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Exploring Aristotle's Modal Syllogism

Aristoteles'in Modal Kıyasını Keşfetmek

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Abstract: Aristotle's viewpoints on modal propositions have been subjects of debate and exploration among scholars since his immediate successors. This study delves into how Aristotle defines assertoric and modal propositions and elucidates the correlations between these propositions and assertoric ones. Traditionally, commentators have interpreted propositions based on the premise that what belongs to the subject also belongs to the predicate. However, in this research, propositions are interpreted as ones in which what is predicated on the predicate will also be predicated on the subject. The outcome of this investigation demonstrates the modal premise process through the Barbara and Celarent syllogism forms in the first figure, which can be reduced to encompass all other forms.

Keywords: Aristotle, modality, necessity, contingency, syllogism.

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Introduction

1. Assertoric Propositions

We first need to explain what Aristotle understands of propositions and, more specifically, which propositions are the basis for syllogism. In paragraph 16b26, truth and falsity exist as some characters of logos; accordingly, these are noted as affirmation and negation in paragraph 17a1. Thus, 'proposition-being logos', which is an affirmation or negation (17a8-9), also has truth-value. This Aristotelian understanding of proposition, by virtue of its having a truth-value, can be understood with the contemporary term 'proposition'. So, one kind of logos is the proposition. And Aristotle classifies these propositions as 'simple' (ἁπλόος). Aristotle give the definition of 'simple proposition' (ἁπλῆ ἀπόφανσις):

(17a23-24) The simple proposition is a significant spoken sound about whether something does or does not [belong to], [according to] the divisions of time.

This is because a proposition is simple, asserting only one truth-value (20b10-12). Every simple proposition is either true or false. But as every non-simple proposition makes more than one affirmation or negation, hence it has more than one truth-value.

Consider another of Aristotle's definitions, this one of 'premise' (πρότασις), from *Analytica Priora* (24a15). According to this definition, premise corresponds to proposition. But premise requires emphasizing the simple character of assertion:

(24a28-30) Therefore, a deductive πρότασις will be an [simple] affirmation or [negation] of something [to] something in the way we have described

In any syllogism, propositions must be simple; syllogisms can only be made up of them (34b7-18). In this case, we can say that premise is equivalent to simple propositions. The premise concept and study in *Analytica Priora* are different, however, than Aristotle's understanding of propositions in *De Interpretatione*. Also, Crivelli and Charles remark that

he [Aristotle] applies 'πρότασις' to the conclusion of a syllogism. Thus, 'πρότασις' does not, in the *Prior Analytics*, refer only to the premises from which the conclusion is derived. It follows that 'πρότασις', as used in

the *Prior Analytics*, is not coextensive, nor equivalent in sense, with 'premise'. (Crivelli & Charles, 2011, p. 198)

Thus, it is understood that both premises and conclusion of the syllogism, i.e. as premise, must be simple.

Simple propositions and premises are two forms: 'belongs to' (ὑπάρχει) and 'does not belong to' (μὴ ὑπάρχει). The expression that 'belongs to' is affirmation (κατάφασις) as 'τινὸς κατὰ τινός', and the expression that 'does not belong to' is negation (ἀπόφασις) 'τινὸς ἀπὸ τινός'. Here the expression 'τινὸς' corresponds to 'φάσις', which means verb (ῥῆμα) and name (ὄνομα), and this relation is made by the act itself being the verb or by being connected with 'to be' (εἰμί). However, since a grammatical approach is not suitable for formal application, Aristotle makes this distinction as 'τινὸς κατὰ τινός' over 'belongs to' (ὑπάρχει) and 'does not belong to' (μὴ ὑπάρχει) for premise. In this case, affirming (καταφατικὸς) is 'τινὸς κατὰ τινός ὑπάρχει', and negating (ἀποφατικός) is 'τινὸς κατὰ τινός μὴ ὑπάρχει'. How this difference operates is clear in the following expression:

τὸ A παντὶ τῷ B ὑπάρχει ἢ μὴ ὑπάρχει (35b5)

Aristotle shows, in this notation, examples of both universal affirmative and universal negative premise. So we understand this is a negative predication of the verb. Aristotle has examined this equivalence '$BaA\bar{} \equiv BeA$' in *De Interpretaione* X. Thus, Aristotle builds his theory on these four premises. Aristotle gives the rule about predication as follows:

(1b10) Whenever one thing is predicated of another as of a subject, all things said of what is predicated will be said of the subject also.

and

(24b27-30) That one term should be in another as in a whole is the same as for the other to be predicated of all of the first. And we say that one term is predicated of all of another, whenever nothing can be found of which the other term cannot be asserted; 'to be predicated of none' must be understood in the same way.

According to Aristotle, his assessment that what is included in the subject will also be included in the predicate does not follow from these paragraphs. Clearly, the presence of the predicate in the subject is due to

the predication of what is predicated of the predicate to the subject. Thus, in the expression AaB, it is understood that every predicate predicated of A is predicated of B.

2. Necessity (ἀναγκαῖον)

Predication of simple propositions must be one (εἷς). If predication is many (πολὺς), then there is one affirmation or more than one affirmation. But this multiple or apparent many must be understood as one affirmation to be in a single action (τὲ ἓν κατὰ πολλῶν) (20b12-15). According to Aristotle, all syllogisms are set up with only simple propositions; therefore, he constructed his logic with using only simple propositions (34b7-18). Simple propositions, on the one hand, are ordinarily constructed by one verb. On the other hand, however, they can include more than one verb, provided that these verbs in combination resolve to one. Aristotle explains how combination of more than one verb works as two rules in *De Interpretatione* XI:

(1) One of the verbs will not be an accident of the other, and all verbs will not together be an accident of the subject.

(21a7-10) Of things predicated, and things they get predicated of, those which are said accidentally, either of the same thing or of one another, will not be one.

But this does not mean that the verbs' actions are contained in each other.

(21a16) Further, where one of the things is contained in the other, they will not be one.

Consider the proposition that "Socrates is good cobbler." 'Socrates' is contained in 'to be cobbler', but is not contained in 'to be good'; i.e. in this proposition, "Socrates is cobbler" is said, but "Socrates is good" is not said. Even if it were possible to say that "Socrates is good", the sense of 'good' here is not 'good' as in being a 'good cobbler'. 'Good' and 'cobbler' are not accidents of one another; further, this sense of 'good' is not an accident of 'Socrates'.

(2) Any new combined predication must be contained in the main verb (which is an accident of subject) or must be contained in the main verb's opposite.

(21a18-23) It is true to speak of the particular case even without qualification; ... Not always, though. When in what is added some opposite is contained from which a contradiction follows, it is not true but false, ...

'To be good cobbler' is contained in 'to be cobbler'. For this reason, if "Socrates is good cobbler" is true, then "Socrates is cobbler" is true as well. Further, a verb's predication to its subject is not essential: if a verb is contained in the opposite of a proposition's main verb, then the main-verb does not predicate to the subject. E.g. for the proposition "Socrates is dead man," 'to be dead' is contained in opposite of 'to be man', so it is true that "Socrates is no-man".

For other situations we can construct propositions[1], but these will not be as simple. There is no syllogistic application for this kind of proposition, because premises must be simple.

With these initial definitions set out, Aristotle starts *De Interpretatione* XII with the following passage:

(21a34-37) Having cleared up these points, we must consider how negations and affirmations of the possible to be and the not possible are related to one another, and of the admissible and not admissible, and about the impossible and the necessary. For there are some puzzles here.

Right after, he explains negation of modal propositions. From this statement, it is clear that Aristotle's way of understanding the structure of the modal propositions can be seen in section XI. Modals, combined with other predication, create modal propositions according to these rules. However, Aristotle distinguished how modals are negated in chapter XII. In this case, if we develop modal constructions in accordance with the explanations in Chapter XI, the relation between modal propositions and assertoric propositions will be discoverable.

In the case of the proposition "Socrates is good cobbler", 'cobbler' is predicated to 'Socrates', but 'good' does not also predicate to 'Socrates'. 'To be good cobbler' is contained in 'to be cobbler'. For modal proposi-

[1] For instance "Socrates is Irish and man" is false. This is a proposition but not a simple proposition. It can be divided as "Socrates is Irish" is false and "Socrates is man" is true. "Socrates is Irish and man" has two affirmations. According to Aristotle, we can construct this as "Socrates is Irish man." This proposition is false, and it has only one truth-value. So, "Socrates is Irish man" is simple proposition.

tions, combination between 'necessary' and 'to be' uses like 'good' and 'cobbler'. When "Socrates necessarily is cobbler" is stated, the same situation appears: 'to necessarily be cobbler' is contained in 'to be cobbler'.

In another example, for the proposition that "Socrates is dead man", 'man' does not predicate to 'Socrates'. Here 'dead man' seems to operate like 'to impossibly to be'. When "Socrates impossibly is man" is stated, the same situation appears: 'to impossibly be man' is contained in the opposite of 'to be man'.

In assertoric propositions, statements of modality are not used. For example; "Socrates is cobbler" and "Socrates is good cobbler" are assertoric propositions. They become modal propositions by adding modal terms, e.g., "Socrates necessarily is cobbler" and "Socrates necessarily is good cobbler."

Thus, we see that what is predicated necessarily is predicated of the subject by another predicate. There is a second predicate that makes the predicate necessary, and by saying that it is predicated 'necessarily', we say that this predicate is also predicated of the subject.

This structure is a new predication. Here, adding by modals, predication has been modal-predication, e.g 'to belong to' has been 'to necessarily belong to'. Also this is reason for the differences in the negations.

Assertoric propositions do not appear to be connected with modality. For example, in the statement that "human is animal", the verbal predicate 'to be animal" predicates to 'human' necessarily. But this modality cannot be discovered just from understanding a proposition; rather it comes from the terms' definition. The definition of 'man' and 'animal' insists that " human is animal" is equivalent to the further claim that "human necessarily is animal." This situation generates some logical fallaciousness. It is obvious that there will be invalid conclusions from syllogisms if modality is used as in colloquial speech. So modal propositions must be expressible as assertoric propositions. Besides that, it is not essential assertoric propositions have a modality. Aristotle gives the proposition "every human is animal" (26a8; 26b8; 28a32; 30b33), but it is also interesting that he gives the necessary form of this proposition as "every human is necessarily animal" (30b5; 31b40). As can be seen in Aristotle's

other examples "every swan is white" (27b26; 27b33) and "every swan is necessarily white" (36b11; 38a11) and "every snow is white" (27b34) and "every snow is necessarily snow" (36b12), it is possible that assertorically given emphases can contain modal structures.

In this context, the question of how modality operates in propositions is an open question. This relationship between the subject and the verb, i.e. that the verb is necessary, impossible, or contingent for some subject, is a metaphysical argument. Our concern here is only to discover structural features of this relationship.

Aristotle uses that necessity operates in two ways: on the one hand, necessity of the premise (holding statement); on the other hand, it functions as a relationship (συμπλοκή) between the subject and the verb (belong to). If a premise is a conclusion from a syllogism (ἐξ ἀνάγκης συμβαίνει), this premise is necessary (24b19); this understanding is concerned with preserving the validity of the premise. Aristotle gives this necessity as 'ἀνάγκη δὴ', here it is vocative structure for premise; "ἀνάγκη δὴ τὸ A παντὶ τῷ B ὑπάρχειν".

(1015b7-9) demonstration is a necessary thing, because the conclusion cannot be otherwise, if there has been demonstration in the full sense; and the causes of this necessity are the first premises, i.e. the fact that the propositions from which the deduction proceeds cannot be otherwise.

We can understand from this paragraph that this sense of the necessary explains a proposition's validity.

If we hear "I have to go to school", we may ask "why?" We can recompose this statement as "it is necessary that I go to school." This statement's necessity is that which comes from causality. This cause is a middle term in a syllogism (i.e an exam, etc.). The statement "I go to school" is necessary because we get it from a syllogism; it is the necessary conclusion of the syllogism.

So, if we take necessity in its standard meaning, i.e. to be contained in the main-verb, as L_1, and the impossible, i.e. to be contained in the main-verb's opposite, as L_2. Here, for impossible constructions, there is

the existence of a predicate that does not make its predication possible. Thus, the two necessary constructions appear as opposites.

1. Every animals is necessarily mortal ≡ It is impossible that no animal is mortal

$$L_1AaB \equiv L_2AeB$$

2. No animal is necessarily immortal ≡ It is impossible that every animals to be immortal

$$L_1AeB \equiv L_2AaB$$

So no matter what modalities are suggested, if the proposition is obtained at the conclusion of a syllogism:

ἀνάγκη δὴ τὸ A παντὶ τῷ B ὑπάρχειν

ἀνάγκη δὴ τὸ A παντὶ τῷ B ὑπάρχειν ἐξ ἀνάγκης

ἀνάγκη δὴ τὸ A ἐνδέχεσθαι παντὶ τῷ B ὑπάρχειν

Because this does not explain the relationship between the subject and the verb, it shows that this relation is based on a cause.

If this proposition, however, is taken as a premise for the syllogism, necessity must be evaluated according to predication, not as preserving validity. It will be necessary with reference to "belong to" (ἐξ ἀνάγκης ὑπάρχειν); "τὸ A παντὶ τῷ B ὑπάρχειν ἐξ ἀνάγκης." Here, the verb belongs to the subject, this belonging is via necessity.

That which must necessarily be the case is contained in the main-verb; that which prevents what must be the case is contained in the opposite of the main-verb. To avoid this situation, Aristotle gives another kind of necessity: the impossible (ἀδύνατον). In this case, two senses of necessity are mentioned: the first sort of necessity is contained in the verb; the second is contained in the verb's opposite. Thus, "to impossibly be" is "to necessary not-be," and the correlation between them can be established in the light of 22a38-b10.

Aristotle, in 29b33, claims that terms of modal propositions are not connected in the same way as in assertoric ones. We have to look at the paragraph below to see how Aristotle established the connection between terms in a modal proposition:

(24a16) I call a term that into which the [premise] is resolved, i.e. both the predicate and that of which it is predicated,...

We can express this situation as; "τὸ A τῷ B παντὶ ὑπάρχειν," where "τὸ A" is part of "καθ' οὗ τὸ B," And, if we take it to mean necessity, "τὸ A τῷ B παντὶ ὑπάρχειν ἐξ ἀνάγκης," where "τὸ A" is part of "καθ' οὗ τὸ B ἐξ ἀνάγκης." So, with this in mind, if we take all subjects, that are predicated as necessary for a verb, into a set; it is represented with LB, and it will be included in B. It is necessary because proposition is simple.

Patzig says that the necessity to be taken as a result of the syllogism as a relative necessity is Aristotle's finding. He thinks that absolute necessity and relative necessity are Aristotle's mistakes (Patzig, 1968, p. 33). However, our evaluation here is that in both cases there is a second predicate that determines the relation between subject and predicate. This gives a complete predicate structure.

3. Contingency (ἐνδεχόμενον)

Aristotle, in spite of his setting out one notion of contingency (ἐνδεχόμενον) in *De Interpretatione*, claims to say (λέγεται) that this notion is many (πολλαχῶς) in *Analytica Priora* (25a37), and further clarifies that this many is two (δύο) (32b5). There are, for Aristotle, two senses of contingency.

The fact that the notion of possibility (δυνατόν) is expressed in *De Interpretatione* and is not examined in *Analytica Priora* leads readers to misconstrue the second definition of contingency as possibility. The greatest support for this thesis is the existence of the notion of 'ἀναγκαῖον' in "τὸ γὰρ ἀναγκαῖον ὁμωνύμως ἐνδέχεσθαι λέγομεν" (32a20-21).[2] However, the concept of 'ὁμωνύμως' (homonymous) is noted here, but then it is said that the concepts and definitions of 'ἀναγκαῖον' and 'ἐνδεχόμενον' are different.

We see two definitions for the concept of contingency in Aristotle's work. The first of these is

Q_1. (32b5-10) In one it means to happen for the most part and fall short of necessity, e.g. a man's turning grey or growing or decaying, or

[2] See the definition of 'ὁμωνύμως' at *Categoria* 1a1-3.

generally what naturally belongs to a thing (for this has not its necessity unbroken, since a man does not exist forever, although if a man does exist, it comes about either necessarily or for the most part).

This definition is operative in those cases where something happens for the most part (ἐπὶ τὸ πολὺ) and in those cases where the necessary is interrupted (διαλείπειν τὸ ἀναγκαῖον). Here, contingent predication is accepted as contained in a premise's main-verb.

Aristotle gives a second definition of contingency:

Q_2. (32b10-13) In another way it means the indefinite, which can be both thus and not thus, e.g. an animal's walking or an earthquake's taking place while it is walking, or generally what happens by chance; for none of these inclines by nature in the one way more than in the opposite.

This definition builds on the indefinite (ἀόριστον) and that which is possible thus and not thus (καὶ οὕτως καὶ μὴ οὕτως δυνατόν).

Aristotle gives two definitions for 'ἐνδεχόμενον' because without both together, contingency is not contained in the main-verb or in the opposite of the main-verb. Then, the contingent proposition cannot be simple. To avoid this result, Aristotle divides the contingency into two definitions, which allows 'to contingency be' contained in the main-verb or in the main-verb's opposite. For instance, we can see contingency Q_1 in the example that "man contingently is two footed." 'Man' is contained in 'two footed', so it can be said that "man is two footed." For the sense of contingency Q_2, in the proposition "man contingently is flying," 'man' is contained in 'not-flying', so it cannot be said that "man is flying."

Although Aristotle's scientific system is centered on necessary premises, it is not composed entirely of them. It would be impossible to do science if one used only necessary premise. Indeed, Aristotle intended to reveal the method of science rather than to carry it out by necessary deduction. His notion of necessity must declare that some relationship is valid all the time. This structure cannot be used in answering or evaluating some scientific problems in domains such as history. This same problem also arises for assertoric premise, especially in biology. Aristotle solves this impasse by taking contingent premise in scientific research as 'to happen for the most part' and 'interrupted necessity'. For example:

Every politician is an orator (X)

Churchill was a politician(Q_L)

So, Churchill was an orator (Q_I)

Aristotle says that "What is, necessarily is, when it is; and what is not, necessarily is not, when it is not" (19a23). In the above syllogism, if we take the second premise as necessary, for XLL form, the conclusion then must be assertoric. But the conclusion is necessary. For this to occur, according to Aristotle's system, the necessity must be interrupted necessity. But, if the second premise is contingent, then the conclusion is too. Thus, this syllogism is XQQ form. Consider a further example:

Every walker necessarily is footed (L)

Every man is a walker (Q_X)

So, every man is footed (Q_X)

In this syllogism, if we take the second premise as assertoric, for LXL form, the conclusion must be necessary. But this conclusion is not necessary. For this to occur, according to Aristotle's system, what the second premise states to happen must be only for the most part. So, the second premise is contingent, and thus the conclusion is too. This syllogism is then LQQ form.

In these circumstances, we can say that Aristotle's intention in understanding contingency is his first definition, Q_1. We can then set all contingency as follows:

Q_1 Affirmative contingently belongs to and belongs to

Q_1 Negative contingently does not belong to and does not belong to

Q_2 Affirmative contingently belong to and not-belongs to

Q_2 Negative contingently does not belong to and not-does not belong to

The relation as QAaB ⇔ QAeB in 32a34, I think must be

Q_1AaB ⇔ Q_2AeB

Q_2AaB ⇔ Q_1AeB

We can see this relation comes up in necessity.

4. Negation

Aristotle gives an analysis of negation of modality in *De Intepretatione* XII. According to this chapter, negations of modality are

Contingency to be $\xrightarrow{negation}$ to not-contingently be

Necessary to be $\xrightarrow{negation}$ to not-necessary be

If a proposition is true, then its negation must be false. But every false proposition is not its negation. The proposition and its negation are contradictories (αἱ ἀντικείεναι) (17a32-34). Besides, Aristotle has shown in *De Intepretatione* XIII that the situation with negating modality is different. Negations of modal propositions will emerge through contraries (αἱ ἐναντίαι). Because it is not the verb that is negated, it is instead an instance of negated modality. For example

Every man is just $\xrightarrow{contrary}$ Every man is not-just $\xrightarrow{is\ equal\ to}$ No man is just

and for modal propositions,

Every man necessarly is just $\xrightarrow{negation}$ Every man not-necessarly is just

$\xrightarrow{is\ equal\ to}$ No man contingently is just

Aristotle analysed which propositions are contraries in *De Interpretatione* XIV, where he showed that

(24b2-4) clearly it is the universal negation about the same thing that is contrary to an affirmation, ...

In this situation, we have following negations:

$\sim L_1AaB \equiv Q_1AeB$- $\sim Q_1AaB \equiv L_1AeB$

$\sim L_1AiB \equiv Q_1AoB$ - $\sim Q_1AiB \equiv L_1AoB$

$\sim L_1AeB \equiv Q_1AaB$ - $\sim Q_1AeB \equiv L_1AaB$

$\sim L_1AoB \equiv Q_1AiB$ - $\sim Q_1AoB \equiv L_1AiB$

$\sim L_1AaB$ is "Every A not-necessarily is B," to put it more explicitly "Every taking one by one in A not-necessarily is B." So this corresponds to a universal negation. From $\sim Q_1AaB \equiv L_1AeB$ and 'to necessarly not-be'

is equivalent to 'to impossibly be', 'to not-contingently be' is equivalent to 'to impossibly be', i.e. ~Q_1AaB ≡ L_2AaB.

5. Conversion

Aristotle explains conversion of the premise in *Analytica Priora* A. II & III. Moreover, he enunciates two different conversion for contingency in chapter III and XVII. Aristotle investigated there is no conversion of the contingency for syllogisms as follows (36b35):

$QAeB \not\equiv QBeA$

$QAeB \equiv QBeA$ Assume

$QAaB \equiv QBaA$ This is contradiction.

Elsewhere, he mentioned that this conversion is obtained for another kind of the contingency (25b3-5). According to the second definition of contingency, Q_2, contingent premise can be convertible; Q_1 contingent premise, however, cannot be convertible.

$Q_1AeB \Leftrightarrow Q_1BeA$ Assume

$\sim L_1AaB \Leftrightarrow \sim L_1BaA$ This is contradiction.

Also

$Q_2AeB \Leftrightarrow Q_2BeA$ Assume

$\sim L_1AeB \Leftrightarrow \sim L_1BeA$ This is not a contradiction.

In this case, the conversions of the premise can be given as follows

AaB → BiA (25a17)

AiB → BiA (25a20)

AeB → BeA (25a15)

~~AoB → BoA (25a17)~~

Q_2AaB → Q_2BiA (25a39)

Q_2AiB → Q_2BiA (25a39)

Q_2AeB → Q_2BeA (25b5)

~~Q_2AoB → Q_2BoA (25b13)~~

L_1AaB → L_1BiA (25a32)

L_1AiB → L_1BiA (25a32)

L_1AeB → L_1BeA (25a29)

~~L_1AoB → L_1BoA (25a32)~~

Q_1AaB → Q_1BiA (25a39)

Q_1AiB → Q_1BiA (25a39)

~~Q_1AeB → Q_1BeA~~ (25b16, 36b35)

Q_1AoB → Q_1BoA (25b17)

In addition, we may add the following situations for impossible forms of necessity

$L_2AaB \rightarrow L_2BiA$

$L_2AiB \rightarrow L_2BiA$

~~$L_2AeB \rightarrow L_2BeA$~~

$L_2AoB \rightarrow L_2BoA$

6. Not Taking Problematic (δυνατὸν) Propositions as Premise

Aristotle investigated problematic propositions and their features in *De Interpretatione*, however he gave no syllogism constructed of them. Premise must be simple in scientific demonstration (24a28-30); it can be constructed with only them (34b7-18). Aristotle articulates that problematic propositions cannot be expressed simply (23a7). Thus problematic propositions cannot be premises, so we cannot construct with them. Also, they cannot be produced as conclusions, because we have stated that these conclusions must be premises.

7. Syllogism in the Barbara and Celarent Forms by Modal Premise

Because all forms can reduce to Barbara and Celarent in Aristotle's theory of the syllogism, it is simpler to prove the modal circumstances of them instead of working through all possible forms.

In assertoric propositions, the statement in the form of AaB already gives the form of Barbara by itself due to the definition that what is predicated of B will be predicated of A. Since, according to the definition of AeB, what is not predicated of B will be predicated of A, it follows that what is not predicated of B will be predicated of A.

In LAaB, the predication of B to A is realised by a Z predicated to A. In the case of ΓaA, the predication of A to Γ and the predication of B to Γ are realised by Z. Because with the predication of A to Γ, B and Z predicated to A are also predicated. In other words, B is predicated to Γ necessarily. It should be noted here that the presence of Z in A does not necessitate the presence of A in Γ. Because Z will necessitate B. Paying attention to the example of "death by slaughtering" given by Aristotle as necessary, let us take A="animal", Z="slaughtering", B="dying". Here, it is necessary for the slaughtered animal to die. Because the animal is predi-

cated of being slaughtered and dying. In other words, Z is predicated of A by the slaughter of the animal, and B is predicated of A by the death of the animal. In the death of the slaughtered animal, we see that B and Z are predicated of A, and B is predicated of A through Z. Thus, the death of the animal is necessarily predicated of slaughter. If we take a Γ="goat" predicated of A, then death will necessarily be found in the goat. This is because slaughter in the goat is predicated of the animal. Γ will be predicated by B and Z, and B will be necessarily predicated by Z.

Syllogisms with contingent premises cannot be stated with indefinite terms, otherwise the middle term is uncertain (32b18-22). We will understand contingency for premises as the kind articulated in Q_1. So, in the syllogism, Q is Q_1, and L is L_1. Aristotle mentions how to construct a syllogism with contingent premises in the last paragraph of *Analytic Priora* A. XIII.

(32b24) our business at present is to state when and how and what deductions can be made from [contingent premises].

Aristotle expresses that contingent syllogisms are produced in two ways:

(32b25) The expression 'it is [contingent] for this to belong to that' may be taken in two ways: either 'to which that belongs' or 'to which it may belong';

These syllogisms are made with assertoric or contingent premise. So,

(32b27) for 'A [contingently] be said of that of which B' means one or other of these—either 'of which B is said' or 'of which it [contingently] be said'; and there is no difference between 'A [contingently] be said of that of which B' and 'A [contingently] belong to every B'.

Aristotle approaches the situation that both premises are contingent, with a suitable definition for the syllogism as Barbara:

(32b32) First then we must state the nature and characteristics of the deduction which arises if B [contingently] is of the subject of C, and A [contingently] is of the subject of B.

Here both premises are contingently. However, he indicates that this situation is formed with only the first premise as contingent.

(32b34) For thus both [premises] are assumed in the mode of [contingent]; but whenever A is [contingently] of the subject of B, one is [assertoric], the other [contingent].

Here, then, we see first premise is contingently and second is assertoric.

In this case, we can express the pefect syllogisms established by Aristotle in Barbara and Celarent forms as Barbara-XXX (25b37), Celarent-XXX (25b40), Barbara-LLL (29b36), Celarent-LLL (29b36), Barbara-LXL (30a17), Celarent-LLL (30a17), Barbara-QQQ (32b38), Celarent-QQQ (33a1), Barbara-QXQ (33b33), Celarent-QXQ (33b36), Barbara-QLQ (36a2), Celarent-QLQ (36a17).

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Öz: Aristoteles'in modal önermelere ilişkin görüşleri, ardıllarından bu yana akademisyenler arasında tartışma ve araştırma konusu olmuştur. Bu çalışma, Aristoteles'in tasdiksel ve modal önermeleri nasıl tanımladığını ele almakta ve bu önermeler ile tasdiksel önermeler arasındaki ilişkilere açıklık getirmektedir. Geleneksel olarak yorumcular önermeleri, özneye ait olanın yükleme de ait olduğu önermesine dayanarak yorumlamışlardır. Ancak bu araştırmada önermeler, yükleme yüklenen şeyin özneye de yükleneceği önermeler olarak yorumlanmaktadır. Bu araştırmanın sonucu, modal öncül sürecini, diğer tüm formları kapsayacak şekilde indirgenebilen ilk şekildeki Barbara ve Celarent kıyas formları üzerinden göstermektedir.

Anahtar Kelimeler: Aristoteles, kiplik, zorunluluk, olumsallık, kıyas.