Aristotle's Principle of Non-Contradiction

I. Lesson

In the following few lessons, we will be going over some fundamental principles of reasoning, which are sometimes called "laws of thought." Note, however, that these "laws" don't work like the laws of physics. That is, a law of science *describes* events (e.g., Newton's Second Law of Motion says that the net force of any object will be equal to the object's mass times its acceleration); if an event turns out differently than a law of science predicts, then we know the problem is with the law, and not with the universe's objects. By contrast, the laws of thought propose a *standard* for thought; when our actual reasoning practices depart from them, the problem is with our reasoning practices, not the law. (A tentative analogy might be pursued here with societal laws, like "Every car must stop at a red light". When a car runs a red light, we don't say that our law didn't accurately predict this instance, and then discard it. We keep the law: the problem is with the car!). Nevertheless, the principles expressed in these laws of thought are so basic to reasoning that some philosophers have argued that, if one were to deny some or all of them, we couldn't reason at all. These include:

1.) The Principle of Non-Contradiction [**PNC**]
2.) The Principle of the Excluded Middle [**PEM**]
3.) The Principle of Identity [**PI**]

These are considered to be fundamental principles upon which much of philosophical reasoning is based.

This lesson will focus on the Principle of Non-Contradiction, which itself was given in three separate formulations by Aristotle: the **metaphysical formulation**, the **doxastic formulation**, and the **semantic formulation**

- **Metaphysical Formulation**: "It is impossible for the same thing to belong and not to belong at the same time to the same thing in every respect" (Metaphysics IV 3 1005b19-20)

Metaphysics is a field of philosophy, originally referring to those Aristotelian works that "come after physics". Metaphysics deals with general and fundamental questions about the nature of reality beyond just the laws of physics. While the metaphysical form of the principle may seem like a complex and convoluted statement, all that it really says is that something cannot have a property and not have

the same property in the same respect -- where the expression 'in the same respect' specifies the conditions in which that property applies.. This stipulation is necessary insofar as a property might apply under some conditions, *but not others*. For example, the same blizzard wind can be cold for Noah and not cold for Jane, or the same blizzard wind can be cold for Noah now, but not cold for Noah an hour ago. When we specify, however, that the same wind cannot be cold and not cold *for the same person* or *at the same time*, then we see that the wind cannot be cold and not cold for Noah now.

- **Doxastic Formulation**: "it is impossible to hold the same thing to be and not to be" (Metaphysics IV 3 1005b24 cf.1005b29–30)

"Doxastic" means "of or relating to belief or opinion". Accordingly, the second version of the principle can be interpreted in either of two ways:

(i) as a statement about the psychological capabilities of the mind,

or

(ii) as a declaration of what it is rational to believe in general.

While the metaphysical formulation of the Principle of Non-Contradiction purports that it is impossible for objects themselves to hold and not hold the same property under the same conditions, this doxastic formulation concerns whether *we*, as rational thinkers, are ever justified to (or even able to) *believe* that the same object can hold and not hold the same property under the same conditions. More simply, the metaphysical formulation deals with how an object actually is while the doxastic formulation deals with how we can and should understand the object.

Activity: Discuss with a partner which of these two interpretations is more warranted? Can either of you think of reasons to favor one over the other? Why might they both be true, even if Aristotle meant one or the other?)

- **Semantic Formulation**: no two contradictory propositions can be both simultaneously true or simultaneously false.

'Semantics' refers to a field of linguistics (and oftentimes, philosophy as well) that examines the meaning of linguistic units, which is often closely tied to the truth-conditions of that unit. The

Semantic Formulation of the principle refers to the idea that no two contradictory propositions can be true or false at the same time. Take, for instance, the propositions: "New York is a city" and "New York is not a city." According to the Semantic Principle of Non-Contradiction, one of these must be true and the other must be false. It cannot both be the case that New York is a city and that New York is not a city. Likewise, it cannot both be false that New York is a city and that New York is not a city.

The Semantic Formulation differs from the first two formulations insofar as it captures the logical sentiment behind them. The first two formulations state principles about the possibility of *objects* to be X and not-X at the same time or principles about whether a *subject* is ever justified to believe that an object to be X and not-X at the same time. The Semantic Formulation simply reflects these two principles in their application to logic.

Activity: Test the claim that this version of the principle "can be viewed as nothing more than an extension of the first" by trying to think of some examples where the first version is violated but not the third, or vice versa. If you are able to come up with one, share your reasoning with the class.

II. Contradictories and Opposites

To clarify further, let us introduce the distinction between contradictories and opposites. The PNC is concerned with the former. However, it has an ancestor in a famous passage of Plato's *Republic*, which is concerned with opposites.

Principle of Opposites: The same thing will not be willing to do or undergo opposites in the same part of itself, in relation to the same thing, at the same time. (Plato, Republic 436b)

For example, cold and hot, tall and small, odd and even, are opposites.

Contradictories, however, are strictly each other's negation, for example, cold and not-cold, tall and not-tall, and so on. In terms of the semantic version, this can also be formulated as follows: the proposition "X is cold" and "It is not the case that X is cold" are contradictories. Likewise, "X is cold" and "X is not-cold" are contradictories, unless it is further specified that X is cold in some sense, but not another, or that X is cold at some time/place, but not at another.

III. Examples

In this section let's look at some examples for each version of the principle.

Metaphysical:
This version could be shown through the truism that one could not both claim to be cold and not cold in the same way, at the same time:being cold implies not being not cold, and vice versa.
In response, someone perhaps could propose the example of an individual standing in a tub of ice on a hot summer's day, so as to be hot and cold at the same time. While this is true, *it is not* in contrast with the Principle of Non-Contradiction. This is because the person in the example above is not hot and cold in the same way. As their feet are in the ice, this person would never claim their feet to be hot, just as their unsubmerged body would not be cold.
So, although this individual does in fact possess both of the properties at hand, they do not possess them in the same way. A similar example can be provided by an elder who claims to be both young and old.

Activity: Come up with more examples of this version of the principle seemingly failing and explain why these examples do not actually violate the principle. Share these with the whole class, so your teacher can make sure your example and reasoning are suitable.

Doxastic:
This version of the principle can be demonstrated simply, as you can't, for instance, look at a car and think to yourself that it is both beautiful and not-beautiful at the same time and in the same way.

Semantic:
The third version, the semantic version, can be demonstrated by an attempt to assert, as true, that koalas both are and are not marsupials; such a claim is simply illogical.

IV. Exercises:

Exercise 1

Directions: In your own words, list and explain each version of Principle of Non-Contradiction
1.)
2.)
3.)

Exercise 2

Directions: Answer the following questions.
1.) Why does the example of an elder who claims to be both young and old not violate the Principle of Non-Contradiction?
2.) What is the difference between the two versions of the doxastic interpretation?
3.) Why is it fair to say that the semantic version of the principle can be treated as an extension of the metaphysical version?

Exercise 3 (Challenge Question):

Directions: Determine whether or not the following examples break a form of the Principle of Non-Contradiction and explain your reasoning. (Hint: In terms of the doxastic version of the principle, think of the second interpretation from above.)

Ex. Last time I saw my uncle, he was both sad and happy. He was sad because he lost his favorite pair of shoes, but he was happy because he bought a new pair.

Answer: Does not break the Principle of Non-Contradiction, as he is happy and sad about two different things, so he does not possess these contrasting emotions in the same way. Also remember that "sad" and "happy" are opposites, not contradictories.

1.) Last week, I encountered an individual who at the same time believed that the climate crisis is one of the world's most pressing issues and that the fossil fuel industry is perfectly fine as it is.
2.) One day, upon going to a second hand store, my friend and I saw a painting and simultaneously began to comment on it. I claimed that the picture was beautiful, while my friend claimed it was ugly.
3.) Upon encountering a well-known liar, I began to have a conversation with them. Within the conversation, they said the sentence "I'm not lying".

V. Conclusion

In this lesson, we discussed the Principle of Non-Contradiction. We introduced the three different versions of the principle: the metaphysical version, the doxastic version, and the semantic version. Although it was further discussed that the principle is not universally accepted, for the purposes of Aristotelian logic, the Principle of Non-Contradiction is fundamental in philosophy, and understanding it is necessary to avoid making nonsensical claims.

VI. Learning Goals:

- Following this lesson, students should have a thorough understanding of the Principle of Non-Contradiction in all three of its forms.
- Additionally, if the optional reading is completed, students should also know Aristotle's primary argument for the principle as well as some arguments against each of the three versions presented.

Answer Key:

Exercise 1

Answers may vary, however some examples of suitable answers will be presented below.

1. The ontological version states that it is impossible for the same subject(s) to possess opposite properties in the same way at the same time.
2. The doxastic version states that it's impossible to (rationally) belief contradictory propositions simultaneously.
3. The semantic version states that a proposition and its contradiction cannot both be true at the same time.

Exercise 2

1. This doesn't violate the principle, as the elder did not possess the properties at the same time.
2. The psychological interpretation makes a claim about the capabilities of the human mind, while the normative interpretation makes a claim about rationality.
3. This is fair to say, as the true of propositions is reliant upon the state of the actual exterior world.

Exercise 3 (Challenge Question)

1. This does violate the doxastic principle, as the fossil fuel industry has a negative impact on the climate crisis, so it is not rational to believe the former is fine while also believing the latter is a pressing issue, recognition of the pressing nature of the climate crisis implies recognition of the moral failings of the fossil fuel industry.
2. This could be thought to violate the principle depending on whether or not being beautiful/ugly is thought of as a relative property that depends on the speaker. If it is, then the subjective nature of the propositions will make both be simultaneously true, and the ontological Principle of Non-Contradiction will be violated. If the property is thought of as absolute, then one of the propositions will be false, and the principle will not be violated.
3. This does not violate the ontological principle, because the fact that this person is a "well known liar" does not mean that they are lying at this moment; in the same vein this does not mean that they are no longer a "well known liar". This does not violate the semantic version, as the situation described provides no reason to think that the statement is not determinately true or false.