İSTANBUL UNIVERSITY PRESS

Felsefe Arkivi - Archives of Philosophy
ARCP 2024, 61 : 84–90
DOI: 10.26650/arcp.1570889

Research Article / Araştırma Makalesi

Singular Predication and the Syllogism

Tekil Yükleme ve Kıyas

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Submitted/Başvuru : 20.10.2024
Accepted/Kabul : 26.12.2024
Pulished Online / Online Yayın : 31.12.2024

ABSTRACT

Aristotle's categorical syllogistic is the first formal deductive system in the history of formal sciences. Most parts or elements of the system are validated by modern (first-order) mathematical logic, but the system is quite limited in scope, as it is incapable of analyzing inferences other than the 'figure syllogisms' consisting of a couple of *a-e-i-o* premises and an *a-e-i-o* conclusion, containing three 'moderately' universal terms – terms that express neither a highest genus nor a lowest species – each of which is common to a different couple of propositions out of the three. Logicians in the following ages dealt with various questions concerning the addition of various (novel) logical forms into this limited system, among which are singular predications, i.e. categorical propositions with a singular term as subject, and the most common choice has been interpreting singular predications as *universal* predications. This paper tries to take a strictly formal perspective on the system of categorical syllogisms, and argues in detail for a much simpler and fairly effective assimilation or translation scheme for singular predications. The key to the proposed scheme is the preservation of the supposed inferential relation between opposite singular predications, namely *contradiction*. It is argued that the resulting *singularized* syllogistic moods, which are also validated by first-order logic (under its standard renderings of *a-e-i-o* and singular predications), promote in turn the mentioned type of treatment, since they call for the employment of two of the four subaltern moods of the system, disregarded by Aristotle, which are *formally* there.

Keywords: Singular predication, syllogism, contradiction, subalternation, formalism

ÖZ

Aristoteles'in kategorik kıyas kuramı (veya kıyâsiyâtı), biçimsel bilimler tarihindeki ilk biçimsel türetim sistemidir. Sistemin birçok kısmı veya öğesi modern (birinci seviye) matematiksel mantık tarafından da geçerlilenir, ama sistemin kapsamı çok dardır, çünkü bir çift a-e-i-o öncülüyle yine a-e-i-o tipinde bir sonuç önermesinden oluşan ve bünyesinde, her biri, farklı bir çift önermeye ortak olan üç tane 'orta dereceden' tümel terim – yani, ne bir en yüksek cinsi ne de bir en aşağı türü ifade eden üç terim – barındıran 'şekil kıyasları' dışındaki çıkarımları çözümlemeye kabiliyetli değildir. İzleyen çağların mantıkçıları bu sınırlı sisteme çeşitli yeni mantıksal biçimlerin eklenmesiyle ilgili çeşitli sorunları tartışmışlardır ki bunlardan bir tanesi de tekil yüklemeler, yani öznesi tekil terim olan kategorik önermeler sorunudur. En yaygın kabul gören tercih de tekil yüklemeleri tümel yüklemeler olarak yorumlamak olmuştur. Bu çalışma, kategorik kıyaslar sistemine katı bir tarzda biçimci (formalist) bir açıdan bakmaya çalışmakta ve tekil yüklemeler için çok daha yalın ve oldukça verimli bir tercüme planını ayrıntılı olarak savunmaktadır. Planın anahtarı, karşıolumdaki tekil yüklemelerin arasında bulunduğu kabul edilen çıkarımsal bağıntının, yani çelişkinin muhafazasıdır. Tercümenin sonucu olarak elde edilen ve birinci seviye mantık tarafından da (a-e-i-o yüklemelerinin ve tekil yüklemelerin standart karşılıklarını kabul edersek) geçerli kılınan tekilleştirilmiş kıyas kipleri de tercümenin dayandığı tavrın kendisini teşvik etmektedir, çünkü tekilleştirilmiş kıyaslar, Aristoteles'in kayıtsız kaldığı ama biçimsel olarak orada duran dört altıklamalı kipten ikisinin kullanılmasını gerektirmektedir.

Anahtar Kelimeler: Tekil Yükleme, Kıyas, Çelişki, Altıklama, Biçimcilik

Introduction

Aristotelian syllogistic is primarily an instrument for Aristotelian science.[1] That's the most probable reason why this theory is designed as the formal theory of inferences covering only (assertoric or modal) categorical propositions of the *a-e-i-o* type. Although mentioned/classified – along with indefinite categorical propositions – in earlier logical texts (esp. *De Interpretatione*[2]), singular categorical forms – or more properly, syllogisms containing singular premises or a singular conclusion – are absent from the categorical syllogistic of the *Prior Analytics*.

Later authors writing on the subject proposed assimilating singular predications to *general* (i.e. quantified) types of predication, namely the *a-e-i-o* forms – for example, by interpreting the singular as *universal* predication.[3] But it is the syllogistic theory, and not the early ontology/semantics of *kategorein* in isolation, that should say the last word on whether the singular form can be accommodated, and syllogistic theory does not *seem* to favor singular categorical reasoning.[4] However, as the discussion below is meant to show, syllogistic theory *can* accommodate singular categorical reasoning (i.e. reasoning from or to singular predications) effectively, once attention is paid to its *formal* nature.

1. The Problem: Syllogisms From/To Singulars

First of all, the theory of categorical syllogisms, presented in the chs. 4-7[5] of the *Prior Analytics* incorporates a certain element of analysis that instantly problematizes singular predication: the recognition that syllogistic reasoning comes in different *figures (skhemata)*, each figure corresponding to a specific ordering of the syllogistic terms – i.e. of the *meson* (middle term) and the *horoi* (boundaries, extremes etc.) of the syllogism – in the premises. Now that there are different syllogistic figures suggests that a syllogistic term in general should be capable of holding both the subject and the predicate position in the (relevant) predication;[6] of course, there's nothing unacceptable about a universal term's being the logical subject of a categorical proposition (thanks to Aristotle's liberal reading of the 'being-said-of' relation), but no singular term can be a *logical predicate*, since it is positioned as the lowest bound of predication (or Porphyrean *specification*):

> Now of all the things there are, some are such that they cannot be predicated truly and universally of anything else (for instance, Cleon or Callias, that, what is individual and peceptible), but other things may be predicated of them (for each of these is both a man and an animal). Some things are themselves predicated of others, but nothing else is prior and predicated of them. And some things are both predicated themselves of others and others of them, as man is predicated of Callias and animal of man[7]

Although singular terms, terms that pick out a single referent or nominee, can 'accidentally' hold the predicate position in certain sentences of natural language, this does not mean that they can be the *logical* predicates of categoricals.[8] The complications of this final point should not concern us, since Aristotle's maxim-like imposition is perfectly clear: singular terms cannot hold the predicate position in categorical propositions, period.

However, even under this imposition about categorical propositions, categorical syllogistic, ironically, again thanks to the presence of different term positions and different figures, seems able to accept singular terms into certain positions. Clearly, a singular term cannot hold the major term position in any syllogism; but it can hold the minor position in the first two figures and both the minor and middle positions in the third.[9] Thus the thesis (mentioned above) that categorical syllogistic requires that every syllogistic term should be capable of holding either position in a proposition is too broad, too uncarved to be correct.

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[1] Although, we should add, the standard view of a Peripatetic logic presents *sullogismos* as at equal distance to its demonstrative, dialectical and sophistical applications. However, even the presence of analytical syllogism in Aristotle's dialectical work is far from being certain. The early dialectical theory nevertheless comes at certain points very close to the later syllogistic analysis; see William Kneale and Martha Kneale, *The Development of Logic* (Oxford: Oxford University Press, 1962), 36-37. See Ernst Kapp, *Greek Foundations of Traditional Logic* (New York: Columbia University Press, 1942), 6-7 for the chronological order of Aristotle's logical works, and 16-17 for the origination of the idea of syllogism as a formal entity out of Aristotle's semi-theoretical thinking on dialectical practice.

[2] 17b26-36; Aristotle, *Categories and De Interpretatione*, tr. Jonathan Barnes (Oxford: Oxford University Press, 1963), 48.

[3] Jonathan Barnes, *Truth etc.: Six Lectures on Ancient Logic* (Oxford: Oxford University Press, 2007), 155.

[4] George Englebretsen, "Singular Terms and the Syllogistic", *The New Scholasticism* 54, 1 (1980), 68.

[5] Aristotle, *Prior Analytics: Book I*, tr. Gisela Striker (Oxford: Oxford University Press), 4-12.

[6] Cf. Jan Lukasiewicz, *Aristotle's Syllogistic: From the Standpoint of Modern Formal Logic* (Oxford: Oxford University Press, 1957 [1951]), 6-7.

[7] *An. Pr.* 43a25-32; Aristotle, *Prior Analytics*, 43. Note that it is almost clear that the word 'universally' here does not express its usual sense according to which it is the polar of 'particularly', as when it is used to specify the quantity of a predication (i.e. "B is universally/particularly said of A"). Gisela Striker in her Commentary (p. 189) on the translated text says: "The word 'universally' (καθόλου) is puzzling, since Aristotle is speaking of individual objects that cannot be predicated at all, whether universally or not". Striker evaluates the earlier interpretations of this sentence, and none seems tenable (enough) to her. However, Smith's interpretation of the locution as 'genuinely as a universal' – i.e. as something *predicable* – seems to neutralize the vagueness in Aristotle's idiom.

[8] Aristotle's examples (*An. Pr.* 43a30-35; Aristotle, *Prior Analytics*, 43): "...for we do sometimes say that the white thing there is Socrates, or that what is approaching is Callias". Interestingly, the same is true of the upper bound of logical predication, namely of highest genera, which is also admitted by Aristotle.

[9] Günther Patzig, *Aristotle's Theory of the Syllogism: A Logico-Philological Study of Book* A *of the* Prior Analytics, tr. Jonathan Barnes (Dordrecht: D. Reidel Publishing, 1968), 8. Let us remind ourselves that there is no fourth figure in Aristotle's syllogistic; see Lynn E. Rose, "Aristotle's Syllogistic and the Fourth Figure", Mind 74, 295 (1965), 382-89.

Of course, there are further restrictions on the acceptance of the singular, imposed by the nature of either the syllogism or the categorical proposition itself, which forces us to specify the available forms of inference with more detail, on the lower level of the *moods*. We will turn to these restrictions and try to understand the philosophical import of what they yield for the singular term and singular proposition. But before that, we should first block a possible misunderstanding of what we are trying to do, by clarifying our perspective on the question of the accommodation of singularity by the syllogistic theory.

Syllogistic theory of the *Prior Analytics* is first and foremost a *deductive, formal* theory of reasoning, irrespective of its limitations on the types of reasoning it can analyze. It may be too restricted in its actual (or intended) scope, namely to Aristotelian dialectics of the *Topics* and, more importantly, Aristotelian essentialist science which employs only (non-modal or modal) categorical propositions, and is definitely incapable of analyzing even the simplest forms of reasoning with composite propositions, like instances of the Stoic indemonstrables.[10] Nevertheless, syllogistic is *formal science* in its general outline, since it abstracts from the content of propositions by substituting variable-like letters for the content-providing terms, the *categoremata*, in order to arrive at the basic forms of *being-said-of* and thereby at the moods and figures; and it is deductive science, since it offers formal *proofs* for the intuitively validated moods on the basis of a couple or quadruple of syllogistic forms – the 'perfect' moods – and several rules of 'immediate' inference for the *a-e-i-o* types, or indirect proofs, again employing certain immediate inference rules and the method of *reductio ad absurdum*.

So the problem of assimilating singulars to syllogistic does not have to take the shape of a philosophical investigation of, say, the *notional* connections between singularity and the general quantities, universality and particularity, or of whether singular terms express an eccentric type of concept, the so-called *individual* concept[11] – a concept that applies only to a single individual substance, and contains in it whatever is predicable truly of that individual substance – or of whether the primary ontic units of reality are individuals or universals, or whether general predications are modeled after singular predication and so on. The only thing that matters is the pre-logical intuitions or presuppositions about singular predication, and the formal-deductive impositions by the syllogistic theory. Fortunately, when specified clearly, these two types of limitation are enough to integrate syllogistic reasoning with singular propositions into syllogistic as it is, i.e. as a theory of reasoning exclusively with *a-e-i-o forms*.

2. The Singular in Syllogistics: Restrictions

Now, although it may have become customary to speak of *the* singular form of proposition (as in the other quantities), there is actually no *single* form of singular predication, but a couple of forms, the singular *affirmative* and the singular *negative*: every predication is either an affirmation or negation, and, more importantly, for every affirmation (negation) there exists an opposite negation (affirmation) – i.e. a negation (affirmation) with the same logical subject and logical predicate – as Aristotle says in the *De Interpretatione*. So to be able to judge sensically of an individual that, say, it is a living being, requires also to be able to judge sensically of it that it is *not* a living being.

Of course the same holds of quantified subjects, or more in line with the Aristotelian idiom, universal[12] subjects taken universally or particularly, as in "All bodies are extended" and "Some bodies are living beings" – the opposites being "No body is extended" and "Some bodies are not living beings", respectively. Aristotle specifies two logical relations, *contradiction* and *contrariety*, by means of the resulting four forms of predication, namely, *a-i-e-o* categoricals. Contradiction is the relation between an affirmation about a universal taken universally and the opposite negation about the same universal taken particularly, or the other way round, an affirmation about a universal taken particularly and the corresponding negation about the same universal taken universally. Contrariety is then the relation between an affirmation and the corresponding negation about the same universal subject taken universally.

Aristotle of the *De Interpretatione* is perfectly clear on the logical relation that holds – or should hold – between a singular affirmative predication and its opposite negation: *contradiction*.[13] So any proposition of the form 'S is P', where 'S' is a singular term, is contradictorily opposed to that of the form 'S is not P', which means that at least and at most one of them can be true in each possible 'interpretation' (i.e. assignment of contentful terms to the logical positions). Another pre-analytical limitation is that there is some sort of semantic asymmetry in the singular proposition, specifically in the singular affirmative, which we do not necessarily find in general categorical propositions, since while the logical predicate of the singular (affirmative) proposition is undoubtedly a universal (or signifies one), its logical

[10] See especially Kneale and Kneale, *The Development of Logic*, 44, for the connection of Aristotle's conception of a demonstrative science of essences, genera and species etc. with his formal science of syllogistic reasoning.

[11] i.e. G. W. Leibniz's *notion individuelle*. See DM §§8-9 in Leibniz, *Discours de Métaphysique suivi de Monadologie et autres textes*, ed. Michel Fichant (Paris: Gallimard), 159-62.

[12] See footnote 7 above.

[13] Aristotle, *Categories and De Interpretatione*, 48.

subject is definitely an individual substance, a 'this', which cannot ever be the logical predicate of any proposition. (In somewhat obscurer terms, the individual, unlike the universal, cannot be *been* by anything, if 'to be been' is understood as 'to be instantiated'.) These are two *proprieties* of the singular form of predication which we would also find to agree with our intuitions.

What do these tell us about the translation of the singular forms into the *a-e-i-o* forms? As is well known, Aristotle presents four instead of two logical (or predicative) quantities in the *De Interpretatione*, one of which, the indefinite, he himself later assimilated to the particular;[14] but the other 'irregular' quantity, *singularity*, just disappears in the logic of the *Analytics*.[15] Philosophers of much later periods, such as Petrus Ramus and G. W. Leibniz, thought it natural to interpret singular forms as universals, mainly because of the *notional* similarity between an individual as a whole and a secondary substance 'as a whole', that is, in its full extension.[16] Maybe I. Kant can be added to these names, since although he treated the singular predicative form as a distinct, third moment under the title of *Quantity* in the table of judgmental forms – and, parallel to that, Unity as a distinct, third *category of quantity* alongside Totality and Plurality – in the *Critique of Pure Reason*, he clearly endorsed (A71/B96) the traditional assimilation in the exact same manner: "The logicians rightly say that in the use of judgments in syllogisms singular judgments can be treated like universal ones. For just because they have no domain at all, their predicate is not related to some of what is contained under the concept of the subject while being excluded from another part of it. The predicate therefore holds of that concept without exception, just as if the latter were a generally valid concept with a domain with the predicate applying to the *whole* of what is signified."[17]

Well, since the problem is to translate the singular forms into the 'language' of a formal deductive system, it should be some *deductive* aspects (if any) that we can grasp from our pre-logical conception of singularity that are to shape the correct translation. And fortunately, each of the two proprieties of Aristotelian singular predication – that there is some ontic asymmetry to singular affirmative predication, and that singular opposites are contradictories (not contraries) – takes a purely formal, deductive shape, when considered under the light of the syllogism.

First, the semantic asymmetry in the singular affirmative proposition between the logical subject, which is a singular term, and the logical predicate, which is a universal, finds a correlate in the *a-e-i-o* types by means of the simple medieval doctrine of *distribution* (of terms). The doctrine is nothing more than an allocation of distributive statuses to the logical terms of a given *a-e-i-o* categorical, according to which the subjects of universal predications and the predicates of negative predications are *distributed* – i.e. taken in their whole extension – while the subjects of particulars and predicates of affirmatives are *undistributed*, i.e. taken particularly. Assuming that we decided to translate the singular affirmative to an affirmative general categorical, the two options available differ critically in this respect: while the a-form preserves the imbalance between the statuses, the *i*-form is perfectly symmetric. Moreover, a regular *i*-predication is simply convertible, where being a converse is an instance of the inferential relation of logical equivalence; translating a singular affirmative as an *i*-form will then force the singular term holding (naturally) the subject position to *be able* to hold, without any change in distributive status, and without any change in inferential potency, the predicate position alike.[18]

In other words, because of the semantic-inferential symmetry of the regular *i*-form, if we translate the singular affirmative to the *i*-form, not only the singular subject of the affirmation loses its singular character with respect to its universal predicate, but the singular subject's holding the subject position becomes accidental, contra Aristotle's commentary on the margins of the Porphyrean tree. Therefore, it is the *a*-form that will translate a predication of the form 'S is P' (or 'P is said of S'), where 'S' is singular.

This might seem to be the same proposal as the one(s) made by the philosophers mentioned above, but it is not. For the idea here is to interpret the singular affirmative as universal affirmative predication on the grounds of a semantic resemblance, not between a singular *term* and a universally quantified universal term (or between Unity and Totality!), but between singular affirmative predication as a whole and universal affirmative predication as a whole, which finds expression in a traditional doctrine, the doctrine of term distribution. The importance of this nuance immediately comes to light with the question of how to interpret the singular *negative* form. The historical proposal, since it focuses on the relation between singular and a universally quantified term, should choose, for consistency, the e-form. However, since

[14] Jean-Pierre Belna, *Histoire de la Logique* (Paris: Ellipses, 2014), 13.

[15] Belna, *Histoire de la Logique*, 13.

[16] Kneale and Kneale, *The Development of Logic*, 323-24.

[17] Immanuel Kant, *Critique of Pure Reason*, tr. Paul Guyer and Allen W. Wood (Cambridge: Cambridge University Press, 1998), 207 [italics mine]. For the parallelism between *forms* and *categories* of quantity, see Béatrice Longuenesse, *Kant and the Capacity to Judge: Sensibility and Discursivity in the Transcendental Analytic of the* Critique of Pure Reason, tr. Charles T. Wolfe (Princeton: Princeton University Press, 1998), 247-49.

[18] Actually, medieval logicians defined certain principles of conversion for singular predications, but this has nothing to do with our discussion: they just did not interpret singular predications as *a-e-i-o* predications, but thought them to have their own inferential order. See Terence Parsons, *Articulating Medieval Logic* (Oxford: Oxford University Press, 2014), 67.

our proposal considers the semantic and inferential significance of the predicative forms themselves instead of their singular or quantified terms in isolation, it will definitely choose the o-form, since the supposed inferential relation between singular opposites is not contrariety but contradiction.

The *o*-form is also distributively asymmetric, but in a different order: it is the predicate and not the subject that is distributed in this case. Now, the predicate of the *o*-form obtains its distributive status irrespective of the quantity either of the subject or the proposition as a whole (which are always the same). So what is going on with the subject? *Why should the subject of a singular negative predication be thought to be quantified particularly?* Well, it is not, for the same reason above. The subject of a singular affirmative or negative has no exact correlate in the form of a syllogistic term, so it is not the singular term that is particularly quantified in a singular negative, but the *dummy* syllogistic term of the regular *o*-proposition ('D') which it is *interpreted as*:

S is P » Every D is P.
S is not P » Some D is not P.

Thus the presence of an asymmetry, in whichever order, in the *o*-form as *a whole* is sufficient for preserving the original asymmetry in singular predication.

3. Singularized Syllogistic Moods

We have noted above that a singular subject in principle can hold the minor term position in the first two figures, and the middle or the minor term position in the third. This restriction immediately filters out Darii in the first figure, Camestres in the second, and Datisi and Disamis in the third. But even under this restriction, not every remaining Aristotelian mood can be singularized *sensically*, or productively, if you will. Ferio, for instance, although it has an o-conclusion, has no *a*-premise with the same dummy syllogistic subject as that conclusion:

No M is P; some D is M; therefore some D is not M.

Syllogistically, the minor and the conclusion predicate the universal M, in different qualities, of the dummy D, but only the conclusion as a whole can be taken as the correlate of a singular negation, so the minor cannot be about the same individual substance as the one the singularized conclusion is about. The reason is obvious: once singularized, the conclusion is not about the dummy universal D, but about a singular S, of which the universal M is negated. From the perspective of analyzing singular reasoning, a singularized Ferio is utterly useless.

Same holds for Celarent in the first figure, Cesare and Festino in the second, and Felapton in the third. The remaining four Aristotelian moods, Barbara, Baroco, Bocardo, and Darapti, are perfectly singularized; and each of these forms is obviously validated by our intuitions about reasoning to/from singulars, and also by first-order logic under the standard translation of traditional predicative forms:

Barbara^{sg}: All M is P; but S is M; therefore S is P.
(x)(Mx $\rightarrow$ Px); Ms; therefore Ps.

Baroco^{sg}: All P is M; but S is not M; therefore S is not P.
(x)(Px $\rightarrow$ Mx); but ¬Ms; therefore ¬Ps.

Bocardo^{sg}: S is not P; but S is M; therefore some M is not P.
¬Ps; but Ms; therefore $\exists$x(Mx & ¬Px).

Daraptisg: S is P; but S is M; therefore some M is P.
Ps; Ms; therefore $\exists$x(Mx & Px).

The productivity problem with Celarent and Cesare mentioned above can be solved if they are replaced by their subalterns, Celaront and Cesaro, which are likewise validated on both grounds:

Celaront^{sg}: No M is P; but S is M; therefore, S is not P.
(x)(Mx → ¬Px); but Ms; therefore, ¬Ps.

Cesaro^{sg}: No P is M; but S is M; therefore, S is not P.
(x)(Px → ¬Mx); Ms; therefore, ¬Ps.

4. An Alternative Perspective on Aristotelian Science

Now these six singularized moods, two of which are actually non-Aristotelian, form two groups of inter-convertibility according to the logic of *conversio syllogismi* (conversion of the syllogism, *CS*) which Aristotle applies to his standard list of 14 moods in *An. Pr.* B.[19] The logic of CS is actually propositional and simple: if A, B |- - C then A, ¬C |- - ¬B. Using this, Aristotle transforms each mood in one of the three figures to two moods, each being in a distinct figure. For instance, regular Barbara transforms into a Baroco by negating the minor and into a Bocardo by negating the major. Aristotle considered this an alternative method of reducing the imperfect to perfect moods, but of course it enables various choices of *initial* moods, even those that pick out moods from different figures. But the fact is that Aristotle's particular application of CS lacks symmetry, in that Darapti and Felapton transforms into the four subaltern moods of the system, Barbari, Celaront, Cesaro, Camestrop, which Aristotle disregards[20] in his syllogistic corpus. Aristotle's strategy is to use an incorrect (invalid) version of the principle of CS, by which means Darapti and Felapton converts to principal, Aristotelian moods. Assuming 'X' means 'the contrary of X' (which of course does not express any logical *operation* in the strict sense, for contrariety, unlike contradiction, is not instantiated by any couple of unary truth-functions[21]), the incorrect version runs: If A, B |- - C then A, ¬C |- - B.[22]

Aristotle's motivation in disregarding or blocking subalternation in his syllogistic system at the expense of falling into logical error may be explained in terms of the redundant character of subaltern moods in the context of dialectical engagement *and* demonstrative science. (After all, why arrive at the weaker categorical when the strong one is available?) But whatever his real motivation is, this attitude towards the subaltern moods, which are irresistible consequences of his system under CS, is one that is not shared by those who have really focused on the deductive formal character of categorical syllogistic, primarily by G. W. Leibniz.

Leibniz, in complete agreement with his mastery of formal science, not only extended – or better, completed – Aristotelian categorical syllogistic to its formal limits by specifying 24 moods evenly distributed to 4 figures,[23] including of course the subalterns, but he also employed syllogisms, which are mediate inference schemata, to validate *immediate* inferences, specifically the conversion inferences. The latter he managed by means of slipping into immediate inferences a logically true formula of the *a-e-i-o* type such as 'Some P is P' or 'Every S is S' as an additional premise, hence expand them to mediate inferences albeit with a doubly functioning term, nevertheless fitting flawlessly into syllogistic figures. For instance, the conversion inference from the particular affirmative 'Some S is P' to 'Some P is S', is expanded to a 3rd-figure syllogism (Datisi) by the addition of the logically true 'Every S is S':

i-conversion: Some S is P; therefore, some P is S.
Datisi^{exp}: *Every S is S*; but some S is P; therefore, some P is S.

where the syllogistic term 'S' functions both as the major and the middle term.

The relevant point here is his particular treatment of the syllogistic theory, which is a solid historical paradigm for our justification of the proposed translation of the singular forms under the same kind of treatment: he employs the theory purely as a formal apparatus for proof, even for immediate inferences.[24] This is the perspective we have argued for

[19] Günther Patzig, *Aristotle's Theory of the Syllogism: A Logico-Philological Study of Book A of the* Prior Analytics, tr. Jonathan Barnes (DordRecht: D. Reidel Publishing, 1968), 152-54.
[20] Jozef M. Bochénski, *Ancient Formal Logic* (Amsterdam: North-Holland Publishing, 1951), 49.
[21] Same for sub-/super-alternation and subcontrariety. Note that the truth-functional binary connective '|' can only be a *material* projection of the binary relation of contrariety, and it actually corresponds to a ternary relation, between the two arguments and their truth-function.
[22] Aristotle's difficulty in grasping the correct logic of contrariety is first instantiated in the *Topics*. See Bochénski, *Ancient Formal Logic*, 36.
[23] See, for instance, his paper "Of the Mathematical Determination of Syllogistic Forms", in G. W. Leibniz, *Logical Papers*, tr. G. H. R. Parkinson (Oxford: Oxford University Press, 1966), 105-11.
[24] However, Leibniz's position on the interpretation of the singular predicative forms, although still formalist in essence, is centered around the equivalence (which he supposes to hold) between any singular term 'S' with the quantified terms 'some S' and 'Every S', instead of the inferential relation between a singular predication and its opposite. See his paper "Some Logical Difficulties" (which begins with the question of singular predication) in Leibniz, *Logical Papers*, 115-21.

above in order to show the deductive capability of categorical syllogistic beyond inferences consisting of affirmations and negations of mediate universal terms of mediate universal terms.

Conclusion

Aristotelian categorical syllogistic can accommodate singular 'syllogistic' reasoning, if the accommodation is provided by a translation scheme that pays regard to pre-syllogistic conditions about the semantic (distributive) statuses of, and inferential relations between, the singular opposites. So the classical assimilation of singular predications to universal predications fails for inferential, while the other available option of translation, the *i-e*, fails for semantic reasons. The only tenable translation, the *a-o*, better represents the effectivity of categorical syllogistic as a formal deductive system – it not only confirms that syllogistic can handle certain 'irregular' types of reasoning, but it also draws attention to the convenience of non-Aristotelian but perfectly regular forms, the subaltern moods, in this endeavor.

Peer Review: Externally peer-reviewed.
Conflict of Interest: The author has no conflict of interest to declare.
Grant Support: The author declared that this study has received no financial support.

Hakem Değerlendirmesi: Dış bağımsız.
Çıkar Çatışması: Yazar çıkar çatışması bildirmemiştir.
Finansal Destek: Yazar bu çalışma için finansal destek almadığını beyan etmiştir.

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How cite this article / Atıf Biçimi

Besler, Arman. "Singular Predication and the Syllogism" *Felsefe Arkivi- Archives of Philosophy, 61* (2024): 84–90. https://doi.org/10.26650/arcp.1570889