presence of the other. The so called "divisive conditional" or disjunctive propositions are formed from incompatibles, and the example given by al-Farabi is "If this number is even, it is not odd [*idhā hādhā al-'adad zawjan fa-huwa laysa bi-fard*]", where the incompatibility seems again to lie in terms ("even" and "odd").

If we look into Galen's *Institutio logica* to find parallel passages, one finds himself in a difficult position. Galen's book is full of digressions of different kinds, to the point that we cannot find a single or a couple of single paragraphs concerning consequence and incompatibility. Some of the corresponding passages of Galen's *Institutio logica* that we can select state the following:

> Another kind of premisses is of those in which we make an assertion not about the being of things, but about the fact that if one thing, another is, or, if one thing is not, another is; let such propositions be called "conditional" [*hypothetikai*]; one class of

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[26] Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", 35, 51 (58).

these, "the [conditional] by connection [*kata synekheian*]" is whenever one says "if some other thing is, necessarily this thing is"; the other class, the "divisive [*diairêtikai*] [conditional]," is whenever, if one thing is not, another is or if one thing is, another is not.[27]

Now this state of affairs [*physis*] is a sign of complete conflict [*teleian makhên*]; but the other, as in, "If Dion is at Athens, he is not on the Isthmus," shows incomplete conflict [*ellipê makhê*].[28]

There will be two syllogisms deriving from complete consequence [*teleias akolouthias*], and another two from complete conflict [*teleias makhês*].[29]

As we can see, the order of exposition is very different from one writing to the other. Anyone who has read the *Institutio logica* can vouch for its disorderly manner of treating some of its subjects, and the explanation of consequence and conflict is no exception. It would be possible that al-Farabi systematized what was written in Galen's text on this terms. However, the meaning of these concepts are not systematized by Galen in the same way. For Galen, consequence and conflict, whose Greek names, *akolouthia* and *makhê*, are surely the basis for the Arabic *luzūm* and *'inād*, are not relationships between terms, but rather relationships between things, and it is from things related in this way that we construe the "conditional proposition by connection" (*kata synekheian hypothêtikê protasis*) and the "divisive conditional proposition" (*diairêtikê hypothêtikê protasis*), what we would today call "conditional" and "disjunctive" respectively, and al-Farabi calls "connective conditional" (*ash-shartiyya al-muttasila*) and "divisive conditional" (*ash-shartiyya al-munfasila*).[30] This proximity in the concepts used could mean that al-Farabi

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[27] Galen, *Galeni Institutio Logica*, 7 (III.1); Galen, *Galen's Institutio Logica: English Translation, Introduction, and Commentary*, ed. & trans. John Kieffer (Baltimore: Johns Hopkins University Press, 1964), 33. In all references to Galen's text, we use Kieffer's translation with some modifications when necessary.

[28] Galen, *Galeni Institutio Logica*, 9 (IV.1); Galen, *Galen's Institutio Logica*, 34.

[29] Galen, *Galeni Institutio Logica*, 34 (XIV.11); Galen, *Galen's Institutio Logica*, 47.

[30] We omit here the names that the *neôteroi* ("the recent ones", according to the words of Galen, where he means most likely the Stoics) have chosen for the conditional and the disjunctive: the conditional proposition (*synêmmenon axioma*) and the disjunctive proposition (*diezeugmenon axioma*).

is indeed working with the same vocabulary, and he could have borrowed that vocabulary from the *Institutio logica*.[31]

However, if we take a look at the examples, we can see that the examples given by al-Farabi do not match those given by Galen. The examples for propositions that express conflict and consequence in Galen are the following:

"If it is day, the sun is above the earth" [complete consequence][32]

"Either it is day or it is night" [complete conflict][33]

"If it is not day, it is night" [complete conflict][34]

"If it is not night, it is day" [complete conflict][35]

"If Dion is in Athens, Dion is not in Isthmus" [partial conflict][36]

"Dion is not both in Athens and in Isthmus" [partial conflict][37]

"Dion walks and Theon talks" [neither consequence nor conflict][38]

On the other hand al-Farabi's examples are the following:

"If Zayd comes, Amr departs" [accidentally consequent][39]

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[31] In al-Farabi's *Kitāb al-qiyās* and *Kitāb al-qiyās aṣ-ṣaghīr*, though there is no mention of a relation between complete or incomplete consequence, there is a mention of complete and incomplete conflict. See Abu Nasr al-Farabi, *Al-mantiq 'inda l-Fārābī*, ed. Rafiq al-'Ajam (Beirut: Dar al-Mashreq, 1986), 2/32-33 and 2/83-86 respectively. It should be noted that there too, the divisive conditional is composed of things that are in a relation of conflict (and so, the conflict is not in itself the divisive conditional): "the conditional [*ash-sharṭiyya*] is composed from two incompatible parts [*juz'ayn mutaʿādinayn*] or [more] incompatible parts", al-Farabi, *Al-mantiq 'inda l-Fārābī*, 2/32.

[32] Galen, *Galeni Institutio Logica*, 9 (III.4); Galen, *Galen's Institutio Logica*, 34.

[33] Galen, *Galeni Institutio Logica*, 9 (III.4); Galen, *Galen's Institutio Logica*, 34.

[34] Galen, *Galeni Institutio Logica*, 9 (III.5); Galen, *Galen's Institutio Logica*, 34.

[35] Galen, *Galeni Institutio Logica*, 9 (III.5); Galen, *Galen's Institutio Logica*, 34.

[36] Galen, *Galeni Institutio Logica*, 9 (IV.1); Galen, *Galen's Institutio Logica*, 34.

[37] Galen, *Galeni Institutio Logica*, 10 (IV.4); Galen, *Galen's Institutio Logica*, 35.

[38] Galen, *Galeni Institutio Logica*, 10 (IV.4); Galen, *Galen's Institutio Logica*, 35.

[39] Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", 34, 50 (56).

"When Sirius rises in the morning, the heat will be severe and the rains will cease" [essentially consequent for the most part][40]

"When man exists, animal exists necessarily, but when animal exists it does not necessarily follow that man exists" [partial consequence][41]

"If Zayd is a son, it follows necessarily that he has a father and if 'Amr is a father, it follows necessarily that he has a son" [complete consequence, but with the precautions mentioned above][42]

"If this number is even, it is not odd" [complete incompatibility][43]

Comparing the differences between Galen's and al-Farabi's examples, we can note first of all that the propositions construed from consequence or conflict in the *Institutio logica* follow typical Stoic examples, in most cases with the propositions "it is day" or "it is night" in place of variables, whereas in al-Farabi's examples variables are mostly replaced with terms, "animal", "man", "even", "odd". In the case of those propositions which were "consequence by accident" (*luzūm bi al-'arad*), the example given by al-Farabi has no equivalent in Galen, and Galen's example of a conjunctive proposition which represents a relationship between two things that are neither consequence nor conflict, "Dion walks and Theon talks", has no equivalent in al-Farabi's paraphrase of the *Categories*.[44] Another important difference is that for Galen, the propositions "Either it is day or it is night" and "If it is not day, it is night" are considered as formed from a complete conflict, whereas for al-Farabi disjunctive propositions are formed from incompatibility and conditionals from consequence. Regarding the partial conflict example "Dion is not both in Athens and in Isthmus", it seems that there is no equivalent in al-Farabi's paraphrase on the *Categories*.

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[40] Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", 34, 50-51 (56).

[41] Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", 34, 51 (57).

[42] Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", 35, 52 (58).

[43] Al-Farabi, "Al-Farabi's Paraphrase of the 'Categories' of Aristotle", 35, 52 (58).

[44] A similar sentence though can be found in al-Farabi's *Book of Rhetoric*: "Zayd doesn't walk until 'Amr talks [*wa lā yamshī zayd hattā yatakallam 'amrū*]", Abu Nasr al-Farabi, *Kitāb fī al-mantiq: al-khaṭāba*, ed. Muhammad Salim Salim (Cairo: Maṭba'a dār al-kutub, 1976), 50. However, the only thing similar between Galen's passage and al-Farabi's is the similarity of these examples, and these are typical Stoic examples, so it is difficult to see a clear connexion between both.

However, it is important to note that similar examples can be found in al-Farabi's *Book of Rhetoric*, without however the connection to the concepts of consequence and conflict: "Zayd is not both being in Iraq and being in Syria [*laysa yakūn zayd bi-al-ʿirāq wa-huwa bi-al-shām*]".[45] There, al-Farabi mentions this kind of proposition as the "divisive conditional [*al-sharṭiyya al-munfaṣila*]" proposition used "in the negative way [*ʿala jiha al-salb*]". In the *Kitāb al-qiyās*, al-Farabi gives the same example and notes that "when the conflict is not complete, the custom is to not use the particle "or" [*immā*], but rather to attach to the sentence something that indicates that the incompatibles cannot be together".[46] This explanation is not however present in Galen's text, so the proximity between al-Farabi and Galen on partial conflict is hardly enough to see a possible influence from the latter into the former.

Given this very big differences, one can only surmise that the source for al-Farabi's doctrine of consequence and incompatibility must be a different one from Galen's *Institutio logica*. Surely, both doctrines are connected somehow, as we can see from the parallelism between the names given to relations, propositions, and some examples, but it is very probable that the source for al-Farabi is an Aristotelian one. The place in which the consequents are explained in al-Farabi's paraphrase is also relevant: just before talking about the *Categories'* prior/posterior and simultaneous, and just after talking about opposition. In fact, al-Farabi mentions, when talking about consequence, things that are "not equivalent in the consequence of existence" (*la yatakafaʾāni fi luzūm al-wujūd*) which is a direct quote of Aristotle's *Categories'* chapter on priority: "that which has no reciprocity in the consequence of being" (*to mê antistrephon kata ten tou einai akolouthein*).[47] If a doctrine of consequence and conflict rose up among Aristotelians[48] this would be the natural place, and

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[45] Al-Farabi, *Kitāb fī al-mantiq: al-khaṭāba*, 49.

[46] Al-Farabi, *Al-mantiq ʿinda l-Fārābī*, 2/32.

[47] Aristotle, *Aristotelis Categoriae et Liber De Interpretatione*, ed. Lorenzo Minio-Paluello. (Oxford: Oxford University Press, 1949), 41 (*Categories* 14a30).

[48] On this subject, see Susanne Bobzien, "Pre-Stoic Hypothetical Syllogistic in Galen's *Institutio logica*", *Bulletin of the Institute of Classical Studies Supplement* 77 (2002), 57-72; and Id., "Peripatetic Hypothetical Syllogistic in Galen", *Rhizai. A Journal for Ancient Philosophy and Science* 2 (2004), 57-102. Al-Farabi's own remarks reaffirms the existence of such early Aristotelian development of hypothetical syllogism: "The Stoics, such as Chrysippus and others, have gone into this to the point of exaggeration, by making an exhaustive study of the subject of hypothetical

it is then probably that it is on the commentary tradition that Galen and al-Farabi are drawing from.

3. Al-Farabi's alleged rejection of Galen's criticism of Stoic formalism

A second passage where Zimmermann seems to agree to an influence of Galen's *Institutio logica* in al-Farabi's logic is the following:

> In using the examples 'It is not day' and 'It is night' to make this point at 68.7-9, al-Farabi seems to reject Galen's criticism of Stoic formalism.[49]

Further in his text, Zimmermann adds:

> Once alerted to the probabilities implied by al-Farabi's knowledge of Galen's logic we are able to recognize controversies and correspondences not averred by explicit reference. In the passage at 68.1ff, where al-Farabi, because he criticizes 'the commentators', can be seen to express a view distinctly his own, the examples of 'It is not day' and 'It is night' serve to illustrate the point that different forms of words make different propositions even if they entail one another. In spirit if not in substance this illustration seems to be directed against Galen who, as we know from his *Institutio logica*, was given to castigating Stoic formalism.[50]

In both passages, Zimmermann seems to affirm that al-Farabi probably knew about the contents of the *Institutio logica* (if not the *Institutio logica* itself). The passage of al-Farabi's Commentary on *De interpretatione* referred to is the following:

> The negation of one of two contraries without anything in between does not in its own words signify the other contrary; it only entails

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syllogisms, as Theophrastus and Eudemus had done after Aristotle's time. They claimed that Aristotle had composed works on hypothetical syllogisms. But looking at his books on logic, we do not find that he wrote a separate work on hypothetical syllogisms. This information is only found in the commentaries of the commentators, who relate them on the authority of Theophrastus", al-Farabi, *Al-Farabi's Commentary and Short Treatise on Aristotle's De Interpretatione*, 45 (53).

[49] Zimmermann, "Introduction", xl.

[50] Zimmermann, "Introduction", lxxxii.

affirming the other contrary. But the affirmation of the other contrary is another statement, different from the negation of the first contrary. The affirmation only follows from the negation, and what follows from a negation does not signify it in the same words as the negation. For in saying 'It is not day', we only negate the presence of day. This expression does not signify the presence of night, even though the presence of night follows from the negation of day.[51]

To understand correctly what Zimmermann calls "Galen's critique of Stoic formalism," we must take into account what Galen says about this point explicitly in the *Institutio logica*. We could say that this critique is developed mainly in two passages. We will start with the one that works as general framework:

> But here again Chrysippus and his followers, attending more to expression than to things [*te lexei mallon e tois pragmasi prosekhontes ton noun*], call all propositions [*axiomata*] constructed by so-called conjunctive connectors [*symplektikon*] 'conjunctive' [*sympeplegmena*], even if they arise from conflict [*makhê*] or consequence [*akolouthia*]. They carelessly use names in matters in which some accuracy is pertinent to the explanation and, in matters in which the words make no difference, they indicate by decreeing specific meanings. They should not use names in this way if they would speak Greek [*hellenizein*] and be clear to those who hear them.[52]

There are several elements of this quotation that should be emphasized. One is that we can see here an example of what Galen means by the Stoics "attending more to expression than to things." This example arises from Galen's earlier exposition of the relations of conflict (*makhê*) and of consequence (*akolouthia*). As we noted before, the relation of conflict and of consequence are relations between things. In other words, Galen calls "conflict" (*makhê*) the relation that those things or facts have that are not compatible (such as "it is day" and "it is night"), and "consequence"

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[51] al-Farabi, *Al-Farabi's Commentary and Short Treatise on Aristotle's De Interpretatione*, 62 (68).
[52] Galen, *Galeni Institutio Logica*, 11 (IV.6); Galen, *Galen's Institutio Logica*, 36.

(*akolouthia*) the relation of those things that go together (such as "it is not day" and "it is night").

In this sense, in defining conjunction, Galen states that "if in other sentences things are said which neither follow one another nor deny each other in conflict," that is, which have no relation of conflict or consequence, "we will call this type of proposition 'conjunctive' such as 'Dion walks and Theon converses'". [53] Basically, Galen is calling "conjunctive proposition" a proposition that refers to two things that are currently happening together without any necessary relation between them. This does not exclude, therefore, that one could occupy a similar proposition to represent a relation of consequence or conflict, such as "it is day and it is not night", or "Theon is in Athens and he is not in Isthmus". But what interests Galen is precisely this relation between things. That is why he introduces this criticism just quoted here: the Stoics call "conjunctive" any proposition that has a specific word (the conjunctive connector, *symplektikon*), "and" (*kai*), independently of the actual relation between things. In other words, for the Stoics, "conjunction" is something that characterizes a certain proposition and a certain linguistic formulation, not a certain relation between things.

In this sense, going back to al-Farabi's passage, we could say that this passage takes up what Galen said going a little further. The case is not exactly the same, since al-Farabi is talking about the non-equivalence between the propositions "It is not day" and "It is night", and about the truth of the statement "If it is not day, it is night", thanks to which we can conclude "It is night" if "It is not day". But Galen does not seem to be so interested in these fragments about the nature of negation, but rather about the equivalence (in his eyes) between disjunction and conditional to represent an excluding relation between "things", that is, the relation of conflict. The passage quoted by Zimmermann and that talks by passing of negation is the following:

> The divisive proposition [*diairetikê protasis*] is equivalent to this kind of statement 'If it is not day, it is night'. Those who attend to words [*fonais*] only call it 'conditional' [*synemmenon*], being it said in a conditional form of expression [*en skhêmati lexeôs*], whereas

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[53] Galen, *Galeni Institutio Logica*, 13 (V.4); Galen, *Galen's Institutio Logica*, 36.

> those who attend to the nature (*tê fysei*) of things [call it] disjunctive [*diezeugmenon*].[54]

At this point, it seems to us that two things should be noted. The first is that in this relevant fragment, the two propositions that are equally divisive for Galen are "Either it is day, or it is night" and "If it is not day, it is night" or "If it is not night, it is day." In this sense, Zimmermann's reading is relevant, since al-Farabi seems to be asserting with respect to this point that conditional and disjunctive propositions according to the expression, in these cases, are relating expressions, and therefore different things. The disjunction relates the being of night and the being of day, but the conditional relates the not being of night to the being of day or the not being of day to the being of night, and precisely for this reason it is a different relation. The relation of this passage of al-Farabi with what Galen said can be clarified in this way, and it is true then that al-Farabi is contrary to Galen's opinion.

The second thing we may note, by way of addition, is that it seems to us that there is another passage in the *Institutio logica* in which Galen treats in passing the problem of negation. In speaking of contradictories, Galen states the following:

> In the case of conditional propositions, one of the two contradictory ones exceeds the other in a negation; in the case of categorical ones, when the 'all' is included we will add the negation of this; in the case of 'Socrates walks', we will add the negation of the predicate, so that a statement like this remains: 'Socrates does not walk'; but we will not need to add the negation of the negative universal, the affirmative particular being contradictory with it, just as the negative universal is also contradictory with it. For this reason, we will not add the negation of this.[55]

In this fragment, Galen is describing the pairs of contradictories according to the types of proposition. In the case of conditional propositions, Galen seems to be thinking that the contradictory of "If P then Q" is "It is not the case that if P then Q" (taking perhaps a bit literally the verb 'exceed', *pleonektei*). Then, as far as categorical propositions are concerned we have

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[54] Galen, *Galeni Institutio Logica*, 9 (III.5); Galen, *Galen's Institutio Logica*, 36.
[55] Galen, *Galeni Institutio Logica*, 13-14 (VI.2); Galen, *Galen's Institutio Logica*, 37.

the pairs of contradictories "All S is P"-"Not all S is P", "Socrates walks"-"Socrates does not walk", and "No S is P"-"Some S is P". The last pair of contradictories is interesting, since Galen himself claims that "we do not need" (*ou desometha*) the negations "Not any S is P" or "Not some S is P". Moreover, as regards the pair "All S is P"-"Not all S is P", he does not mention the proposition equivalent to the latter "Some S is not P". In this sense, although "Not some S is P" is equivalent to "No S is P" (unlike the propositions "It is not daytime" and "It is nighttime"), it is relevant that for Galen negation does not play any important role in the linguistic form of categorical propositions. Insofar as negated propositions mean the same as those possessing another type of particle (such as 'no' or 'some'), one or the other use is indifferent.

For this reason, it would seem that we can affirm without so much difficulty that, as far as negation is concerned, al-Farabi "sticks more to words than to things" insofar as he seems to emphasize the importance of the absence or presence of the expression "not" (*laysa*) in determining the identity of a proposition. This importance given to the expression seems to be in several ways contrary to the position of Galen, who as we saw seems to attribute to the expression, and therefore to the linguistic elements, a rather secondary role with respect to the meaning or things. However, the way in which al-Farabi disagrees with Galen, is so different in context and language, that it is difficult to see a concrete textual relation. As in the previous section, we can just suppose that there is an Aristotelian source of which both authors draw.

4.   Parallelism in the proof of Bocardo

In his study dedicated to al-Farabi's syllogistic, Lameer says the following regarding the proof of Bocardo in al-Farabi:

> It will be clear that al-Farabi's exposition of the proof BOCARDO is different from [Aristotle's]. For where the Aristotelian proof proceeds through *ekthesis* as conceived of by Wieland, followed by DATISI and, taking the alternative conclusion to the argument, FERISON, al-Farabi's proof is as follows: *ekthesis* according to Patzig's initial interpretation of it, BARBARA, and FELAPTON. A

similar interpretation of the proof of BOCARDO through *ekthesis* is found in Galen's *Institutio Logica* X.8 24.1-9.[56]

In this case, then, the parallelism between the contents of the *Institutio logica* and al-Farabi's work is to be found in the way Bocardo is proved. This would be something pertaining to al-Farabi's books concerning the *Prior analytics*, that is the *Kitāb al-qiyās* and the *Kitāb al-qiyās aṣ-ṣaghīr*. In the first one we can find the following:

> The sixth [mood] is 'Some B is not an A; and every B is a C'. It produces the conclusion 'Some C is not an A', because if A is denied of the whole of the 'some B', and we take that some [B] to be D, [the premise-pair] becomes: 'No D is an A; and every D is a C', which reduces to the second mood of this [same] figure. It has been shown that this mood reduces to the fourth mood of the first figure.[57]

In the *Kitāb al-qiyās aṣ-ṣaghīr* we can find practically the same proof:

> If it be given us that 'Some C is not M' we arrive at 'Some of C's are not M's'. It is evident that the entirety of this part [of C] is not M, and that no single thing belonging to this part [of C] is M. Therefore if we take this part [of C] -let it be the mountains [=the part P]- then [the situation] is as follows: No single P is M. But we already have 'Every C is R', and P is [a part of] C; so that we arrive at: Every P is R, and no single P is M. Therefore we have reduced [this syllogism] to the tenth syllogism. Therefore it is necessary by this [pair of premisses] that 'Some R is not M'. But this is what was given us as the conclusion of the fourteenth [syllogism].[58]

Using the usual notation for categorical syllogisms (stating first the predicate and then the subject with upper letters, and the quality and quantity of the proposition with lower letter a, e, i, o), we can say that AoB

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[56] Lameer, *Al-Farabi And Aristotelian Syllogistics*, 122-123.

[57] Abu Nasr al-Farabi, *Al-mantiq 'inda l-Fārābī*, ed. Rafiq al-'Ajam (Beirut: Dar al-Mashreq, 1986), 3/29-30; Abu Nasr al-Farabi, *Syllogism: An Abridgement of Aristotle's Prior Analytics*, trans. Saloua Chatti & Wilfrid Hodges (London: Bloomsbury, 2020), 132. We give here Chatti and Hodges' translation.

[58] Al-Farabi, *Al-mantiq 'inda l-Farabi*, 3/81-82; Abu Nasr al-Farabi. *Al-Farabi's Short Commentary on Aristotle's Prior Analytics*, trans. Nicholas Rescher (Pittsburgh: University of Pittsburgh Press, 1963), 73. We give here Rescher's translation.

and CaB, entails CoA. In both excerpts, this is done by exposing a fourth term D, which indicates those B's of which A is not predicated. Then, we have AeD, and CaD, of which we can conclude CoA (by conversion of the a-premise and Ferio).

If we take a look at the exposition of the sixth mood of the third figure (*Institutio logica*) in the *Institutio logica*, we find the following:

> And by *ekthesis*, this is demonstrated thus: since the first is not predicated of some of the third, take [those of the third] of which [the first] is not predicated and let it be the fourth; then, the first will not be said of any fourth; but since the fourth is some of the third, the third will be predicated of all of it [i.e. the fourth]; but the second is also predicated of all of the third, then also of all of the fourth; but the first is predicated of none of the fourth; then, the first will not be said of some of the second.[59]

As Lameer indicates, this passage of Galen's *Institutio logica* precisely describes the procedure that al-Farabi used in both of his works on syllogisms to prove Bocardo. However, there's nothing that indicates that al-Farabi could have been informed of this method of proving Bocardo through the reading of the *Institutio logica* (or a work with similar wording of the same procedure). There is no similar wording, no similar examples that we could draw on so as to assume that there was an influence from Galen to al-Farabi. Things being said, and since it is to our knowledge the only proof of a mood where there is a similarity between al-Farabi's work and Galen's *Institutio logica*, it is rather expected that al-Farabi was informed of this proof through a third work. One should add that Lameer himself didn't brought forward the idea of an influence, but rather of a "parallelism": "As to his proof of BOCARDO, this was found to have a parallel in Galen's proof of this mood as stated in the *Institutio Logica*".[60]

5. Conclusion

Having discussed three main places of al-Farabi's logic which bear a certain resemblance with some passages of Galen's *Institutio logica*, it seems that, for the time being, evidence is contrary to a textual evidence.

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[59] Galen, *Galeni Institutio Logica*, 24 (X.8); Galen, *Galen's Institutio Logica*, 42.
[60] Lameer, *Al-Farabi And Aristotelian Syllogistics*, 131.

The resemblance of the doctrines of consequence and incompatibility in al-Farabi, and the one of consequence and conflict in Galen is striking at first but shows too many discrepancies as to see a direct influence. On the other hand, it seems true that al-Farabi's attitude toward what we may call "logic informalism" is a negative one, it is however something that does not seem to have a direct relation with Galen's text (and, in a certain way, it is a general Aristotelian position). Finally, the similarity in the proofs of Bocardo in al-Farabi's books on syllogism and the one in the *Institutio logica* is indeed interesting, but being the only similar proof it is difficult to defend the case for a textual influence.

What seems unsatisfying though is that what Galen and al-Farabi share from the Aristotelian tradition seems to come from a common source, and this common source is yet to be exposed.

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References

Al-Farabi, Abu Nasr. "Al-Farabi's Paraphrase of the 'Categories' of Aristotle". trans. Douglas Dunlop. Islamic Quarterly 5/1 (1959), 21-54.

Al-Farabi, Abu Nasr. Al-Farabi's Short Commentary on Aristotle's Prior Analytics. trans. Nicholas Rescher. Pittsburgh: University of Pittsburgh Press, 1963.

Al-Farabi, Abu Nasr. Kitāb fī al-mantiq. Al-khaṭāba. ed. Muhammad Salim Salim. Cairo: Maṭba'a dār al-kutub.

Al-Farabi, Abu Nasr. Al-Farabi's Commentary and Short Treatise on Aristotle's De Interpretatione. trans. Fritz Zimmermann. Oxford: Oxford University Press, 1981.

Al-Farabi, Abu Nasr. Al-mantiq 'inda al-Fārābī. ed. Rafiq al-'Ajam. 4 Volumes. Beirut: Dar al-Mashreq, 1986.

Al-Farabi, Abu Nasr. Syllogism: An Abridgement of Aristotle's Prior Analytics. trans. Saloua Chatti & Wilfrid Hodges. London: Bloomsbury, 2020.

Aristotle. Aristotelis Categoriae et Liber De Interpretatione. ed. Lorenzo Minio-Paluello. Oxford: Oxford University Press, 1949.

Bobzien, Susanne. "Pre-Stoic Hypothetical Syllogistic in Galen's Institutio logica". Bulletin of the Institute of Classical Studies. Supplement 77 (2002). 57-72.

Bobzien, Susanne. "Peripatetic Hypothetical Syllogistic in Galen". Rhizai. A Journal for Ancient Philosophy and Science 2 (2004). 57-102.

Galen. Galeni Institutio Logica. ed. Karl Kalbfleisch. Leipzig: B. G. Teubner, 1896.

Galen. Galen's Institutio Logica: English Translation, Introduction, and Commentary. ed. & trans. John Kieffer. Baltimore: Johns Hopkins University Press, 1964.

Hodges, Wilfrid. "Introduction". Syllogism: An Abridgement of Aristotle's Prior Analytics. auth. Abu Nasr al-Farabi. trans. Saloua Chatti & Wilfrid Hodges. London: Bloomsbury, 2020.

Ibn al-Nadim, Muhammad. The Fihrist of al-Nadim; a tenth-century survey of Muslim culture. ed. & trans. Bayard Dodge. 2 Volumes. New York: Columbia University Press, 1970.

Ibn Ishaq, Hunayn. Hunain Ibn Ishaq. Über die Syrischen und Arabischen Galen- Übersetzungen. ed. Gotthelf Bergsträsser. Leipzig: Deutschen Morgenländischen Gesellschaft, 1925.

Karimullah, Kamran. "Alfarabi on conditionals". Arabic Sciences and Philosophy 24 (2014). 211-267. https://doi.org/10.1017/S0957423914000022

Lameer, Joep. Al-Farabi And Aristotelian Syllogistics: Greek Theory and Islamic Practice. New York: E.J. Brill, 1994.

Morrison, Ben. "Logic". The Cambridge Companion to Galen. ed. Robert Hankinson. 66-115. Cambridge: Cambridge University Press, 2008.

Zimmermann, Fritz. "Introduction: Al-Farabi's Theory of Propositions in its Doctrinal Setting". Al-Farabi's Commentary and Short Treatise on Aristotle's De interpretatione. auth. Abu Nasr al-Farabi. ed. & trans. Fritz Zimmermann. i-cl. Oxford: Oxford University Press, 1981.