

ARISTOTLE ON LANGUAGE PARALOGISMS

SophElen. c.4 p.165b-166b

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Contributed paper concerns the misleading ways of argumentation caused by ambiguity of natural language as Aristotle describes them in his writing *On Sophistical Refutations*. It will be shown that traditional and generally accepted interpretation of these paralogisms (especially of the third and fourth ones) is inappropriate and new solution will be proposed.

My contribution should be treated just as a small historical remark. It concerns those misleading ways of argumentation (so-called paralogisms), which are caused by ambiguity of natural language as Aristotle describes them in the fourth chapter of his writing *On Sophistical Refutations*.

This topic is not of crucial importance. Usually, it is briefly mentioned if mentioned at all. Moreover, it seems that one author assumes this short remark from another author without checking it in original source since it is not worth such attention. However, I am persuaded that this generally accepted interpretation of the third and fourth of these paralogisms is inappropriate and should be corrected.

Aristotle's Exposition

Let me begin with a brief summary of Aristotle's paralogisms. In the fourth chapter of his writing *On Sophistical Refutations*, Aristotle describes six sources of confusion in argumentation where the mistake is caused by ambiguity of (natural) language. He names them as homonymy, amphiboly, combination, division, accent and grammatical form. All of them originate in equivocity (polysemy), the fact that words, phrases or sentences can have more than only one meaning. The main problem of their interpretation lies in the fact that Aristotle does not explain their nature in detail. He only shows examples.

The mistake of **homonymy** roots in the equivocity of words. One word is used in two different meanings in one argument. In this case it can happen that an argument with quite a strange conclusion looks plau-

sible. Homonymy was frequently used with Sophists in their sophismatas.

Example: *Evils are good; for what must be is good, and evils must be.*¹

The phrase „*must be*“ is homonymous. It is used in two different meanings in premises of this argument. It means that what is good *ought to be* in the first premise, while in the second one the very same phrase means that evils are *inevitable*. Hence the strange conclusion.

Amphiboly is the equivocity of the whole sentence, not only of a word, as we have seen in the case of homonymy. It may rest upon two different facts:

Firstly, one word has at least two different meanings. But in this case, the equivocity of one word causes the equivocity of the whole sentence. (While in the case of homonymy, the homonymous word is used in two different meanings in two sentences but both these sentences have clear and only one meaning.)

Example 1: *There must be a sight of what one sees: one sees the pillar: ergo the pillar has sight.*

Here again, the word „*sight*“ is obviously homonymous. It means that *something is seen* as well as the *ability of seeing something*. According to these two different meanings of one word the first premise (the whole sentence) has two different readings. Thus the ambiguity of one word causes the ambiguity of the whole sentence and allows invalid arguments.

Secondly, all words of the sentence have (one) clear meaning but their connection results in an ambiguous sentence.

Example 2: *I wish that you the enemy may capture.*

In this case, it is not clear whether the speaker wishes to the addressee to capture an enemy or to be captured by an enemy. The sentence allows both of these possible readings. However, ambiguity of this sentence is not caused by the ambiguity of one word or phrase but by the ambiguity of the connection of words into the sentence.

Usually, amphiboly (especially the second type) can hardly be used to construct a false argument intentionally, but it may cause a misunderstanding in argumentation or communication.

¹ All the translations of Aristotle's examples as well as all the quotations are assumed from the [2].

The third and fourth paralogsms – the mistakes of wrong **combination and division** (about which I want to talk above all) – are caused by the fact that words, which should stay separated, are connected in a sentence (respectively, words which should be connected are separated). Aristotle shows the following examples:

Combination:

A man can walk while sitting, and can write while not writing.

He knows now if he has learnt his letters.

One single thing if you can carry many you can carry too.

Division:

Five is two and three. Two and three are even and odd. Five is even and odd.

I made thee a slave once a free man.

God-like Achilles left fifty a hundred men.

The paralogsms of **accent** is closely connected with the Greek language where two different words can differ only in accent. Thus it is sometimes hard to recognize which word is used in a written text (since accents are not written). However, this paralogsms is quite often (wrongly) interpreted as a misunderstanding caused by diction, for example by speaking in an ironical voice and so on.

The last paralogsms, the paralogsms of **grammatical form**, lies in the fact that two different grammatical categories can have the same appearance, the grammatical form. Thus the confusion can be caused by not being obvious (from grammatical form) whether the word is a noun or a verb and so on. This mistake is also closely connected with the Greek language (and other classical languages as well) where such a confusion is much more frequent and can be much more fatal than in modern languages.

Anyway, I am convinced that these two paralogsms, i.e. accent and grammatical form, are special cases of the first two paralogsms – homonymy and amphiboly.

Generally Assumed Interpretation of the Third and Fourth Paralogsms

I have compared various textbooks of argumentation and informal logic as well as philosophical dictionaries and encyclopaedias because these are the books with which students work above all. And my opinion is that the generally assumed interpretation of the third and fourth paralogsms

gisms presented in those books is not correct. It is at least too narrow if not completely inappropriate. Traditionally, the third and fourth paralogisms are interpreted there as a confusion of attributes of parts of a whole with attributes of the whole itself; respectively as a mistake of reasoning invalidly from attributes of parts of a whole to attributes of the whole itself. Let me mention several quotations for all of these books:²

Division and combination are mistakes where the properties of parts of a whole are ascribed to the whole itself and vice versa.

Example: *Sodium (Na) and Chlorine (Cl) are poisonous. Thus salt (NaCl) is poisonous.*³

The fallacy of combination is the error of arguing from a property of parts of a whole to a property of the whole. But a property of the parts cannot always be transferred to the whole. In some cases, examples of the fallacy of composition are arguments from all the parts to a whole.

Examples: *The important parts of this machine are light; therefore this machine is light.*

*Everybody in the country pays his debts. Therefore the country pays its debts.*³

The fallacy of division is the converse of that of composition: it is the error of arguing from a property of the whole to a property of its parts. The problem is that the property possessed by the whole need not transfer to the parts.

Example: *This machine is heavy; therefore all the parts of this machine are heavy.*³

Division is a mistake where the middle term of syllogism is ascribed to the whole set of individuals in the major premise, while in the minor premise it is ascribed to the individuals of this set. (The converse is the mistake of **combination**.)

Example: *Books are the treasury of human knowledge. Comics are books. Thus comics are the treasury of human knowledge.*⁴

² The following list is not exhaustive. It presents principal variations of standard interpretation assumed from textbook or encyclopaedia being easily available and serving only as a representative of much larger set of books containing the very same conception.

³ [7], 96; [8], 65; [4], Subject word: Informal Fallacy.

⁴ [5], 101 - 104; [6], Subject words: Paralogismus spojení, Paralogismus rozdělení.

Combination is a mistake where the predicate is used distributively (it refers to each and every thing of a specified kind) in the premises while in the conclusion it is used collectively (it refers to the totality of them).

Examples: *Why do white sheep eat more than black ones? Because there are more of them.*

*The cognition of all people is limited. All the people are the mankind. Therefore, cognition of the mankind is limited.*⁴

Proposed Interpretation

I have already mentioned that the problem in interpreting this text by Aristotle lies in the fact that he does not explain the nature of individual paralogsms but only shows examples. However, when looking at his examples, it is obvious that the usual interpretation of the third and fourth paralogsms suits only to the first one of these examples (the example that two and three are five). This is also the only Aristotle's example mentioned in those books. On the other hand, this interpretation is completely inadequate in the case of the rest of those examples. Which property is ascribed firstly to the individuals and secondly to the set in the examples with Achilles or the slave? There is no such a property, no confusion of attributes of a whole with attributes of parts of this whole.

The confusion of attributes of parts of a whole with attributes of the whole itself (or the mistake of ascribing the same property to the set and then to the individuals) is a factual mistake. It is a mistake caused by wrong understanding, not by the ambiguity of language. But Aristotle explicitly states that he is going to talk only about mistakes caused by language. He wants to describe the ways in which the same words or phrases may express things, which are not the same; in his own words: „the ways in which we might fail to mean the same thing by the same names or expressions”(Aristotle, *SophElen.*, c.4 p.165b). In modern words: to describe the ways in which the syntax of natural languages does not express the meaning (semantics) adequately, respectively uniquely. Thus the usual interpretation of the third and fourth paralogsms contradicts the intention of the whole passage. I can see no reason why these two paralogsms should be interpreted in such a completely different way than the other ones.

According to Aristotle's examples shown above, I am persuaded that the mistakes of wrong combination and division originate elsewhere than in the confusion of attributes of parts of a whole with attributes of the whole itself. Incorrectly connected or divided are the parts of the sentence, not the things or properties. Combination and division are just other ways of equivocity of a sentence – the syntactical (structural) equivocity. Such equivocity of a sentence is not caused by the equivocity of a word or phrase but by the ambiguity of the structure of that expression, which allows more than only one way of reading. In my opinion, the following quotation exemplifies that Aristotle meant the structure of a sentence and not the structure of things when he wrote about the paralogisms of combination and division.

Aristotle, *SophElen.*, c.4 p.165b – 166b; paragraph concerning combination: „For the meaning is not the same if one divides the words and if one combines them in saying.”

Aristotle, *SophElen.*, c. 4 p.165b – 166b; paragraph concerning division: „For the same phrase would not be thought always to have the same meaning when divided and when combined.”

Removal of Language Paralogisms

Another argument for my opinion is as follows: The language paralogisms are fallacies caused by ambiguity of natural languages – the fact that the syntax of natural languages does not uniquely correspond to its semantics. Therefore these paralogisms do not touch formal languages. The ambiguity of those natural language sentences should disappear as soon as they are transformed into the formal language since formal languages have strict rules how to create correct statements; it is impossible to create an ambiguous expression within any formal language because they were formed in such a way that the relation between their syntax and semantics is unambiguous. In other words: an ambiguous sentence of natural language can be translated (analyzed) in more than only one way into formal language – one analysis for each of its different meanings. Introduction of simple but stricter formal rules may remove all these fallacies, respectively may remove the ambiguity of those natural language sentences. Even so much criticized predicate logic has enough expressive power to do so.

Thus the first paralogism of **homonymy** can be easily diminished through introducing different predicate variables or constants for each meaning of an ambiguous word or phrase.

Example: *Evils are good; for what must be is good, and evils must be.*

The phrase „*must be*” of our example is used in two different meanings. In the first premise it means that good (G) *ought to be* (O), while in the second premise it means that evil (E) *is inevitable* (I). Therefore, two different predicate letters for this phrase should be introduced during the formalization and the argument is obviously invalid:

$$\forall x (O(x) \rightarrow G(x))$$

$$\forall x (E(x) \rightarrow I(x))$$

$$\forall x (E(x) \rightarrow G(x))$$

Similarly, the paralogism of **amphiboly** can be removed during the formalization through introducing the correct predicate (in the first type of amphiboly) or individual variables and constants (in the second case).

Example 1: *There must be a sight of what one sees: one sees the pillar: ergo the pillar has sight.*

This is the example of the first type of amphiboly – the equivocity of one word causes the equivocity of the whole sentence. The word „*sight*” in the first premise can mean that *something is seen* as well as *the ability of seeing* something. Here, again, the introduction of two different predicate variables removes the ambiguity and distinguishes between both possible readings of the sentence.

Example 2: *I wish that you the enemy may capture.*

This is the example of the second type of amphiboly – all words of the sentence have one clear meaning but their connection into the sentence is ambiguous. In this case it is not clear whether the speaker wishes the addressee to capture an enemy or to be captured by an enemy. This type of amphiboly can be removed through introducing individual variables since there is an apparent distinction between expressions „*capture(you, enemy)*” and „*capture(enemy, you)*” while the original sentence admitted both of these readings.

And finally, it is possible to do the same with the third and fourth paralogisms of **combination and division**. We just admit a new, more precise convention into our way of writing sentences and the ambiguity disappears. If we understand the paralogisms of combination and division

as mistakes in connecting words into a sentence, then the correct form of a sentence is just a matter of the proper use of punctuation, respectively the proper use of brackets in formal languages.

Examples – combination: *A man can walk while sitting, and can write while not writing.*

*One single thing if you can carry many you can carry too.*⁵

The examples mentioned above seem to indicate that the speaker assumes that it is possible to do and not to do the same thing at the same time (like to walk and to sit at once). This impression originates in incorrect combination of words of the sentence. If punctuation rules were stricter no such confusion could appear. I will not perform the precise formalization; I will just show the idea of removing this ambiguity through the proper punctuation or the use of brackets, respectively.

Incorrect reading of the first example: *A man can (walk and sit).*

Correct reading of the first example: *A man (can walk and can sit).*

The mistake consisted in fact that words „walk“ and „sit“ are combined while they should stay separated. More proper rules of punctuation would prohibit such a connection. The same applies to the rest of examples of combination.

The paralogism of division is just a converse of that of combination – the words, which should be connected, are separated in a sentence. Thus the same rules for punctuation can be used to remove them.

Examples – division: *Five is two and three. Two and three are even and odd. Five is even and odd.*

I made thee a slave once a free man.

The mistake of the first example consists in wrong analysis of the second premise – subjects and predicates of two distinct statements are separated from each other to form only one statement with one compound subject and one compound predicate so the strange conclusion can be inferred.

Incorrect reading: *(Two and three) are (even and odd).*

Correct reading: *(Two is even) and (three is odd).*

⁵ Unfortunately Aristotle used as examples for combination only modal contexts so my claim that predicate logic has enough expressive power to remove all of the language paralogisms seems to be too ambitious. However, the way in which the ambiguity of combination (as well as the ambiguity of division) is removed has nothing to do with modalities and can be used in non-modal context as well.

Within the argument of the first example, subject „two“ and predicate „even“ are wrongly divided to become a part of a compound subject „two and three“ and compound predicate „even and odd“ while they should stay connected into one statement.⁶

The second example presents an ambiguous sentence: „I made thee a slave once a free man.“ As soon as the more specific punctuation is added the ambiguity disappears since it is clear which parts of sentence should be separated (and which ones connected). The sentence admits two different readings as follows:

I made thee, a slave, once a free man.

I made thee a slave, once a free man.

In the first case the speaker says that he gave freedom to a slave while in the second case he says that he enslaved a free man. The punctuation makes clear which one of these two possible readings is meant.

So the ambiguity of those sentences can be again removed through introducing new formal tools into our language, which settle more precise connection between the language and its semantics. However, no such a language rule can be used to diminish the mistake of the confusion of attributes of a whole with attributes of its parts since this is not just a language mistake⁷. When it is possible to remove all the other (lingua-

⁶ It may be argued that this fallacy roots in the ambiguity of the word „and“, which can be understood as addition as well as the conjunction. Hence the whole example turns to be just homonymy since the word „and“ means addition in the first premise, while within the second one it is used for conjunction.

However this ambiguity is not primordial in the context of the second premise. The word „and“ can serve only as a conjunction there. Otherwise the sentence will be neither meaningful nor true. The question left opened, then, is whether this word is used as a conjunction between two terms or between two propositions. And this is exactly what the paralogism of combination and division means.

The mistake of this example is, however, twofold. The incorrect reading of the second premise (compound subject „two and three“) causes the incorrect reading of the first premise, where the word „and“ is understood as the very same conjunction between two terms and not as the addition so the first premise forms an interesting example of the first type of amphiboly. However, the ancient notion of addition (as well as the notion of numbers) was different then ours and not so sharply distinct from conjunction as it is the case in modern times. So the objection concerning the ambiguity of the word „and“ is not fully relevant.

⁷ It was claimed that the mistake of the confusion of attributes of parts of a whole with attributes of the whole itself is not a language mistake and cannot be removed through introduction of just a language rule. However, there is an exception. A special case of this mistake was presented in the last two quotations from textbooks (see chapter Generally

ge) paralogisms only through introducing more proper formal means into our language, why should we adopt for the third and fourth ones an interpretation, which does not allow the same treatment with all of them?

Conclusion

As I have already mentioned at the beginning, I am persuaded that the third and fourth of Aristotle's paralogisms – the combination and division – are not interpreted adequately in common textbooks, dictionaries and encyclopaedias. They are interpreted there as a confusion of attributes of parts of a whole with attributes of the whole itself; respectively, as a mistake of arguing from properties of parts of a whole to properties of the whole itself.

In my opinion, this interpretation is not appropriate. It contradicts the intention of the whole chapter and it is not suitable for the most of the examples mentioned in Aristotle's text. I propose to interpret them as the syntactical equivocity, i.e. as the ambiguity of the structure of a sentence. Such an interpretation agrees with Aristotle's intention, as the quotations mentioned above show, and corresponds to all of the examples mentioned by Aristotle. This interpretation also allows us to treat the combination and division in the same way as the rest of the language paralogisms: we can remove them through introducing more precise though simple syntactical formal rules into our language.

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Assumed Interpretation ...). It is a confusion when a general term is used collectively (to refer to the set of individuals) and then distributively (to refer to each and every individual of that set) in the same context.

Example: *Why do white sheep eat more than black ones? Because there are more of them.*

By analogy, the very same situation arises when we use a singular term *de re* and *de dicto* in one context.

Now, it is obvious that such a mistake is just another case of homonymy – one expression is used in two different senses in a single context. So it is not a specific kind of language paralogism, but only a special case of the first one of these paralogisms. Anyway, it has nothing to do with Aristotle's description of combination and division; it explains none of Aristotle's examples. Moreover, this distinction is so subtle that it seems improbable that Aristotle ever dealt with it.

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