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ORIGINAL RESEARCH

In defense of Aristotelian universals

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Abstract
To be an Aristotelian about universals is to hold that universals depend for their existence on their exemplifiers. An argument against Aristotelianism about universals has recently been put forward by Costa to the effect that a contradiction follows from assuming a certain formulation of Aristotelianism together with some highly plausible principles governing the notions employed in that formulation. In this paper, we provide different ways of articulating the Aristotelian position which, while being related with some of the main contributions in the current Aristotelian tradition, do not fall prey to the argument.

Keywords Universals · Grounding · Ontological Dependence · Essence · Aristotelianism

1 Aristotelianism about universals

To be an Aristotelian about universals is to hold that universals depend for their existence on their exemplifiers. The precise formulation of a consistent Aristotelian view of universals, however, is not an easy task, primarily due to the fact that the notion of ontological dependence involved in this view is far from being transparent. In a recent paper, Costa has put forward an argument against Aristotelianism about universals by relying on one precise formulation of the Aristotelian thesis, according to which the existence of a universal is grounded in its being exemplified by something (Costa 2019). The argument, which has the merit of presenting a first precise formal formulation of the Aristotelian thesis, shows that this version of Aristotelianism about universals, together with some plausible principles about relations, exemplification

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and grounding, leads to contradiction. The aim of this paper is both to assess Costa's argument, by exploring how it can be resisted, and to shed light on some problems that arise in characterizing the notion of ontological dependence in terms of grounding. The paper is structured as follows. In the next section, we provide a reconstruction of the argument. In Sect. 3, granting the assumption that the notion of ontological dependence can be characterized in terms of grounding, we show that there are different and definitely promising formulations of Aristotelianism about universals which are immune from the charge presented by Costa. In Sect. 4 we advance the idea that there is a tension between the polyhedric notion of ontological dependence and the notion of grounding, and we articulate a version of Aristotelianism about universals in terms of different kinds of dependence which again is immune from Costa's argument. Finally, in Sect. 5, we put into question two of the basic principles Costa's argument is based on.

2 The argument against Aristotelianism

In what follows we use "$\lhd$" to denote the one to many relation of being at least partially grounded in, assuming that this relation links facts (see Correia 2020 for a general introduction to the notion of grounding), and "$[\phi]$" to denote the fact corresponding to the proposition that ϕ (hence, "[Fido is white]" will refer to the fact that Fido is white). Furthermore, we use "$\mathcal{E}$" to denote the relation of exemplification, "$\mathbb{U}$" as a first order variable for a universal, "U" as a predicate corresponding to $\mathbb{U}$, and uu as a plural variable referring to the entities that are U.[1] Thus, if s is Fido and $\mathbb{U}$ is whiteness, then U is the predicate of being white, the uu are the white entities, $[U(s)]$ is the fact that Fido is white, and $[\mathcal{E}(s, \mathbb{U})]$ is the fact that Fido exemplifies whiteness.

2.1 Premises

The argument proposed by Costa (2019) fires against a version of Aristotelianism about universals which can be formulated as follows:

AR $[\mathbb{U}$ exists$] \lhd [\exists x \mathcal{E}(x, \mathbb{U})]$
The fact that a universal exists is grounded in the fact that there is something which exemplifies that universal.

Costa argues that this metaphysical doctrine leads to contradictory consequences, just provided that some plausible principles are assumed, governing relations in general and the relations of exemplification and grounding in particular.

The first of these principles develops the idea that the existence of the *relata* is prior to any instance of a relation linking them, and is therefore called *relata-first principle*.

RF $[R(x, y)] \lhd [x$ exists$], [y$ exists$]$
The fact that x and y stand in the relation R to each other is grounded in the fact that x exists and the fact that y exists.

[1] The fact that universals are referred to by first order variables reflects the Aristotelian ontological commitment to the existence of such entities.

The second principle involved in the argument expresses the intuition that generic existential facts are grounded in their particular instances, and is therefore called *instances-first principle*.

IF $[\exists x, y R(x, y)] \lhd [R(a, b)]$, if $R(a, b)$
The fact that there are some things standing in the relation R to each other is grounded in the fact that a and b stand in the relation R to each other, where a and b are particular entities such that $R(a, b)$.

The last two principles involved in the formulation of Costa's argument are the transitivity and irreflexivity principles normally assumed to govern the relation of partial grounding.

GT $[\phi_1] \lhd [\psi] \wedge [\psi] \lhd [\phi_2] \Rightarrow [\phi_1] \lhd [\phi_2]$
If the fact that ϕ_1 is grounded in the fact that ψ, which is grounded in the fact that ϕ_2, then the fact that ϕ_1 is grounded in the fact that ϕ_2.

GI $[\phi] \not\lhd [\phi]$
The fact that ϕ is not grounded in the fact that ϕ.

2.2 Argument

Costa advances the following *reductio* of Aristotelianism about universals.

(1) $[\mathbb{U}$ exists$] \lhd [\exists x \mathcal{E}(x, \mathbb{U})]$
The fact that a universal $\mathbb{U}$ exists is grounded in the fact that there is something which exemplifies $\mathbb{U}$.

(2) $[\exists x \mathcal{E}(x, \mathbb{U})] \lhd [\mathcal{E}(s, \mathbb{U})]$
The fact that there is something which exemplifies $\mathbb{U}$ is grounded in the fact that a particular thing exemplifies $\mathbb{U}$, abiding the instances-first principle.

(3) $[\mathcal{E}(s, \mathbb{U})] \lhd [\mathbb{U}$ exists$]$
The fact that some particular thing exemplifies $\mathbb{U}$ is grounded in the fact that $\mathbb{U}$ exists, abiding the relata-first principle.

(4) $[\mathbb{U}$ exists$] \lhd [\mathbb{U}$ exists$]$ But then, by the transitivity of grounding, the fact that $\mathbb{U}$ exists is grounded in the fact that $\mathbb{U}$ exists.

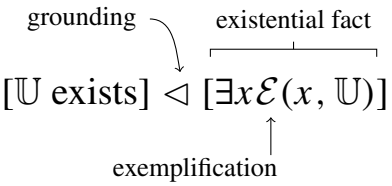
(5) $[\mathbb{U}$ exists$] \not\lhd [\mathbb{U}$ exists$]$
But, by the irreflexivity of grounding, the fact that $\mathbb{U}$ exists is not grounded in the fact that $\mathbb{U}$ exists.

(6) contradiction.

The argument is evidently valid. Therefore, it does reduce *ad absurdum* Aristotelianism about universals, or better it does reduce *ad absurdum* the *particular version* of Aristotelianism about universals assumed by Costa, provided all its premises are true. However, the Aristotelian thesis about universals can be formulated in different non-equivalent ways.

3 Three ways of being Aristotelian

In this section, we provide three ways of resisting the previous argument. As shown above, the argument is based on a construal of the Aristotelian view which rests on a conceptual framework involving a relation of grounding between facts, a notion of existential fact, and a relation of exemplification between objects and universals.[2]



What we are going to show is that slight changes in the conceptual framework are sufficient for getting viable formulations of the Aristotelian thesis.[3]

3.1 Working without exemplification I

A first form of Aristotelianism that avoids Costa's objection relies on the idea that there is no relation of exemplification between a particular thing that is U and the universal $\mathbb{U}$ itself.

Here is a formal regimentation of the proposal:

AR1 $[\mathbb{U}\ \text{exists}] \lhd [\exists x U(x)]$
The fact that a universal $\mathbb{U}$ exists is grounded in the fact that there is something which is U.

AR1 is a genuine version of Aristotelianism about universals, making justice to the intuition that a universal depends for its existence on its exemplifiers: it is because there is something which is U that $\mathbb{U}$ exists, and therefore the existence of the universal is grounded in the existence of something which counts as an exemplifier of that universal, where the notion of being an exemplifier of $\mathbb{U}$ is defined, without introducing exemplification, as follows[4]:

x is an exemplifier of $\mathbb{U}$ iff $U(x)$

AR1 is also a principled way to avoid Costa's objection. On the one hand, **AR1** is invulnerable to the objection: if we try and reproduce Costa's argument, we find that

[2] By an existential fact, we intend a fact corresponding to a proposition expressed by a sentence starting with an existential quantifier. The reason why [$\mathbb{U}$ exists] is not referred to as an existential fact is that we want to stay neutral as to the way in which "$\mathbb{U}$ exists" is to be interpreted. In more detail, we allow for the possibility of interpreting "$\mathbb{U}$ exists" in terms of a first order predicate of existence which is distinguished from the predicate of existence definable via $\exists$, e.g. a predicate of concrete existence (Williamson 2013, ch. 1).

[3] Importantly, we are not claiming that the following versions of the thesis constitute a complete account of the Aristotelian idea. We only claim that they are suitable starting points for advancing such accounts, being not subject to Costa's attack.

[4] A similar definition can be introduced with respect to N-place universals: $x_1, \ldots, x_N$ are exemplifiers of an N-place universal $\mathbb{R}$ iff $x_1, \ldots, x_N$ and $\mathbb{R}$ are the constituents of a given state of affairs.

there is no principle similar to *RF* that can be invoked in this context, since there is no relation of exemplification to which *RF* can be applied. On the other hand, the idea that there is no relation of exemplification is well explored in metaphysics, since avoiding the introduction of a relation of exemplification is actually needed if we want to prevent an infinite regress of exemplifiers.[5]

One could try to fire back on **AR1**, re-establishing Costa's argument, by insisting that a principle is to be assumed to the effect that the fact that something is U is grounded in the fact that $\mathbb{U}$ exists, for any universal $\mathbb{U}$. Indeed, in Costa (2019), Costa proposes this backfiring by claiming that an Aristotelian must still believe (i) that the existence of a universal like redness is grounded in facts involving both the universal and the objects that are red and (ii) that those facts are grounded in the existence of the red objects and in the existence of the universal redness, as long as facts owe their existence to their constituents.

The argument could then run as follows, where Costa's point (ii) is captured by premnise (3):

(1) $[\mathbb{U}\text{ exists}] \lhd [\exists x U(x)]$
The fact that a universal $\mathbb{U}$ exists is grounded in the fact that there is something which is U.

(2) $[\exists x U(x)] \lhd [U(s)]$
The fact that there is something which is U is grounded in the fact that a particular thing is U, abiding the instances-first principle.

(3) $[U(s)] \lhd [\mathbb{U}\text{ exists}]$
The fact that some particular thing is U is grounded in the fact that $\mathbb{U}$ exists, according to the new principle introduced above.

(4) $[\mathbb{U}\text{ exists}] \lhd [\mathbb{U}\text{ exists}]$
But then, by the transitivity of grounding, the fact that $\mathbb{U}$ exists is grounded in the fact that $\mathbb{U}$ exists.

(5) $[\mathbb{U}\text{ exists}] \not\lhd [\mathbb{U}\text{ exists}]$
But, by the irreflexivity of grounding, the fact that $\mathbb{U}$ exists is not grounded in the fact that $\mathbb{U}$ exists.

(6) contradiction.

What can be said in defense of **AR1** is that nothing prevents an Aristotelian to dismiss a principle like $[U(s)] \lhd [\mathbb{U}\text{ exists}]$, since it is possible to assume **AR1** in a framework in which facts are ontologically independent entities, not depending for their existence upon their constituents.[6]

[5] This can be done by different strategies. See, for instance: Russell (1903, par. 99), where the notion of relating relation is introduced; Armstrong (1989, p. 109), where exemplification is viewed as a non-relational fundamental tie; Armstrong (1997, p. 118), where exemplification is viewed as composition between inter-dependent constituents; Lowe (2006, p. 30), where exemplification is viewed as the composition of internal relations; Armstrong (2010, p. 27), where states of affairs are assumed as primitive entities.

[6] In fact, Costa offers no support in favor of such a principle: he only refers to Textor (2021), but no argument, let alone a decisive one, can be found there to the effect that facts owe their existence to their constituents.

An ideal background for this version of Aristotelianism is a metaphysical framework in which facts are the *fundamental entities*, while both particulars and universals depend for their existence on the existence of facts. In this spirit, in Armstrong (2010, p. 27) states

> What must first be done, I think, to deal with this problem is to take states of affairs as the fundamental structures in reality. They are primary, particulars and universals secondary. I mean by this that states of affairs are the least thing that can have independent existence. Unpropertied particulars and uninstantiated universals are false abstractions, meaning that they are incapable of independent existence.

Hence, the fact that x is U will not depend for its existence upon $\mathbb{U}$, nor, then, will be grounded in the fact that $\mathbb{U}$ exists, for any x and any $\mathbb{U}$. It seems therefore that we are left with a perfectly sound version of Aristotelianism about universals which is not vulnerable to the threat posited by Costa's objection.

3.2 Working without exemplification II

A second way to articulate Aristotelianism about universals is to say that the existence of a universal is grounded not in the fact that something exemplifies that universal, but rather in the existence of the universal's particular instances, i.e., its exemplifiers, whatever these are.

The idea is to modify, slightly but crucially, the version of Aristotelianism attacked by Costa while maintaining that Aristotelianism about universals is concerned with grounding the existence of universals. This can be done by claiming that a universal exists because its instances exist, rather than claiming that a universal exists because there is something which exemplifies it. In the former case, unlike in the latter, no appeal is made to a relation of exemplification, nor any existentially quantified fact concerning a universal's exemplifier is invoked.[7]

To appreciate the point, consider this: claiming that a set exists because its members exist is different from claiming that a set exists because there is something which is a member of that set. In the former case, reference is made to specific entities satisfying a certain condition (members, with respect to a set; exemplifiers, with respect to a universal), and the existence of those specific entities is assumed as a ground for the existence of another entity (the set; the universal). In the latter case, instead, it is the existentially quantified fact that there is something satisfying a certain condition (being member of a set; being exemplifier of a universal) which is assumed as a ground for the existence of another entity (the set; the universal), and no reference is made to any specific entity.

Here is a formal regimentation of the proposal:

AR2 $[\mathbb{U}$ exists$] \lhd [uu$ exist$]$

[7] As an existential quantifier binds a variable which ranges over a domain of entities satisfying a certain condition, it is reasonable to assume that no particular entity satisfying a certain condition figures as a constituent in such an existentially quantified fact.

The fact that a universal $\mathbb{U}$ exists is grounded in the fact that a certain plurality uu of entities exist.

AR2 is again a genuine version of Aristotelianism, since the intuition that a universal depends for its existence on its exemplifiers is evidently captured, albeit without invoking exemplification: in fact, **AR2** is almost a literal endorsement of that idea. However, since no exemplification relation is introduced, and since the ground for a universal's existence is taken to be the fact that the universal's exemplifiers exist, i.e., [uu exist], rather than the fact that there is something exemplifying the universal, i.e., [$\exists x \mathcal{E}(x, \mathbb{U})$], principles like *RF* or *IF* are not applicable, and there is no way for the initial argument to go through. We are then left with a second version of Aristotelianism about universals which is not vulnerable to Costa's argument. In addition, this version is consistent with the assumption of a principle—like the one discussed in the previous section—stating that the fact that something is U is grounded in the fact that $\mathbb{U}$ exists. To be sure, no contradiction arises from assuming that both [$U(s)$] $\lhd$ [$\mathbb{U}$ exists] and [$\mathbb{U}$ exists] $\lhd$ [uu exist]: we get that [$U(s)$] $\lhd$ [uu exist], by the transitivity of grounding, but this is as it should be in an Aristotelian framework. In this respect, the present version is a significant improvement of the previous one.[8]

3.3 Working with essences

A final way to articulate Aristotelianism about universals is to spell out the intuition that a universal depends for its existence upon its exemplifiers by endorsing the claim that it is essential for a universal to be exemplified by something.

The central idea here is that entities of different categories have essences, and this idea is developed by introducing, for any entity with an essence, a set of facts that are essential to that entity or, correspondingly, a set of propositions that are true in virtue of the essence of that entity.[9] As an example, a philosopher believing that men and women are essentially human beings will say that it is essential to any particular man or woman that he or she is a human being, or that the fact (respectively, the proposition) that that man or woman is a human being obtains (respectively, is true) in virtue of that man or woman's essence. Now, it may be upheld, in accordance with the Aristotelian conception, that not only particulars, but also universals have essences, since essences are expressed in definitions and universals are, typically, definable. Furthermore, it can be maintained that it is essential for a universal to be exemplified by something, i.e. that the fact that a universal is exemplified by something obtains in virtue of the very essence of that universal, or yet that the proposition that universal $\mathbb{U}$ is exemplified by something is true in virtue of the very essence of $\mathbb{U}$. This way of formulating Aristotelianism about universals can be regimented by introducing a modality $\Box_x$ meaning: it is the case in virtue of the essence of x that (or, equivalently: it is essential to x that).[10]

[8] We are grateful to an anonymous referee for drawing our attention to this important point.

[9] See Fine (1994, 1995), Correia (2005, 2011) for comprehensive introductions and discussions. In particular, see Fine (1994) for a presentation of the motivation leading to the development of the notion of truth by essence and the connection with the Aristotelian tradition.

[10] Here we take these formulations to be equivalent. For further discussion see Correia (2011).

AR3 $\Box_{\mathbb{U}}\exists x\mathcal{E}(x,\mathbb{U})$
It is essential to a universal that there is something which exemplifies it.

AR3 is a genuine version of Aristotelianism about universals. Indeed, two notions of ontological dependence can be formulated in terms of $\Box_x$ by positing that[11]

1. x is rigidly ontologically dependent on y iff $\Box_x(y \text{ exists})$
2. x is non-rigidly ontologically dependent on U iff $\Box_x\exists yU(y)$

In general, if it is essential to x that ϕ, then the existence of x depends on it being the case that ϕ, at least in the sense that x cannot exist without it being the case that ϕ. Therefore, assuming that 2 is a sound characterization of the notion of non-rigid ontological dependence, it follows from **AR3** that a universal non-rigidly depends for its existence on its being exemplified, which is a version of the Aristotelian thesis.[12] Indeed, if the fact that a universal is exemplified depends on the existence of its exemplifiers, then we obtain that a universal non-rigidly depends for its existence on the existence of its exemplifiers, based on the transitivity of the relation of ontological dependence which, in this case, seems to be completely unproblematic.

Yet, **AR3** is not vulnerable to Costa's objection. To see this, note that Costa's argument could be re-established only by assuming a principle to the effect that essentiality implies grounding:

EG $\Box_x\phi \Rightarrow [x \text{ exists}] \lhd [\phi]$
If it is essential to x that ϕ, then the fact that x exists is grounded in the fact that ϕ.

This would lead to **AR3** suffering the same consequences as **AR** since, given *EG*, **AR** would follow from **AR3**. However, nothing at all forces a defender of the present view to maintain *EG*. In fact, *EG* should be untenable in a genuine Aristotelian framework. Compare: it is essential to a man or woman that he or she is a human being, yet the existence of that man or woman is not at all grounded in the fact that he or she is a human being. In particular, that Socrates is human obtains in virtue of Socrates' essence, but nothing prevents an Aristotelian to deny that it is the case that Socrates exists because Socrates is human. So, adoption of a genuine Aristotelian framework is consistent with excluding *EG* and we are left with a respectable version of Aristotelianism about universals.[13]

Finally, notice that use of the essentiality operator can be combined with both the alternative formulations of Aristotelianism previously sketched in this section, leading to the following variants of **AR3**:

(i) $\Box_{\mathbb{U}}\exists x\mathcal{E}(x,\mathbb{U})$ *with exemplification*;

(ii) $\Box_{\mathbb{U}}\exists xU(x)$ *without exemplification*;

[11] See Fine (1995) and Koslicki (2013) for different proposals and for a general survey.

[12] As an example, in the richer context of his four-category ontology (Lowe 2006, p. 200), Lowe assumes that it is part of the essence of the universal that it actually exists only if it is actually exemplified by certain individual substances, in virtue of those substances possessing modes that are particular instances of the universal.

[13] In Costa (2019), discusses the idea of defining the relation of ontological dependence in terms of essence, but the present account is not taken into consideration.

(iii) $\Box_{\mathbb{U}}(uu \text{ exist})$ *with pluralities.*

4 Challenging the notion of grounding

A different line of defense available to an Aristotelian *vis à vis* Costa's argument is to question Costa's use of grounding in the formulation of Aristotelianism and in drawing the argument. In fact, the Aristotelian thesis is typically articulated in terms of ontological dependence[14] and Costa's argument rests on the explicit assumption that ontological dependence can be characterized in terms of grounding, so that to say that a universal $\mathbb{U}$ existentially depends on its exemplifiers amounts to saying that [$\mathbb{U}$ exists] is grounded in the fact that there are entities that exemplify $\mathbb{U}$.[15] Still, focusing on the relation of ontological dependence, we are lead to acknowledge that it is problematic to develop Aristotelianism about universals in terms of grounding, at least when grounding is assumed to be an irreflexive and transitive relation linked with ontological dependence as just mentioned. We will proceed as follows: in Sect. 4.1 we distinguish different kinds of ontological dependence; in Sect. 4.2 we show why, in light of these distinctions, defining ontological dependence in terms of grounding is problematic; finally, in Sect. 4.3 we outline a way to articulate Aristotelianism about universals based only on the notion of ontological dependence.

4.1 Varieties of dependence

In order to shed some light on why the assumption that ontological dependence can be captured in terms of grounding leads to problems, let us first clarify the very notion of ontological dependence. We believe that whoever wants to introduce a notion of ontological dependence should actually accept at least the following three distinct notions.[16]

1. $D_R(x, y)$ (*rigid existential dependence*).
   Constraint: if x rigidly depends on y,
   then necessarily x exists only if y exists.

2. $D_{NR}(x, U)$ (*non-rigid existential dependence*).
   Constraint: if x non-rigidly depends on U,
   then necessarily x exists only if some U exists.

[14] As per the citations proposed in the opening of Costa (2019).

[15] See Costa (2019, p. 1), where the two notions are actually identified: "Such philosophers are realists—they believe that universals exist. Yet they are realists of a certain sort, for they believe universals depend for their existence on their exemplifiers: the existence of a universal is grounded in its being exemplified by something". Here Costa explicitly follows Correia (2008); Lowe (2006). Similar ideas are proposed in Armstrong (1997, 2010).

[16] See Lowe (1998, ch. 6), Koslicki (2013) and Tahko and Lowe (2020) for extensive discussions. Here we are not concerned with the difficult task of providing a definition of these notions. What we will do is just to partly characterize these notions in terms of commonly shared constraints and to contrast them with the notion of grounding.

3. $D_I(x, y)$ (*identity dependence*).
   Constraint: if x depends on y for its identity,
   then necessarily x exists only if y exists.[17]

To illustrate, rigid existential dependence links a set to its members (at least, on some accounts of sets and membership): $\{Socrates\}$ rigidly depends on Socrates for its existence, meaning *inter alia* that, necessarily, $\{Socrates\}$ exists only if Socrates does. Non-rigid existential dependence, instead, links a State's population to a State's citizens: the population of Germany, for example, non-rigidly existentially depends for its existence on the individual German citizens, meaning *inter alia* that, necessarily, the population of Germany exists only if some German does, but the existence of the population does not entail the existence of any particular German person. Finally, identity dependence links once again a set to its members: $\{Socrates, Plato\}$ depends on Socrates and Plato for its identity, meaning that $\{Socrates, Plato\}$ is what it is in virtue of Socrates and Plato being there and being what they are; hence the consequence that, necessarily, $\{Socrates, Plato\}$ exists only if Socrates and Plato do.

Now, an Aristotelian about universals will take universals to depend upon their exemplifiers for their existence. This is the very essence of Aristotelianism, also according to Costa (see above). However, two aspects are worth highlighting:

1. the dependence in question is non-rigid: whereas the existence of $\mathbb{U}$ (e.g. being red) requires the existence of some things that are U (e.g. of some red things), it does not require the existence of any particular thing being U (e.g. of any particular red thing);

2. cases of co-dependence are allowed: an essential universal $\mathbb{U}$ (e.g. being a human being) will non-rigidly existentially depend on its exemplifiers (e.g. human beings), whereas any particular exemplifier of $\mathbb{U}$, (e.g. any particular human being, such as Socrates) will depend on $\mathbb{U}$ for its identity (e.g.Socrates will depend on being a human being for his identity).

According to Lowe (2006, pp. 61–62), for example: (i) non-substantial particulars both rigidly depend for their existence and depend for their identity upon the substantial particulars which they characterize (e.g. Fido's particular whiteness exists and is what he is only because Fido exists and is the way he is, while Fido depends neither for his existence nor for his identity upon his particular whiteness); (ii) both substantial or non-substantial universals non-rigidly depend upon their particular instances (e.g. the kind dog existentially depends on its particular instances without depending specifically on any of them), but they do not depend for their identity upon these instances, since the same universal could have had different instances; (iii) non-substantial universals depend for their existence but not for their identity upon substantial universals (e.g. whiteness would not exist if no kind of thing had the characteristic of being white); (iv) substantial universals depend for their identity, and hence for their existence, upon at least some non-substantial universals (e.g. the kind dog depends for its identity upon some non-substantial universals like carnivorousness). What is worth noting

[17] The rationale for accepting this tenet is that for x to depend for its identity on y is for x to be what *it* is in virtue of y being there and being what y is. Since nothing can exist without being what *it* is, it follows that if x depends on y for its identity then, necessarily, y cannot fail to exist if x exists.

is that there is an interesting co-dependence between substantial and non-substantial universals. Indeed, while the kind dog depends for its identity upon the non-substantial universal carnivorousness, this last universal non-rigidly depends for its existence upon the substantial universal dog, since, as said before, carnivorousness would not exist if no kind of thing had the characteristic of being carnivorous. In conclusion, forms of co-dependence where some x existentially depends on something which depends for its identity on x are perfectly legitimate in this framework.

4.2 Grounding and dependence

Armed with these distinctions about the notion of dependence, we are now in a position to show why characterizing ontological dependence in terms of grounding generates problems in a legitimate Aristotelian framework.[18] We will consider two problems.[19]

A first problem concerns the characterization of the different kinds of dependence. This problem seems to be underestimated by Costa, who assumes that, since Aristotelianism about universals is the thesis that universals ontologically depend on their exemplifiers—notice that it is not specified which kind of dependence is at work—then Aristotelianism can be formulated as the thesis that $[\mathbb{U}$ exists$]$ is grounded in $[\exists x \mathcal{E}(x, \mathbb{U})]$.

To shed some light on this issue, let us assume one of the most general characterizations of the notions of rigid and non-rigid existential dependence in terms of grounding[20]:

(i) $D_R(x, y) := \Box(x \text{ exists} \rightarrow \exists G([x \text{ exists}] \lhd G(y)]))$
(x cannot exist unless its existence is
partially grounded in some fact about y)

(ii) $D_{NR}(x, F) := \Box(x \text{ exists} \rightarrow \exists y(F(y) \wedge \exists G([x \text{ exists}] \lhd [G(y)])))$
(x cannot exist unless its existence is
partially grounded in some fact about some F)

As we are going to show, these characterizations lead to undesired consequences in Costa's framework.

First, however, let us present some good news: the understanding of the Aristotelian thesis proposed by Costa is consistent with the characterization of non-rigid existential dependence just introduced, which means that Costa's understanding of Aristotelianism is consistent with the genuine Aristotelian idea that universals generically depend on their exemplifiers, but do not rigidly depend on any of them (see the previous section). Let us begin by making the assumption, commonly shared by friends of

[18] See also Correia (2020), where some succinct arguments are proposed against this characterization.

[19] Here, we limit ourselves to a consideration of the problems that arise when the connection between dependence and grounding is the one that appears in Costa's argument. In Costa (2019) Costa states to be persuaded by scholars who take the systematic correlations between dependence and operational grounding to be evidence that the latter should be defined in terms of the former. We argue that this persuasion is to be further scrutinized.

[20] Here we follow the ideas proposed in Correia (2020): in particular, the discussion of the notion of ontological dependence presented in Correia (2020, pp. 105–107).

exemplification, that $[\mathcal{E}(\mathbb{U}, s)]$ and $[U(s)]$ are the same fact, i.e., that the fact that s exemplifies $\mathbb{U}$ coincides with the fact that s is U.

Suppose now that $\mathbb{U}$ exists. Then $[\mathbb{U}\text{ exists}] \lhd [\exists x \mathcal{E}(x, \mathbb{U})]$, by **AR**. Thus $\exists x \mathcal{E}(x, \mathbb{U})$, since grounding is factive, and so something is U. Let s be such a U. Then $U(s)$ and, by the transitivity of grounding, $[\mathbb{U}\text{ exists}] \lhd [\mathcal{E}(s, \mathbb{U})]$, given that $[\mathbb{U}\text{ exists}] \lhd [\exists x \mathcal{E}(x, \mathbb{U})]$ and $[\exists x \mathcal{E}(x, \mathbb{U})] \lhd [\mathcal{E}(s, \mathbb{U})]$, by the instances-first principle. Therefore

1. $\mathbb{U}\text{ exists} \rightarrow U(s) \wedge [\mathbb{U}\text{ exists}] \lhd [\mathcal{E}(s, \mathbb{U})]$
   (by introduction of $\rightarrow$)
2. $\mathbb{U}\text{ exists} \rightarrow U(s) \wedge \exists G([\mathbb{U}\text{ exists}] \lhd [G(s)])$
   (by introduction of $\exists$, second order)
3. $\mathbb{U}\text{ exists} \rightarrow \exists y(U(y) \wedge \exists G([\mathbb{U}\text{ exists}] \lhd [G(y)]))$
   (by introduction of $\exists$, first order)
4. $\Box(\mathbb{U}\text{ exists} \rightarrow \exists y(U(y) \wedge \exists G([\mathbb{U}\text{ exists}] \lhd [G(y)])))$
   (by necessitation)

Note that 4 is granted by the fact that all the assumptions in our derivation are necessary. Hence, since 4 is but the definiens of non-rigid existential dependence according to the characterization introduced above, we conclude that $[\mathbb{U}\text{ exists}] \lhd [\exists x \mathcal{E}(x, \mathbb{U})]$ implies that $\mathbb{U}$ is *non-rigidly ontologically dependent* on the Us. As a consequence, the definition of the Aristotelian thesis proposed by Costa is indeed a way to articulate the Aristotelian idea that universals non-rigidly depend for their existence on their exemplifiers.

Now, the bad news: the instances-first principle, together with the notion of non-rigid dependence just introduced, leads to undesired consequences. In fact, starting from the previous supposition that $\mathbb{U}$ exists, and the immediate consequence that $[\mathbb{U}\text{ exists}] \lhd [\exists x \mathcal{E}(x, \mathbb{U})]$, the instances-first principle allows us to derive that $[\mathbb{U}\text{ exists}] \lhd [\mathcal{E}(s, \mathbb{U})]$. From this, it follows that

1. $\mathbb{U}\text{ exists} \rightarrow [\mathbb{U}\text{ exists}] \lhd [\mathcal{E}(s, \mathbb{U})])$
   (by introduction of $\rightarrow$)
2. $\mathbb{U}\text{ exists} \rightarrow \exists G([\mathbb{U}\text{ exists}] \lhd [G(s)])$
   (by introduction of $\exists$, second order)
3. $\Box(\mathbb{U}\text{ exists} \rightarrow \exists G([\mathbb{U}\text{ exists}] \lhd [G(s)]))$
   (by necessitation)

Hence, we conclude that $[\mathbb{U}\text{ exists}] \lhd [\exists x \mathcal{E}(x, \mathbb{U})]$ implies that $\mathbb{U}$ is *rigidly ontologically dependent* on s, where s is any of $\mathbb{U}$'s exemplifiers. If so, then a problem arises, since an Aristotelian would reject the claim that a universal rigidly depends on *any* of its particular exemplifiers. Therefore, the fact that such claim can be derived from Costa's formulation of Aristotelianism counts against that very formulation.

A second, and more general, problem concerns the possibility of ontological co-dependence. It is widely acknowledged that cases of ontological co-dependence are not only possible, but necessary in order to understand some fundamental aspects of

the world.[21] Still, given the irreflexivity and transitivity of grounding, the definitions of dependence introduced above, together with *RF*, exclude such cases. To be sure, with respect to rigid existential dependence,[22] suppose that $D_R(x, y)$ and $D_R(y, x)$, where both x and y exist. Then the fact that x exists, i.e. [x exists], is grounded in some fact about y, say $[U_1(y)]$, and the fact that y exists, i.e. [y exists], is grounded in some fact about x, say $[U_2(x)]$, So, since in general $[U(s)]$ and $[\mathcal{E}(s, \mathbb{U})]$ are the same fact, the existence of x is grounded in the fact $[\mathcal{E}(y, \mathbb{U}_1)]$ and the existence of y is grounded in the fact $[\mathcal{E}(x, \mathbb{U}_2)]$. But, by the relata-first principle, $[\mathcal{E}(y, \mathbb{U}_1)]$ is grounded in [y exists] and $[\mathcal{E}(x, \mathbb{U}_2)]$ is grounded in [x exists]. So, the existence of x, i.e. [x exists], is grounded in [y exists], whereas the existence of y, i.e. [y exists], is grounded in [x exists]. Therefore [x exists] and [y exists] are grounded on each other, in contradiction with the irreflexivity and transitivity of grounding.

In conclusion, it seems legitimate to rise the question: is it sensible to characterize the dependence relations holding in an Aristotelian framework in terms of grounding? And, in general: is it sensible to characterize the dependence relations in terms of grounding? What we conjecture, given the previous arguments, is that it is hardly possible to uniformly define different kinds of ontological dependence in terms of a unique notion of grounding in an Aristotelian framework. This undermines Costa's criticism.

4.3 Assuming dependence as primitive

The upshot of the previous section is that we had better not use a generic notion of grounding to formulate a thesis involving the notion of ontological dependence, at least if such formulation is coupled with the principles that Costa assumes in constructing his argument. A better idea is then to formulate the Aristotelian thesis directly in terms of non-rigid existential dependence, so as to make a universal dependent for its existence on its exemplifiers, but not dependent for its existence on any particular exemplifier. The thesis in terms of dependence becomes

ARD $D_{NR}(\mathbb{U}, uu)$
A universal $\mathbb{U}$ non-rigidly existentially depends on any of the entities which are U, i.e., anything which exemplifies it.

In assuming this interpretation, an immediate question we are required to address concerns the dependence of the things that exemplify $\mathbb{U}$ on $\mathbb{U}$ itself. Indeed, one could argue that the plurality of the items that are $\mathbb{U}$, on which $\mathbb{U}$ is being maintained to depend, is identified by referring to $\mathbb{U}$, and so it should itself be taken to be dependent upon $\mathbb{U}$, since there would be no plurality of entities that are $\mathbb{U}$ if there were no $\mathbb{U}$ in the first place. We think we should grant this point and advance the idea that the way in which $\mathbb{U}$ depends on the uu is different from the way in which the uu are dependent on $\mathbb{U}$. To be sure, $\mathbb{U}$ depends on the uu by being non-rigidly existentially dependent on them, while the uu depend on $\mathbb{U}$ by being identity dependent on it. On this background,

[21] Specifically, we can think of cases such as: determinables and their determinates; kinds and their instances; types and their tokens; structures and their objects; trope-bundles and tropes. See Barnes (2012), Bliss (2018), Morganti (2018), Thompson (2018), Wolff (2012) for extensive discussions.

[22] A similar argument can be formulated with respect to the notion of non-rigid existential dependence.

then, a universal is assumed to depend for its *existence* on its exemplifiers, whereas the exemplifiers are assumed to depend for their *identity*, and not for their existence, on the universal. Hence, we are simply facing a case of co-dependence:

1. $D_{NR}(\mathbb{U}, uu)$;
   $\mathbb{U}$ non-rigidly existentially depends on anything which exemplifies it.
2. for any x in the uu, $D_I(x, \mathbb{U})$; any x which exemplifies $\mathbb{U}$ depends for its identity on $\mathbb{U}$.

However, no contradiction is derivable from 1 and 2, since we are not forced to admit that 1 and 2 imply that there is a sense in which $\mathbb{U}$ depends on itself according to a generic notion of ontological dependence, of which both non-rigid and identity dependence are species, and which is assumed to be irreflexive and transitive. There simply is no such thing as a general relation of ontological dependence like this.

5 On irreflexivity and the relata-first principle

In this paper, we have been presenting four different ways to escape Costa's objection against Aristotelianism about universals by adopting different formulations of Aristotelianism than the one which the argument assumes and attacks. But we believe that an Aristotelian about universals can defend herself from Costa's objection also while sticking to the very version of Aristotelianism criticized by Costa, namely the thesis that

AR $[\mathbb{U}\text{ exists}] \lhd [\exists x \mathcal{E}(x, \mathbb{U})]$

It is in fact possible for an Aristotelian to answer Costa's argument not by denying **AR**, but by rejecting one of the other principles involved in the *reductio*. In particular, we believe that

1. there are reasons to challenge *IG,* at least in a context, like that of Aristotelianism, where wholes can be fundamental;
2. there are reasons to challenge *RF*, at least in the context of Aristotelianism about universals.

Let us clarify these points.

5.1 Challenging the irreflexivity of grounding

The argument we are going to present is the following: in a metaphysical framework where wholes are ontologically prior to their parts, partial ground, defined so that x is partially grounded in y just in case y is a part of a full ground of x, is not irreflexive; the Aristotelian framework we are considering is such that $[\mathbb{U}\text{ exists}]$ is part of $[\mathcal{E}(s, \mathbb{U})]$ and $[\mathcal{E}(s, \mathbb{U})]$ is ontologically prior to $[\mathbb{U}\text{ exists}]$; therefore, the Aristotelian

framework we are considering is a metaphysical framework where partial ground is not irreflexive.[23]

As to the first premise, let us assume that the notion of partial ground can be characterized in terms of the notion of full ground and the notion of parthood as per the following definition:

$$x \lhd y := y < g \quad \text{and} \quad x \lhd_{\text{full}} g \text{ for some } g$$

where $\lhd_{\text{full}}$ is the notion of full grounding and $<$ is the notion of parthood.[24]

It can now be challenged that this notion is irreflexive in a framework where wholes are ontologically prior to their parts. Suppose that g is such a whole, that x is a part of g and that the existence of x is fully grounded in the existence of g. Then we get $x < g$ and $x \lhd_{\text{full}} g$ for some g, and so $x \lhd x$, by the previous characterization of partial ground. In other words, if a fundamental whole is a full ground for a part x, then x, which is a part of a full ground of x, will be a partial ground for itself. Thus, the assumption that the relation of partial ground is necessarily irreflexive can be put into question in a framework where wholes are ontologically prior to their parts.

As to the second premise, let us see why the Aristotelian framework we are considering is such that [$\mathbb{U}$ exists] is part of [$\mathcal{E}(s, \mathbb{U})$] and [$\mathcal{E}(s, \mathbb{U})$] is ontologically prior to [$\mathbb{U}$ exists]. Since Costa is silent on what precisely an existential fact like [$\mathbb{U}$ exists] is and on the way in which the mereological relation between such a fact and a fact like [$\mathcal{E}(s, \mathbb{U})$] is to be conceived, we have a certain freedom of interpretation. What we want to advance is twofold: on the one hand, we argue that [$\mathbb{U}$ exists] is a part of [$\mathcal{E}(s, \mathbb{U})$]; on the other hand, we argue that [$\mathcal{E}(s, \mathbb{U})$] is a full ground of [$\mathbb{U}$ exists]. We can argue in favor of the idea that [$\mathbb{U}$ exists] is a part of [$\mathcal{E}(s, \mathbb{U})$] both from the point of view of an informational conception of facts, where facts are viewed as true contents of thought, and from the point of view of a situational conception of facts, where facts are viewed as portions of the world.[25] From the first point of view, we note that part of the content of a proposition stating that s exemplifies $\mathbb{U}$ is that $\mathbb{U}$ exists, and so that a fact like [$\mathbb{U}$ exists] is part of a fact like [$\mathcal{E}(s, \mathbb{U})$], because part of what we conceive in conceiving [$\mathcal{E}(s, \mathbb{U})$] is that $\mathbb{U}$ exists.[26] From the second point of view, we note that a fact like [$\mathbb{U}$ exists] adds nothing new to a portion of the world like [$\mathcal{E}(s, \mathbb{U})$], since any such portion is a situation in which $\mathbb{U}$ exists, being $\mathbb{U}$ a constituent of [$\mathcal{E}(s, \mathbb{U})$]. In addition, assuming that [$\mathbb{U}$ exists] is part of [$\mathcal{E}(s, \mathbb{U})$] allows us to highlight a pleasant connection between the metaphysical relation of exemplification and the mereological relation of common parthood, since two particulars s_1 and s_2 exemplify the same uni-

[23] We assume a characterization of partial ground in terms of parthood. Nothing essential depends on that: the following argument can also be formulated under the assumption that x is a partial ground of y just in case x is one of the facts which constitute a full ground for y.

[24] See Correia (2020), Fine (2012) and Trogdon (2013) for an introduction to the multifarious notions of ground and their connections.

[25] We are not implying here that the following arguments are indisputable or that invoking a relation of parthood is the unique way to understand the connection between [$\mathbb{U}$ exists] and [$\mathcal{E}(s, \mathbb{U})$]. We only want to advance that the idea that [$\mathbb{U}$ exists] is a part of [$\mathcal{E}(s, \mathbb{U})$] is both consistent with the way we usually understand facts and intuitively supported by such understanding.

[26] This derivation of the mereological relations between facts from the relations between propositions can be fully formalized. See Meixner (1997) for a comprehensive formulation of a mereology of facts.

versal precisely when $[\mathcal{E}(s_1, \mathbb{U})]$ and $[\mathcal{E}(s_2, \mathbb{U})]$ share [$\mathbb{U}$ exists] as a common part. Let us now argue in favor of the assumption that [$\mathbb{U}$ exists] is fully grounded by $[\mathcal{E}(s, \mathbb{U})]$. The argument in this case is straightforward: a key difference between a full ground and a partial ground is that a full ground is typically assumed to necessitate the existence of what is grounded;[27] but $[\mathcal{E}(s, \mathbb{U})]$ necessitates the existence of $\mathbb{U}$, being $\mathbb{U}$ a constituent of $[\mathcal{E}(s, \mathbb{U})]$; therefore $[\mathcal{E}(s, \mathbb{U})]$ is a full ground for [$\mathbb{U}$ exists].

In conclusion, having argued that [$\mathbb{U}$ exists] $\prec$ $[\mathcal{E}(s, \mathbb{U})]$ and that [$\mathbb{U}$ exists] $\lhd_{\text{full}}$ $[\mathcal{E}(s, \mathbb{U})]$, we are in a position to reject the assumption that the relation of partial grounding is irreflexive, and therefore to claim that [$\mathbb{U}$ exists] $\lhd$ [$\mathbb{U}$ exists] is not problematic after all.

5.2 Challenging the relata-first principle

According to *RF*, the existence of the relata of any instance of a relation is prior to the holding of that instance of that relation, and indeed it is a ground for this.[28] Still, this idea, *per se*, is objectionable. The argument we present is the following: there are cases where the existence of the relata of an instance of a relation is not prior to the holding of that instance; in the Aristotelian framework we are considering, facts of exemplification are such cases; therefore, the Aristotelian framework we are considering is a metaphysical framework where *RF* fails.

As to the first premise, there are indeed cases in which it is intuitive to assume that the existence of the relata is prior to the holding of a relation among them, such as the case of Jupiter being greater than Mars, or the case of a pencil being one meter apart from a computer. However, there are also cases in which at least one of the relata seems to have no priority with respect to the holding of the relation. This seems to be the case in particular for relations of ontological dependence. If x ontologically depends on y as to its existence, than it seems that x's existence should not be held to be prior to the relation of ontological dependence linking x to y. To the contrary, defending such priority, and holding that x's existence is one of the grounds of x's ontological existential dependence on y, seems to go against the very idea that *x ontologically depends on y as to its existence*. Indeed, given that x owes its existence to y, it seems reasonable to hold that x's existence is not prior to its depending on y. That a similar situation can arise is particularly evident in cases involving fictional entities, in a context in which such entities are not taken to have an independent existence. Let us consider a particular act of imagination, for instance the act of imagining Superman. In this case it is difficult to see why we should assume that the existence of Superman is a ground for the existence of the act of imagination: in fact, if that were the case, it would be impossible to think of fictional entities altogether. To the contrary, we assume that the existence of Superman is ontologically dependent on the act of imagination, even if Superman is one of the relata of that act.

[27] See Correia (2020) and Trogdon (2013) for a discussion.

[28] Here we are going to assume that being a ground for a fact is sufficient for the ground to be prior to the grounded fact. This assumption is in line with the idea that grounding is a strict partial ordering on the domain of facts.

As to the second premise, it is part of an Aristotelian framework that what is exemplified, namely a universal, depends for its existence on what exemplifies it. So exemplification always brings dependence,[29] and therefore cases of exemplification are cases where the existence of the relata of an instance of a relation is not prior to the holding of that instance.

In conclusion, *RF* is not applicable to the relation of exemplification, since the second item of an instance of exemplification is not prior to the holding of that instance, and this stops Costa's *reductio*. In fact, why claiming that a universal should in the first place exist in order to be exemplified, if no universal possibly exists without being exemplified, and if universals owe their existence precisely to their being exemplified?

6 Conclusion

In this paper, we argued that there are a number of ways Costa's argument can be resisted and that each of these ways is consistent with, or actually fairly faithful to, an Aristotelian stance on universals and their dependence on what exemplifies them. In doing this, we also demonstrated the potential complexity of articulating the Aristotelian thesis and the various lines of research that such enterprise opens. A natural follow up would be to provide a full theory about the connection between universals and their exemplifiers in an Aristotelian framework, but this is beyond the limits of the present work.

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[29] This is the standard Aristotelian view, as proposed in *Categories* 5: see, for instance, Corkum (2013).

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