A Neo-Aristotelian Formulation of the Doctrine of the Mean

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In this article, we propose a new formulation of the doctrine of the mean. The classical formulation of this doctrine stems from Aristotle's thought and is primarily outlined in the *Nicomachean Ethics*. The new formulation we present here is based on the conceptual tool of matrices of concepts (Franceschi, 2002).[1] In what follows, we first describe the Aristotelian formulation of the doctrine of the mean. We also outline the fundamental elements governing matrices of concepts. We then present a new formulation of the doctrine of the mean, based on the very structure of matrices of concepts. We also compare this version of the doctrine of the mean with Aristotle's, highlighting the similarities and differences. Finally, we demonstrate how the neo-Aristotelian version of the doctrine of the mean addresses a number of objections, particularly those traditionally raised against its Aristotelian version.

1. Aristotle's doctrine of the mean

In what follows, we will focus on the doctrine of the mean, as it emerges from Aristotle's thought and as it is presented, notably, in the *Nicomachean Ethics*. Aristotle thus considers that a virtue occupies a middle position between two vices, one erring by excess and the other by deficiency. Such a formulation has given rise to numerous interpretations by Aristotle's commentators, and we will have the opportunity to discuss them later.[2] But first, it is necessary to analyze the Aristotelian doctrine of the mean in more detail.

At this stage, it is important to distinguish between the general formulation of the doctrine of the mean and its specific formulation, which refers to particular instances concerning notions such as courage, generosity, or ambition. The general formulation, first of all, of Aristotle's doctrine of the mean, arises notably from the following passage:

> Virtue, then, is a state involving rational choice, consisting in a mean relative to us and determined by reason—the reason, that is, by reference to which the practically wise person

[1] The matrices of concepts were developed by the author independently as a conceptual tool with a trans-disciplinary purpose. It is only recently that he discovered that this conceptual tool bears significant similarities, in the field of ethics, with the Aristotelian doctrine of the mean.
[2] Such interpretations can notably be found in Urmson (1973), Curzer (1996a), Ross (2004), Hurthouse (2006), as well as Fisher (2018).

> would determine it. It is a mean between two vices, one of excess, the other of deficiency. (1106b)

and likewise:

> Of these three dispositions, then, two are vices—one of excess, the other of deficiency—and the third, the mean, is virtue. (1108b)

Each virtue, according to Aristotle, lies midway between two extremes, one characterized by excess and the other by deficiency. Aristotle also illustrates this general definition with a number of examples and mentions several instances of virtues to which it applies. One such instance concerns courage, which Aristotle characterizes in the following manner:

> The same goes, then, for [...] courage [...]: the person who avoids and fears everything, never standing his ground, becomes cowardly, while he who fears nothing, but confronts every danger, becomes rash. (1104a)

and also:

> The coward, the rash person, and the courageous, then, are all concerned with the same things, but are in different states in relation to them; the first two exceed and fall short, while the state of the courageous person is intermediate and right. (1116a)

A second instance, described by Aristotle, concerns the notion of ambition. Aristotle's definition, based on the general trinitary formulation, is as follows:

> The person who exceeds in his desires is described as a lover of honour, the person who is deficient as not caring about it, while the one in between has no name. (1107b)

In the same manner, another instance described by Aristotle concerns the virtue of reserve, to which the trinitary model is also applied:

> Shame, for example, is not a virtue, but praise is also bestowed on the person inclined to feel it. Even in these cases one person is said to be intermediate, and another—the shy person who feels shame at everything—excessive; he who is deficient or is ashamed of nothing at all is called shameless, while the person in the middle is properly disposed to feel shame. (1108a)

Finally, Aristotle mentions the application of the doctrine of the mean to another instance, the virtue of generosity:

> In giving and taking money, the mean is generosity, while the excess and deficiency are wastefulness and stinginess. (1107b)

Thus, the generous person occupies a position that lies midway between the prodigal (who errs by excess) and the stingy (who errs by deficiency).[3]

2. The matrices of concepts

The new formulation of the doctrine of the mean that we propose here is based on the conceptual tool of matrices of concepts (Franceschi, 2002). A specific formulation of the doctrine of the mean arises directly from their inherent structure. Thus, before presenting the new formulation associated with them, we will describe the essential elements of matrices of concepts. This is a conceptual tool with a transdisciplinary purpose, enabling the construction and precise definition of the relationships of a given concept with several of its neighboring concepts.

The matrices of concepts are based on the notion of dual poles. These are *neutral* and opposing concepts, which carry a connotation that is neither positive nor negative. They can therefore be denoted as A^0 and $\bar{A}^0$. We can represent them as follows:

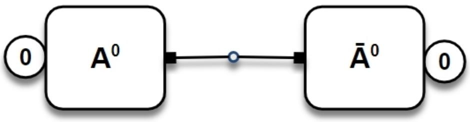

Figure 1. The neutral dual poles A^0 and $\bar{A}^0$

Instances of dual poles are notably formed by the following pairs of concepts: *static/dynamic*, *internal/external*, *qualitative/quantitative*, *abstract/concrete*, *absolute/relative*, *diachronic/synchronic*, *singular/multiple*, *extension/restriction*, *individual/collective*, *analytic/synthetic*, *implicit/explicit*, etc.

From the notion of dual poles, we are able to construct the six concepts that form a matrix of concepts. Each dual pole is thus associated with a positive and a negative concept. The positive and negative concepts associated with the neutral pole A^0 are denoted by A^+ and A^-. Similarly, the positive and negative concepts associated with the neutral pole $\bar{A}^0$ are denoted by $\bar{A}^+$ and $\bar{A}^-$.

At this stage, we are able to construct the complete matrix of concepts, which consists of the six concepts: A^+, A^0, A^-, $\bar{A}^+$, $\bar{A}^0$, $\bar{A}^-$, which we refer to as *canonical poles*. The structure of a matrix of concepts is therefore as follows:

[3] Cf. Fisher (2018, p. 54): '[...] the character of the generous person is, in some sense, 'in between' that of the prodigal person and that of the stingy miser. Prodigal people are excessive, stingy people are deficient, and generous people are neither excessive nor deficient but rather in between.'

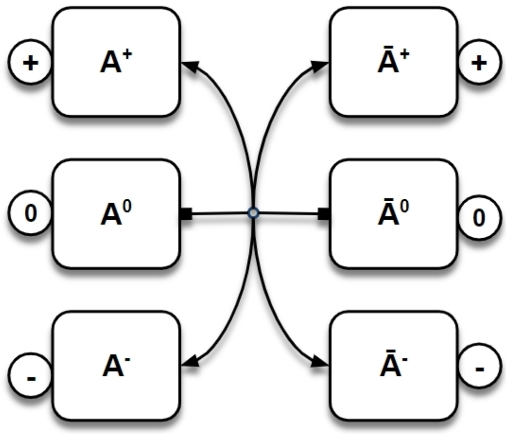

Figure 2. Structure of a matrix of concepts

It consists of two half-matrices: the half-matrix associated with pole A is composed of the three concepts A^+, A^0, and A^-; and likewise, the half-matrix associated with pole $\bar{A}$ comprises the three concepts $\bar{A}^+$, $\bar{A}^0$, and $\bar{A}^-$.

At this stage, we can also mention the main relationships that can be defined between the concepts within the same matrix:

(i) a relation of *duality*, existing between the two neutral dual poles A^0 and $\bar{A}^0$

(ii) a relation of *bipolar opposition* (or of *contrary*), which concerns two non-neutral concepts (i.e., positive or negative) of opposite polarity and belonging to two *different* poles: such a relation of contrary exists, on the one hand, between the concepts A^+ and $\bar{A}^-$, and on the other hand, between the concepts A^- and $\bar{A}^+$

(iii) a relation of *unipolar opposition*, which concerns two non-neutral (i.e., positive or negative) concepts of opposite polarity and belonging to the *same* pole; such a relation applies, on the one hand, to the concepts A^+ and A^-, and on the other hand, to the concepts $\bar{A}^+$ and $\bar{A}^-$

(iv) a relation of *complementarity*, which concerns the two positive concepts A^+ and $\bar{A}^+$

(v) a relation of *extreme opposition*, which applies to the two negative concepts A^- and $\bar{A}^-$

Having provided the general definition of a matrix of concepts, it is appropriate at this stage to describe some instances. We will focus here on cases of matrices of concepts that correspond to the examples of virtues cited by Aristotle, particularly those concerning courage and generosity. First, the following instance of a matrix of concepts applies notably to the concept of courage:

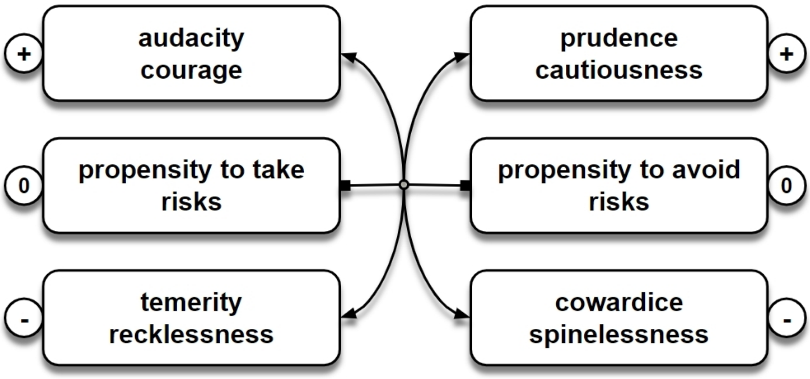

Figure 3. Instance of matrix of concepts related to the notion of courage

This instance includes the positive concepts of courage and prudence, as well as the negative concepts of cowardice and recklessness, along with the neutral concepts of risk-taking propensity and risk-avoidance propensity. Among the different concepts within this instance of the matrices of concepts, we thus have the following relationships:

(i) a *duality* relationship between the two neutral concepts of propensity to take risks and propensity to avoid risks
(ii) a *bipolar opposition* (or *contrary*) relationship between the concepts of courage and cowardice on one hand, and between the concepts of temerity and prudence on the other hand
(iii) a *unipolar opposition* relationship between, on one hand, the concepts of audacity and temerity, and on the other hand, the concepts of prudence and cowardice
(iv) a *complementarity* relationship between the concepts of courage and prudence
(v) an *extreme opposition* relationship between the negative concepts of recklessness and cowardice

Similarly, the following matrix of concepts constitutes an instance that applies particularly to the concept of generosity:

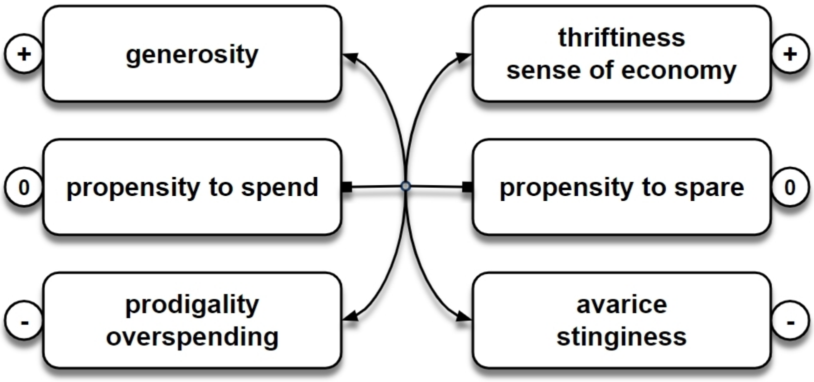

Figure 4.Instance of matrix of concepts related to the notion of generosity

This instance of matrix of concepts mentions the positive concepts of generosity and thriftiness, the negative concepts of prodigality and stinginess, as well as the neutral concepts of propensity to spend and propensity to spare. Among the different concepts in this instance, we also have the following relationships:[4]

- (i) a *duality* relationship between the two neutral concepts of propensity to spend and propensity to spare
- (ii) a *bipolar opposition* (or *contrary*) relationship between the concepts of generosity and avarice on one hand, and between the concepts of prodigality and thriftiness on the other
- (iii) a *unipolar opposition* relationship between, on one hand, the concepts of generosity and prodigality, and on the other hand, the concepts of thriftiness and avarice
- (iv) a *complementarity* relationship between the concepts of generosity and thriftiness
- (v) an *extreme opposition* relationship between the negative concepts of prodigality and avarice

3. New formulation for the doctrine of the mean

[4] The application of matrices of concepts is not limited to concepts related to courage and generosity. They are particularly applicable to the following concepts (listed in order A^+ and $\bar{A}^-$, A^0 and $\bar{A}^0$, A^- and $\bar{A}^+$): firmness & laxity, propensity to sanction & propensity to forgive, inclemency & clemency; objectivity & subjectivity, neutrality & partisanship, impersonality & commitment; frankness & hypocrisy, propensity to act directly & propensity to act indirectly, bluntness & tact; mobility & sedentariness, tendency to move & tendency to stay in place, instability & stability; constructive ambition & self renunciation, ambition & self-forgetfulness, excessive ambition & abnegation; eclecticism & compartmentalization, interdisciplinarity & mono-disciplinarity, superficiality & expertise; capacity for abstraction & prosaicism, interest in the abstract & interest in the concrete, dogmatism & pragmatism; resolution & indecision, holding an opinion & changing one's mind, stubbornness & mental flexibility; optimism & pessimism, tendency to see advantages & tendency to see disadvantages, blind optimism & awareness of problems; incredulity & credulity, propensity to doubt & propensity to believe, excessive mistrust & justified trust.

We are now in a position to propose a new formulation for the doctrine of the mean. We will begin by providing a general formulation, drawing in particular on the relationships mentioned above between the different poles of a matrix of concepts.

> the positive concept A^+ is in a position of fair balance with the two extreme concepts, that is, in a bipolar opposition relationship with the concept $\bar{A}^-$, and in a unipolar opposition relationship with the concept A^-; the concept A^- fails by excess from the perspective of pole A and by deficiency from the perspective of pole Ā

and respectively:

> the positive concept $\bar{A}^+$ is in a position of fair balance with the two extreme concepts, that is, in a bipolar opposition relationship with the concept A^-, and in a unipolar opposition relationship with the concept $\bar{A}^-$; the concept $\bar{A}^-$ fails by excess from the perspective of the Ā pole and by deficiency from the perspective of the A pole

We can also reformulate this principle using the terms employed by Aristotle::

> a virtue occupies a position of fair balance between two vices, opposing one of them in a bipolar manner and the other in a unipolar manner, while each of these vices fails by excess in relation to its own pole and by deficiency with respect to the other pole

If we apply this principle of fair balance to the notion of courage, it results in the following formulation:

> *courage* occupies a position of fair balance, opposing cowardice in a bipolar manner and recklessness in a unipolar manner, while cowardice represents an excess of risk avoidance and a deficiency in risk-taking; similarly, recklessness errs by excess in risk-taking and by deficiency in risk avoidance

And similarly, if we apply this principle to the notion of generosity, the following formulation ensues:

> *generosity* occupies a fair balance position, opposing avarice in a bipolar manner and prodigality in a unipolar manner, while avarice represents an excess in the propensity to spare and a deficiency in the propensity to spend; similarly, prodigality fails by excess in the propensity to spend and by deficiency in the propensity to spare

4. Similarities between the two formulations

At this stage, it is appropriate to compare Aristotle's doctrine of the mean with the formulation that has just been presented. We will thus seek to highlight the similarities and differences. Indeed, both formulations share a number of elements. First, it turns out that both formulations of the doctrine of the mean include a mention of the 'two extremes'. Aristotle refers to this as follows: ‘By the mean in respect of the thing itself I mean that which is equidistant from each of the extremes.’ (1106a) And similarly: ‘(...) for the extreme states are contrary both to the intermediate state and to each other, and the intermediate to the extremes;’ (1108b). In the present construction, in an identical manner, the concepts A- and Ā- are two extreme concepts, of a negative nature, which maintain a relationship with each other that we have defined as an extreme opposition.

Secondly, it is worth mentioning that Aristotle repeatedly mentions that some concepts lack a name, even though the trinitary model (virtue-vice by excess-vice by deficiency) predicts their existence. ‘he who exceeds in fearlessness has no name (many of the states have no name)’ (1107b); similarly: ‘Of those who go to excess he who exceeds in fearlessness has no name (we have said previously that many states of character have no names)’ (1115b). And also: ‘But in this case the extremes seem to be contradictories because the intermediate has not received a name.’ (1125b) In the same way, within the framework of matrices of concepts, some concepts are not lexicalized, as there is no corresponding word in common language to designate them,[5] even though there exists for them a definition corresponding to one of the elements of a given matrix of concepts.[6] Both models thus function as constructors of concepts, some of which may not be lexicalized.

A third common point between the two formulations lies in Aristotle's specific definition of the notion of prodigality, for which he uses a particular definition, which is as follows:

> We have said that wastefulness and stinginess are excesses and deficiencies in two respects: giving and taking (spending we count as giving). Wastefulness exceeds in giving and not taking, and is deficient in taking, while stinginess is deficient in giving, and exceeds in taking, but only in small matters. (1121a)

This *specific* definition does not align with the general formulation of Aristotle's doctrine of the mean, which is based on a triplet of concepts (virtue-vice by excess-vice by deficiency), referred to by David Ross as the ‘trinitary scheme’.[7] However, in this particular definition of prodigality, we unusually find the mention of two concepts, ‘giving and taking,’ which Aristotle uses in the same way as the dual neutral concepts in the present construction. He also mentions the two negative concepts respectively associated with them, namely wastefulness and stinginess. And Aristotle emphasizes in this particular passage that the negative concept of wastefulness fails by excess in relation to giving and by deficiency with regard to taking. He also adds that the

[5] This is likely to vary from one language to another.
[6] Cf. Franceschi (2002, p. 211).
[7] Ross (2006, p. 130).

negative concept of stinginess fails by excess in relation to taking and by deficiency in relation to giving.[8] Thus, it turns out that, regarding this specific definition of prodigality and avarice, the definition given by Aristotle is entirely compatible with the general formulation resulting from the present model. Indeed, it is constructed from the dual neutral poles of ‘giving and taking.’ Surprisingly, to the author's knowledge, commentators on Aristotle have made little mention of this particular characteristic. Even Kant,[9] in his critique of the Aristotelian doctrine of the mean, applying it to the notion of prodigality, adopts Aristotle's general definition based on the triplet of concepts virtue-vice by excess-vice by deficiency. But Howard Curzer, referring to this excerpt, rightly considers that it generates confusion.[10]

5. Differences between the two formulations

At this stage, it is now appropriate to describe the differences between the two formulations. To begin with, Aristotle's general 'trinitary' formulation is based on a *triplet* of concepts: virtue-vice by excess-vice by deficiency. Each virtue thus constitutes a concept that lies midway between the two vices associated with it, one failing by excess and the other by deficiency. In contrast, the present formulation is based on a *sextuplet* of concepts. In this context, each concept is subject to a bipolar definition. More specifically, it follows that each negative concept fails by excess with respect to its own pole and by deficiency in relation to the other pole. Thus, the concept A^- fails by excess in relation to pole A and by deficiency in relation to pole $\bar{A}$. Similarly, the concept $\bar{A}^-$ fails by excess in relation to pole $\bar{A}$ and by deficiency in relation to pole A.

Secondly, it should be pointed out that in Aristotle, the concepts of a neutral nature are not mentioned in the general formulation of the doctrine of the mean, whereas they constitute an essential element of the present construction. Thus, the definition of Aristotle's negative concepts is based on positive concepts, in relation to which they err either by excess or by deficiency. In the present model, by contrast, positive and negative concepts are defined in relation to neutral concepts. And a negative concept fails by excess or by default, not in relation to a positive

[8] A similar definition is provided by Aristotle in the *Eudemian Ethics*: ‘And since the two former characters consist in excess and deficiency, and where there are extremes there is also a mean, and that mean is best, there being a single best for each kind of action, a single thing, it necessarily follows that liberality is a middle state between prodigality and meanness as regards getting and parting with wealth.’ (EE 3.1231b).

[9] Cf. Young (1996, p. 95): ‘In The Metaphysical Principles of Virtue, Kant writes: [...] the much-praised principle (of Aristotle) that places virtue in the mean between two vices is false. For instance, suppose that liberality is given as the mean between two vices, prodigality and illiberality. Then its origin as a virtue can neither be represented as the gradual diminution of the former vice (by saving) nor as the increase of expenditure by illiberals; also these vices cannot be viewed as if, proceeding as it were in opposite directions, they met together in liberality.’

[10] Cf. Curzer (2012, p. 100): ‘The doctrine of the mean says that to each virtue there corresponds a vice of excess and a vice of deficiency. Now Aristotle does not say which of liberality’s two companion vices is the excessive disposition and which the deficiency. Indeed, what Aristotle does say obfuscates the matter.’

concept, but relative to a neutral concept. Consequently, in the present construction, recklessness is not an excess of audacity, but an excessive propensity for risk. The excess here applies to the neutral concept of risk-taking propensity and not to the positive concept of courage.

Thirdly, Aristotle introduces the notion of a continuum existing between a virtue and the two extremes associated with it: 'In everything continuous and divisible, one can take more, less, or an equal amount, and each either in respect of the thing itself or relative to us; and the equal is a sort of mean between excess and deficiency.' (1106a) The very idea of a continuum stems from the Aristotelian definition of the mean, according to which a virtue occupies a position that constitutes a mean between two extreme positions, one corresponding to an excess and the other to a deficiency. In the context of matrices of concepts, the notion of a continuum is also present, but it applies differently. Indeed, two types of continua are likely to emerge:

(i) a continuum between bipolar opposites (or contraries), from A^+ from $\bar{A}^-$ and from $\bar{A}^+$ to A^-
(ii) a continuum between unipolar opposites, from A^+ to A^- and from $\bar{A}^+$ to $\bar{A}^-$

Fourthly, the present formulation differs from that of Aristotle in its definition of contraries. For Aristotle, a virtue stands in a relation of contrary to both extremes associated with it:

> Of these three dispositions, then, two are vices—one of excess, the other of deficiency—and the third, the mean, is virtue. Each is in a way opposed to each of the others, because the extremes are contrary to the mean and to one another, and the mean to the extremes. (1108b)

In the present construction, however, we need to consider not one but two virtues, each corresponding to one of the poles. And each of these virtues opposes the two extremes, but in a different manner. Indeed, each virtue is in bipolar opposition to one of the extremes, which is its contrary, and in unipolar opposition to the other extreme. This is undoubtedly the main difference between the two formulations. For Aristotle considers only one virtue, whether in his primary trinitary model or even in his quinary model.

We can illustrate this with the definition of courage, based on the general trinitary model. Let us therefore consider the definition that Aristotle gives of the virtue of courage:

> The coward, the rash person, and the courageous, then, are all concerned with the same things, but are in different states in relation to them; the first two exceed and fall short, while the state of the courageous person is intermediate and right. (1116a)

He thus mentions three concepts which, in our formulation, correspond to $\bar{A}^-$ (coward), A^- (rash) and A^+ (courageous). According to the general model, the virtue of courage is defined as the contrary of cowardice and temerity. However, it turns out that the concept $\bar{A}^+$ is missing here, although it can be constructed: it is the contrary of temerity, which corresponds to the notion of prudence. Now, prudence is a virtue, which thus corresponds to the following definition: it is the contrary of cowardice and temerity. However, such a definition is also that of the notion of courage. Thus, courage and prudence correspond to the same definition. The same applies to the characterization of liberality based on the quinary model:

> In giving and taking money, the mean is generosity, while the excess and deficiency are wastefulness and stinginess. (1107b)

Aristotle mentions five concepts which, in our formulation correspond to A^0 (giving money), $\bar{A}^0$ (taking money), A^+ (generosity), A^- (prodigality), and $\bar{A}^-$ (stinginess). In this conception, generosity is defined as the contrary of wastefulness and stinginess. However, in this latter construction, the concept $\bar{A}^+$ is missing. Yet, it is possible to construct such a concept, as the contrary of prodigality (A^-) corresponds to the notion of thriftiness ($\bar{A}^+$). Now, thriftiness is a virtue and, according to the Aristotelian model, it results in the following definition: it is the contrary of prodigality (A^-) as well as stinginess ($\bar{A}^-$). However, such a definition is also that of the aforementioned concept of generosity. It follows, therefore, that the intuitively very different concepts of generosity and thriftiness share the same definition. Thus, in general, when Aristotle considers the virtue A^+, he associates the two vices A^- and $\bar{A}^-$ with it, but overlooks the virtue corresponding to $\bar{A}^+$. Although not mentioned by Aristotle, the virtue $\bar{A}^+$ can nonetheless be conceptualized within the ternary or even quinary Aristotelian model. And this is not without consequence. Indeed, the virtue $\bar{A}^+$ can be defined as the contrary of the two vices associated with it, namely A^- and $\bar{A}^-$. However, it turns out that this definition is exactly that of the virtue A^+. We thus have two different virtues, A^+ and $\bar{A}^+$, which share the *same definition*. Now, this has the effect of rendering the model globally inconsistent. Indeed, two concepts that, intuitively, are fundamentally different, correspond to an identical definition. In the present model, such a consequence is avoided, as the definitions of A^+ and $\bar{A}^+$ are different: A^+ is the contrary of $\bar{A}^-$ and the unipolar opposite of A^-, whereas $\bar{A}^+$ is the contrary of A^- and the unipolar opposite of $\bar{A}^-$.

6. Interpretation of the Aristotelian formulation of the doctrine of the mean

The aforementioned elements show that the two formulations share a number of common points, while differences nevertheless distinguish them. However, the preceding analysis also allows us to propose an interpretation of the Aristotelian doctrine of the mean. The core of this interpretation lies in the previously mentioned divergence between (i) Aristotle's general definition of virtues based on the tripartite distinction of virtue-excess vice-deficiency vice, and its application to several virtues such as courage, ambition, or moderation; and (ii) the specific definition of the concept of 'prodigality' and its associated concepts: such a difference lies in the fact that this latter definition of 'prodigality' does not correspond to the general tripartite scheme. It is this divergence that forms the basis of the interpretation proposed here.

Aristotle's trinitary definition of virtues is indeed based on the triplet of concepts: virtue-vice by excess-vice by deficiency. Within this general framework, Aristotle characterizes several of the above-mentioned instances, which pertain to courage, ambition and reserve. These instances fit into the general trinitary scheme, which includes a virtue, a vice by excess and a vice by deficiency. On the other hand, it turns out that the specific definition of prodigality does not rely on this same triplet of concepts but rather on a 5-tuple of concepts. Aristotle mentions (1107b) not only generosity, wastefulness, and stinginess but also the fact of giving or taking money. This definition thus involves five distinct concepts. In any case, this no longer constitutes a trinitary scheme. Morevoer, such a definition is not purely accidental, as the definition of prodigality proposed in the *Nicomachean Ethics* is also reiterated in the *Eudemian Ethics*. In fact, Aristotle there refers to an identical construction of five concepts:

> And since the two former characters consist in excess and deficiency, and where there are extremes there is also a mean, and that mean is best, there being a single best for each kind of action, a single thing, it necessarily follows that liberality is a middle state between prodigality and meanness as regards getting and parting with wealth. (EE 3.1231b)

Such a discrepancy is crucial, it seems to us, and it is now appropriate to analyze its consequences. We first observe that, since Aristotle's definition of virtues is presented in the form of a constructor of concepts, it turns out that the general formulation only allows for the construction of three concepts, whereas the specific definition of prodigality allows for the construction of five concepts. Thus, the taxonomy of concepts associated with the definition of prodigality involves a greater number of concepts than the triplets of concepts associated with the notions of courage, ambition or reserve, constructed from the general definition. This leads us to consider that the quinary constructor of concepts associated with the definition of prodigality is more elaborate, more evolved than the trinitary constructor applied to instances of courage, reserve and ambition.

Secondly, the question arises as to whether the concomitant use of the general constructor based on the triplet of concepts and the one based on a 5-tuple of concepts applied to prodigality leads to a contradiction, which would then render the entire Aristotelian doctrine of the mean inconsistent. However, analysis reveals that this is not the case, as it turns out, as we will illustrate, that the two constructors are largely compatible. Take, for example, the notion of courage. The trinitary definition leads to the construction of the concepts of courage, lack of courage (cowardice), and excess of courage (temerity). If we apply a model based on the 5-tuple of prodigality, this results in the following construction, paraphrasing Aristotle: between risk-taking and risk-avoidance, the mean is courage, while the excess and deficiency are temerity and cowardice. Ultimately, we see that the constructor based on the 5-tuple predicts the existence of the same concepts as the trinitary constructor, to which it adds two additional concepts (risk-taking and risk-avoidance) that, in our construction, correspond to neutral concepts. And what applies to courage can also be generalized to other virtues such as ambition or reserve. For the general trinitary formulation allows for the construction of the concepts A^+, A^- and $\bar{A}^-$, while the quinary formulation allows for the construction of A^+, A^-, $\bar{A}^-$, A^0 and $\bar{A}^0$. This leads to the conclusion that the two types of definition—trinitary and quinary—prove to be entirely compatible.

The preceding elements now allow us to formulate an interpretation of the Aristotelian doctrine of the mean. It thus seems to us that the general formulation of the doctrine of the mean, based on a trinitary definition, represents a preliminary and incomplete step in the ongoing development of Aristotle's final theory of the doctrine of the mean. A more refined formulation of this theory can be found in Aristotle's definition of prodigality, which is based on a quinary framework.

We also suggest that the fact that the quinary formulation of prodigality is not generalized to other virtues is due to the fact that many concepts were not lexicalized during Aristotle's time, making this latter formulation less evident. Such a discrepancy can also be explained by the absence of many concepts in common language, an observation that Aristotle makes on several occasions[11]. Indeed, we find such a reference to the absence of lexicalization of certain concepts in the definition of courage[12], the pursuit of pleasure[13], obsequiousness[14] and boastfulness[15].

7. Response to criticism

In the foregoing, we have reached the conclusion that the ternary formulation of the Aristotelian doctrine of the mean and the quinary formulation of prodigality are entirely compatible. Consequently, and in the same manner, the present formulation based on matrices of concepts, which is a constructor of a sextuplet of concepts, is also compatible not only with the trinitary formulation but also with the quinary formulation applied to prodigality. For the senary constructor of the matrices of concepts proceeds in the same way as the quinary formulation applied to prodigality, to which it adds a sixth concept, corresponding to the concept $\bar{A}^{+}$. Therefore, the present senary formulation based on matrices of concepts proves to be compatible with the entirety of Aristotle's formulation, which it complements by constructing an additional concept. All these elements justify, in our view, that the present formulation claims to be 'neo-Aristotelian.'

At this stage, and in light of the elements that have just been presented, it remains for us to show how the doctrine of the mean, in its neo-Aristotelian formulation, provides a response to

[11] '(…) so that we can better see that in all things the mean is praiseworthy, while the extremes are neither praiseworthy nor correct, but blameworthy. Most of them again have no names, but, for the sake of clarity and intelligibility, we must try, as in the other cases, to produce names ourselves.' (1108a)

[12] 'In fear and confidence, courage is the mean. Of those who exceed it, the person who exceeds in fearlessness has no name (many cases lack names), while the one who exceeds in confidence is rash.' (1107b)

[13] 'People who are deficient in relation to pleasures and enjoy them less than they ought are not generally found, since such insensibility is not a human characteristic. (...) And because he is found so rarely, this sort of person has not been given a name.' (1119a)

[14] 'In the case of the type who makes others happy, the person who is pleasant with no ulterior motive is obsequious, while he who is so with a view to benefiting himself with money or what it buys is a flatterer. We have already said that the person who objects to everything is bad-tempered and belligerent. The extremes seem to be directly opposed to one another because the mean has no name.' (1127a)

[15] 'The mean between boastfulness and its contrary is concerned with almost the same things; and it too does not have a name.' (1127a)

the criticisms traditionally directed at Aristotle's doctrine of the mean.

A first criticism was put forward by David Ross, who rejects Aristotle's definition of contraries. Ross points out that each virtue has only one contrary, not two, as Aristotle mentions:[16] ‘it is unnatural to oppose courage to rashness as well as to cowardice. The opposite of courage is cowardice’. More generally, he adds: ‘generally, we might say, the trinitarian scheme of virtues and vices is mistaken; each virtue has but one opposite vice; the opposite of temperance is intemperance, that of liberality meanness, that of proper pride lack of self-respect, that of good temper bad temper, that of justice injustice.’ In the present context, however, such an objection does not apply, as we are led to distinguish two different types of opposition: the relation of *contrary* (or *bipolar opposition*), and *unipolar opposition*. In this way, each virtue A^+ finds itself in a *contrary* relation with the concept $\bar{A}^-$, and in *unipolar opposition* with the concept A^-. Similarly, each virtue $\bar{A}^+$ is in a *contrary* relationship with the concept A^-, and in a *unipolar opposition* with the concept $\bar{A}^-$. Therefore, in this construction, every virtue has only one contrary, as Ross rightly demands. Thus, courage is the sole contrary of cowardice, just as avarice is the sole contrary of generosity.

A second criticism, raised by several authors, lies in the very definition of the notion of the 'mean' between two extremes, which corresponds to Aristotle's general definition of virtue and has been criticized for its imprecision. This criticism is notably expressed by William Hardie: ‘There may be much that is unsatisfactory and unclear in Aristotle's doctrine that virtue lies in a mean.’[17] We also find mention of such criticism in Welton & Polansky: ‘the notion of the mean, vital to [Aristotle’s] general account of excellence of character and his particular treatments of each of the excellences, and therefore crucial to the success of the ethics, has seemed problematic and even vacuous.’[18] Likewise, Michael Woods emphasizes the notion of the ‘mean,’ which is sometimes defined by Aristotle as a quasi-mathematical concept, while elsewhere it is used as a vague notion: ‘The contrast seems to be that between the midpoint on some scale, which is a matter of calculation and can therefore be ascertained in abstraction from particular circumstances, considering solely the scale itself, and the rather vague notion of what is intermediate between excess and defect, which clearly may depend on a host of variable factors, and is not open to mathematical calculation.’[19] As mentioned earlier, in the neo-Aristotelian version of the doctrine of the mean, we must consider not one but two virtues, corresponding to each of the poles. The conception of virtues is therefore fundamentally bipolar. And each of these virtues opposes the two extremes, but in different ways. Consequently, each virtue is well-defined in relation to the two vices associated with it, but each virtue positions itself more as a point of differentiation or a point of equilibrium relative to the two corresponding vices. It is not a question here of a median, a middle term, or a mean, but rather of a position of equilibrium[20]

[16] Ross (2004, p. 130).

[17] Hardie (1964, p. 186).

[18] Welton & Polansky (1995, p.79).

[19] Woods (1993, p. 102-103).

[20] This perspective is also shared by Sarah Broadie (1991, p. 101), who emphasizes that ‘within the framework of Aristotle's ethical theory there certainly exists a figure whose proper function it is to aim at the balanced temperament,’, and by Paula Gottlieb (2009, p. 26) who states: ‘Aristotle’s doctrine of the

that results from a relationship of opposition of a unipolar nature with one vice and a bipolar nature with the other vice. Thus, we find the Aristotelian relationship between virtue and the two associated vices, but without the need to resort to a notion of a mean, average, or median.

At this stage, it is also appropriate to consider a third critique, raised by Rosalind Hursthouse, which challenges the notion that there are exactly two vices associated with each virtue. Hursthouse questions the rationale behind such a quasi-mathematical rule:[21] 'But that to each virtue there should correspond precisely two vices, neither more nor less—what kind of explanation could there be of this extraordinary mathematical symmetry? What could there be about our lives and the way we conduct them, about our feelings and our dispositions to have those feelings, that necessitated such a symmetry?' In the present context, we are able to provide an explanation. For the neo-Aristotelian senary model (like the Aristotelian trinary or quinary model) is a constructor of concepts. Starting from a concept borrowed from everyday language, we are able to construct 6 concepts, whether or not these are lexicalized. What determines the existence of two vices is the fundamentally bipolar nature of the model. For every pair of vice$_1$-vice$_2$ is determined by a pair of dual concepts, such as the propensity to give/receive, to engage/avoid risks, to act directly/indirectly, to consider advantages/disadvantages, to focus on the abstract/concrete, and so on. Consequently, it is pairs of concepts such as give/receive, engage/avoid risks, direct/indirect, advantage/disadvantage, abstract/concrete, etc., that form the core component of neutral concepts, thereby establishing a bipolar structure and, consequently, a number of vices equal to two.

We will also examine a fourth critique, also formulated by Rosalind Hursthouse, in the form of the 'fearless phobic' argument.[22] Hursthouse asks us to imagine a person who fears 'the dark, enclosed spaces and mice,' but who nonetheless does not fear 'death, pain or physical damage.' Such a disposition in a person does not seem unrealistic and is indeed likely to occur as a real-life situation, which fully legitimizes Hursthouse's objection. She argues that cowardice does not result from an excess or deficiency, as Aristotle defines it, but from fear directed towards the right or wrong objects. According to Hursthouse, fear of the right objects ('death, pain or physical damage') does not characterize cowardice, whereas the same fear, applied to the wrong objects ('the dark, enclosed spaces and mice' for example), is characteristic of cowardice. Our response to this type of objection is as follows: the concept of courage in its neo-Aristotelian formulation is entirely applicable to the fear of darkness, confined spaces, or mice, just as it is to the fear of death or injury. Thus, the tendency to take risks in the face of mice aligns with the neutral concept A^0; similarly, the tendency to avoid risks in the presence of mice represents the other neutral concept $\bar{A}^0$; in the same way, we have the notion of courage regarding mice, temerity towards mice, prudence concerning mice, and finally cowardice in the face of mice. Similarly, the propensity to take the risk of injury aligns with the neutral concept A^0; and likewise, the tendency to avoid the risk of injury aligns with the other neutral concept $\bar{A}^0$; concerning the risk of injury, we also have the notions of courage, temerity, prudence and finally cowardice. As we can see, this response involves varying the object of risk-taking or risk-

mean includes an account of equilibrium, not of moderation.'

[21] Hursthouse (1980, p. 60).

[22] Hursthouse (1980, p. 67).

avoidance, adapting the scope of the corresponding sextuplet of concepts, and the notion of courage or cowardice is accordingly modified. The fearless phobic can be courageous when it comes to death or serious injury, but cowardly in the face of a mouse. This type of response is entirely consistent with the answer given by Howard Curzer[23] to the 'fearless phobic' argument, who considers that Aristotle 'is only committed to the weaker thesis that (...) if a person goes wrong with respect to some parameter then he or she goes to excess or defect with respect to some parameter. It need not be the same parameter. For example, one sort of deficient fear is fearing only some of the right objects and no other objects, and this sort of fear is being deficient with respect to the object parameter.'

Finally, it is appropriate to consider an objection that may be raised against the current formulation of the doctrine of the mean and to provide a response to it. Such an objection is as follows: (1) if one considers a person who is courageous, that person is therefore not reckless; (2) and consequently, that person does not take thoughtless risks; (3) in this case, that person therefore avoids risks judiciously, and (4) it follows that such a person is prudent. Thus, the one who is courageous is prudent. In the same way, if one considers the one who is prudent, through symmetrical reasoning, that person is therefore also courageous. Thus, one can conclude that 'courageous' and 'prudent' are one and the same concept, which is ultimately inconsistent.

Such an objection, formulated in this way, leads to the response that the same person can be courageous at one moment and reckless at another (in the same way that the 'fearless phobic' can sometimes be fearful and sometimes courageous). It thus follows that (1) is false. However, it turns out that 'courageous,' like 'prudent,' can apply to a person but is also likely to apply to a given act. Therefore, it is possible to reformulate the previous objection by reasoning this time in relation to an act rather than a person. This results in a stronger version of the objection, which is as follows: (1) a courageous act is not a reckless act; (2) therefore, it is an act that does not take inconsiderate risks; (3) thus, it is an act that avoids risks wisely and, consequently, is a prudent act; (4) a courageous act is therefore a prudent act. In this case, the response resulting from the present construction is as follows: first, a courageous act (A^+) is neither a reckless act (A^-), nor a prudent act ($\bar{A}^+$), nor a timid act ($\bar{A}^-$). Thus, (1) is revealed here to be incomplete, as it only mentions that a courageous act is not a reckless act. Secondly, an act that does not take inconsiderate risks, i.e., a non-reckless act, is not limited to a prudent act ($\bar{A}^+$), but also includes a courageous act (A^+) and a fearful act ($\bar{A}^-$). And in this case, it is a courageous act (A^+). Thus, (3) is also revealed to be false. To clarify, we can consider an instance of such a general case, corresponding to an example involving risky situations in the field of financial investment. Consider a situation where four options are possible: a small investment in a company with moderate risk (appropriate risk-taking, A^+), a large investment in a company with high risk (inappropriate risk-taking, A^-), a small investment in a guaranteed fund (appropriate risk avoidance, $\bar{A}^+$), and finally, no investment (inappropriate risk avoidance, $\bar{A}^-$). In this context, it can be verified that the person who chooses to make a small investment in a company with moderate risk (A^+) makes a specific choice that is distinct and cannot be equated with any of the other three options.

[23] Curzer (1996b, p. 8).

In light of the above, it seems to us that in its neo-Aristotelian version, the doctrine of the mean is no longer vulnerable to many of the criticisms that have been classically directed at the Aristotelian version. For the Aristotelian doctrine of the mean has been subject to criticism, sometimes severe, sometimes more nuanced. Although subjected to critiques aimed at testing it, the Aristotelian version of the doctrine of the mean has always found its defenders, who have been able to set aside non-essential elements to highlight the fundamental aspects of profound philosophical interest. The present analysis is situated within such a context, with the aim of retaining only the most advanced elements of a doctrine that can be assumed to be in development at that time, while disregarding the less refined elements. In this perspective, we hope to have done justice to Aristotle by employing this technique, which is suitable for very ancient material, consisting of separating the gems from the rubble.

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