



Forms and Compounds in Koslicki's Mereological Hylomorphism

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Abstract

Kathrin Koslicki is one of the leading authors of mereological hylomorphism, a non-reductive theory that construes material objects as mereological fusions of matter and form. Accordingly, Michelangelo's *David* has both a portion of marble and *David's* individual form as proper parts. I individuate two kinds of dependence that play an important role in characterising Koslicki's brand of hylomorphism. First, forms depend for their existence on the compounds of which they are parts. Second, hylomorphic compounds depend for their identity on their forms. The existential dependence of forms on their compounds ensures forms cannot float free of material objects, whereas the identity dependence of material objects on their forms grants forms play a non-trivial role in determining the nature of their compounds. The main goal of the present paper is to argue that these two claims of dependence lead to a contradiction when conjoined with some further weak principles concerning parthood and grounding. I then briefly illustrate which are the theoretical commitments that Koslicki may arguably relax to avoid the impasse. In the end, though, her brand of hylomorphism will be in a worse dialectical position.

Keywords Hylomorphism · Dependence · Identity · Grounding · Koslicki

1 Introduction

Mereological hylomorphism is the thesis according to which material objects are mereological fusions of matter and form (Fine, 1999, 2008; Goswick, 2018; Koslicki, 2008, 2018; Oderberg, 2007). Thus, hylomorphic compounds have not only have material parts, but formal parts as well. Consider Socrates: he has both a material and a formal profile. Among the material parts of Socrates, we find a

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certain plurality of water molecules, a certain couple of hands, a certain cardiovascular system, and so on. His maximal material part is the fusion of such parts, that is, Socrates' body. The formal mereological profile of Socrates consists instead of a formal part which, crucially, he does not share with his body.

Kathrin Koslicki is one of the leading theorists of mereological hylomorphism, as well as one of the philosophers that has most contributed to its development. Throughout the years, she has polished and deeply explored her version of mereological hylomorphism (e.g., in her 2008, 2018, 2020). Particularly, in her (2018), she embraces a conception of hylomorphic forms according to which forms are non-repeatable individuals. Socrates is thus the mereological fusion of his body and *his* form, a form that he does not share with any other hylomorphic compound.¹ Inasmuch their mereological fusion, Socrates has both his body and his form as proper parts. Koslicki's theory is thus different from other formulations of hylomorphism. On the one hand, it differs from 'staunch' versions of hylomorphism, as Koons (2014) calls them, according to which the forms are emergent powers that generate hylomorphic compounds and account for their structure and persistence over time (Jaworski, 2016; Koons, 2014). On the other hand, it also differs from Fine's (1999, 2008) version of mereological hylomorphism, which regards the operation that generates hylomorphic compounds from their matter and form as distinct from mereological fusion (see especially Fine, 2008: 111–112).

Koslicki (2018) spends many words discussing various dependence issues relating hylomorphic compounds, their form, and their matter. I wish to discuss the tenability of certain dependence relations that, Koslicki argues, hold between hylomorphic compounds and their forms. Specifically, I am interested in two kinds of dependence relations that involve a hylomorphic compound and its form. First, hylomorphic compounds are (essentially) identity-dependent upon their forms (Koslicki, 2018: 188). Second, forms rigidly depend on their hylomorphic compounds (Koslicki, 2018: 189). In the next section, I aim to show that these two dependence claims, at least when certain principles concerning grounding and parthood are taken on board, because they lead to a problematic circularity. I will rely on a ground-theoretical construction of dependence and a standard conception of grounding as a strict partial order.

The argument I am proposing here has important contact points with Fiocco's (2019) criticism against the identity-dependence of hylomorphic compounds on their forms. Notice, however, that while Fiocco's argument employs a general relation of explanation, my argument focuses on the nature of grounding. This allows me to use ground-theoretical definitions of dependence, which many philosophers take as among the most promising to capture the metaphysical phenomenon of dependence, as well as to formulate with precision principles concerning some classes of relations. Still, there is an intimate relation between grounding and metaphysical explanation (Thompson, 2021: 260–261). According to unitism, grounding just is a relation of metaphysical explanation, whereas, according to separatism, grounding

¹ Koslicki has previously defended, and later abandoned, a universalistic conception of form. See her (2008).

relations back metaphysical explanations. Depending on which of these approaches one endorses, the relation between my argument and Fiocco's one changes. If unitism is true, the present argument may be regarded as a more in-depth version of Fiocco's, including the discussion of various aspects that Fiocco does not take into consideration. If separatism is true, the grounding relations I indicate in this work should be taken as tracking some of the explanatory relations Fiocco's paper puts into question, and thus the best way to look at the present argument would be as corroborating Fiocco's one.

2 Two Ways of Dependence

Let us now consider the two kinds of dependence that generate the abovementioned tension. First, hylomorphic compounds are (essentially) identity-dependent upon their forms (Koslicki, 2018: 188). Notice that 'identity' does not refer here to the identity sign '=', but rather to «what a thing is, or which thing of a certain kind a thing is», as Tahko and Lowe (2020) nicely put it. In other words, the term refers here to the individual essence of an entity (Lowe, 2012: 216–217). Sets are a typical example of identity dependent entities, since every set depends for its identity on its members. Thus, the claim that hylomorphic compounds depend for their identity upon their forms ultimately boils down to the claim that forms contribute to determine the individual essence of hylomorphic compound. As Koslicki remarks, «[...] it is part of Socrates' essence that he is the hylomorphic compound which results from the presence of Socrates' soul in some suitable body» (2018, p. 188).² Oderberg, who develops an alternative version of mereological hylomorphism, expresses the identity dependence of hylomorphic compounds upon their forms by claiming that a form is «that from which the identity of the substance is derived – that *by virtue of which* the substance is what it is» (Oderberg, 2007: 66). By following Tahko and Lowe (2020), we can formulate identity dependence as follows:

(ID) x depends for its identity upon $y =_{\text{def}}$ There is a relation R such that it is part of the essence of x that x is related by R to y

The relation R is here *having _ as hylomorphic form*. So, for instance, Socrates depends for his identity upon his particular form f because it is part of the essence of Socrates that he has f as his hylomorphic form.

Second, forms rigidly depend on their hylomorphic compounds (Koslicki, 2018: 189). Koslicki's conception of forms is Aristotelian, as opposed to a Platonic one, in that she characterises forms as entities that cannot exist apart from the hylomorphic compounds they contribute to make up. More specifically, Koslicki infers the dependence of forms upon their hylomorphic compounds from her claim that forms cannot exist apart from their hylomorphic compounds by means of the following definition of ontological (rigid) dependence:

² In the quote, "Socrates' soul" is clearly a colourful expression to refer to Socrates' hylomorphic form.

(RD_{MODAL}) x rigidly depends on $y =_{\text{def}}$ Necessarily, if x exists then y exists

Koslicki thus accepts that (RD_{MODAL}) can make sense of the dependence of forms on the compounds of which they are parts.³ However, definitions of this sort suffer from notorious drawbacks.⁴ One of the most obvious one is that (RD_{MODAL}) makes everything rigidly dependent on necessary existent entities. Since the number nine exists necessarily, it is trivially true that, necessarily, if x exists, then the number nine exists, no matter what x is. Moreover, (RD_{MODAL}) characterise any two necessary co-existent entities as rigidly co-dependent. Not only this leads to questionable results, such as the rigid co-dependence of the numbers nine and eight, but also to intuitively false ones. Consider Socrates and his singleton $\{\text{Socrates}\}$. According to (RD_{MODAL}) , they are co-dependent entities; yet, it seems that the dependence here should be one-way, with $\{\text{Socrates}\}$ rigidly depending on Socrates.

Philosophers have thus been trying to overcome the impasse by advancing more fine-grained analyses of dependence. The attempt I regard as the most successful is the formulation of dependence through the hyper-intensional relation of grounding, that manages to express a relation between the dependent entity and its dependee(s) stronger than mere necessitation (see, e.g., Correia, 2005, 2008; Schnieder, 2006, 2020, 2021). I take grounding to be a many-one relation that takes facts as relata, which I indicate by means of angle brackets. Moreover, I stick to the standard conception of grounding as a strict partial ordering, hence as an irreflexive and transitive (and thus asymmetric) relation. Last, I use here a disjunctive notion of full or partial grounding (as in Rosen, 2010: 115). Given such qualifications, the relevant ground-theoretic notion of dependence is the following:

(RD) x rigidly depends on $y =_{\text{def}}$ Necessarily, if x exists, then there is a property F such that $\langle x \text{ exists} \rangle$ is grounded in $\langle y \text{ is } F \rangle$ (Schnieder, 2021: 114)

Would Koslicki still claim that forms rigidly depend on their compounds even granted the ground-theoretic definition above? After all, she originally *infers* such dependence from (RD_{MODAL}) and the Aristotelian claim that forms cannot exist apart from their compounds.

All in all, she would arguably better off acknowledging the existence of such rigid dependence relation between forms and their compounds and endorse (RD) as the correct definition of rigid dependence. Otherwise, she should just accept the holding of a necessary connection between the existence of Socrates's form f and the existence of Socrates as a brute fact. Notice that Koslicki herself opposes brute necessary connections. In her discussion of cross-world principles for individuals, she points that, in order to explain why no poached egg may ever instantiate

³ In addition to (RD_{MODAL}) , Koslicki also endorses more fine-grained, non-modal definitions of dependence (see her 2018: ch, 5). However, since those further definitions do not play a role in the present argument, I prefer to ignore them.

⁴ Such drawbacks have been the main drivers of the raise of the post-modal metaphysics. See Wildman (2020) for a nice introduction.

Socrates' haecceity, one must appeal to an «externally imposed necessary connection» (Koslicki, 2018, 97), and then takes this as motivating a different account of transworld tracking of individuals. Moreover, as Sider remarks, a tenet of contemporary post-modal metaphysics is that «[i]f a truth is necessary, there must be some reason for why this is so» (Sider, 2020, p. 211). And of course, the rigid dependence of forms on hylomorphic compounds adequately explains the fact that former cannot exist apart from on the latter.

Moreover, the parallel with the Aristotelian conception of universals is particularly telling on this respect. Aristotelian universals, as opposed to Platonic universals, cannot exist uninstantiated, that is, apart from their instances: necessarily, if an Aristotelian universal exists, then there are some of its instances. Take the Aristotelian universal *humanity*: necessarily, if there is *humanity*, then there are some humans. Aristotelian universals thus surely satisfy the generic counterpart of (RD_{MODAL}); yet (RD_{MODAL}) does nothing but register a necessary connection between the relata.⁵ Many philosophers have thus opted for characterising the Aristotelian conception of universals in ground-theoretic terms (Cameron, 2014; Correia, 2005, 2008; Costa, 2021; Raven, 2022). For instance, Cameron (2014: 96) claims that «you can't have the universal F-ness without something that is F to give ground to it»; Costa (2021: 4332) that «if a universal *U* exists, then $\langle U \text{ exists} \rangle$ is grounded in $\langle \text{Something exemplifies } U \rangle$ »; and Raven (2022: 4) that «if a universal *U* exists, then some instantiation of it helps ground *U*'s existence». The framing in ground-theoretic terms vindicates the rationale of the claim according to which Aristotelian universals exist *in virtue of* being instantiated, grounding expressing a relation of determinative metaphysical explanation. Since Aristotelian universals display a kind of dependence on their instances that, despite being generic rather than rigid, is analogous to Koslicki's Aristotelian hylomorphic forms, and since the most widespread formulation of Aristotelianism on universals is ground-theoretic, an extension of the post-modal definition to hylomorphic form is definitely reasonable.

Suppose then that Koslicki's Aristotelian intuition, according to which forms cannot exist apart from their hylomorphic compounds, should be formulated in terms of a post-modal definition of rigid dependence. Particularly, I take the most promising phrasing to be the following:

(RD_{FORMS}): For every form *f*, for every hylomorphic compound *c* having *f* as hylomorphic form: Necessarily, if *f* exists, then $\langle f \text{ exists} \rangle$ is grounded in $\langle c \text{ has } f \text{ as hylomorphic form} \rangle$

With Aristotelian universals, what grounds the existence of a universal is the existentially quantified and relational fact that something instantiates such universal; with Aristotelian hylomorphic forms, what grounds the existence of a form is the relation fact that such form is a proper part of its hylomorphic compound.

⁵ Moreover, see Correia (2008, 1026–1027) for a more general argument according to which the Aristotelianism vs Platonism debate on universals cannot be successfully construed as a debate on whether universals necessitate their instance, as for (RD_{MODAL}).

Koslicki's brand of mereological hylomorphism features these two kinds of dependence between forms and hylomorphic compounds. On the one hand, hylomorphic compounds depend for their identity on their forms; on the other hand, forms depend for their existence on the compounds of which they are parts. The first dependence claim ensures that forms play a constitutive role regarding the individual essence of their compounds. The second dependence claim ensures instead that forms cannot float free from their compounds. In the next section, I show that these dependence claims lead to a problematic circularity of grounding when paired up with a couple of seemingly acceptable principles. In doing so, I basically follow an argumentative pattern that Barnes (2018), Costa (2021) and Raven (2022) have used to prove a similar circularity arising with Aristotelian universals. We may regard my following argument as posing a dilemma to Koslicki. If she sticks with the dependence claims she actually endorses, she must face the problems of the inadequacy of the weak formulation of dependence (RD_{MODAL}). If she endorses the ground-theoretical formulation of dependence, she gets the circularity problem I discuss in the next section stronger.

3 Forms, Hylomorphic Compounds and a Contradiction

The identity dependence of hylomorphic compounds on their forms and the existential dependence of forms on their compounds are actually mutually consistent on their own. In order to prove a contradiction, we need a couple more principles. The first principle I want to introduce is Relata First:

(RF) $\langle R(x, y, \dots) \rangle$ is grounded in $\langle x \text{ exists} \rangle$, $\langle y \text{ exists} \rangle$, ...

The Relata First principle was originally presented by Costa (2021: 4332) and concerns what grounds the holding of relations. According to this principle, the fact that a relation R holds is grounded in the existence of the relata of R , and thus is partially grounded in the existence of each relatum. The relata are 'first' with respect to the relation because their existence is ontologically prior to the holding of the relation, and (RF) take such a priority at face value by insisting on the existence of a grounding relation underneath.

If we accept (RF), a contradiction immediately follows from (RD_{FORMS}). Let us consider the instance of (RD_{FORMS}) featuring Socrates and his form f . Since Socrates actually exists, we have that

(1) $\langle f \text{ exists} \rangle$ is grounded in $\langle \text{Socrates has } f \text{ as hylomorphic form} \rangle$

From (1), the factivity of grounding, and (RF), we have that.

(2) $\langle \text{Socrates has } f \text{ as hylomorphic form} \rangle$ is grounded in $\langle f \text{ exists} \rangle$

Of course, since (RF) grants that the holding of a relation is grounded in the existence of the relata, it also grants that it is grounded in the existence of one of them. From (1), (2), and the transitivity of grounding we have that:

(3) $\langle f \text{ exists} \rangle$ is grounded in $\langle f \text{ exists} \rangle$

However, grounding is irreflexive, so that the following is true:

(4) $\langle f \text{ exists} \rangle$ is not grounded in $\langle f \text{ exists} \rangle$

And (3) and (4) are mutually inconsistent.

The present version of the argument just uses (RD_{FORMS}), which is an efficacious way to frame of Aristotelianism concerning form, and (RF), the plausible principle according to which the existence of relata is ontologically prior to their being related, along with basic properties of grounding.⁶ Clearly, if a straightforward formulation of Aristotelianism for hylomorphic forms and an intuitive principle concerning relations is all we need to prove a circularity, there are bad news for Koslicki's conception of forms. Still, there seems to be room to improve the dialectical position of her brand of mereological hyomorphism.

I suppose that the argumentative step most likely to draw criticism is the endorsement of (RF), or at least the use of (RF) in the present context. For instance, Imaguire (2021) criticises (RF) by means of a class of counterexamples, namely by indicating a kind of relations that contravenes (RF). Specifically, he claims that 'creating relations' are such that the existence of one of the relata is grounded in the fact that the relation holds. Among his examples, there are *writing*, *giving birth to*, *building*. Consider: Wittgenstein wrote the *Tractatus*, thus the existence of the *Tractatus* is not 'ontologically prior' to the instance of the *writing* relation between it and Wittgenstein. Rather, the opposite is true: the instance of the relation is 'ontologically prior' to the existence of the *Tractatus*. Hence, the existence of the *Tractatus* is grounded in the instance of the creating relation Wittgenstein bears to it. Furthermore, Imaguire claims that the exemplification relation between objects and Aristotelian universals is indeed a creating relation, in that «the apple 'creates' redness by exemplifying it» (Imaguire, 2021). Clearly, there is a deep analogy here with the *having _ as hylomorphic form* relation. Since there may be a sense in which Socrates, or maybe any human being, 'creates' his individual form by having it, the soundness of (RF) in the present context may be questioned.

Giordani and Tremolanti (2022) make basically the same point as Imaguire (2021) by claiming that (RF) is questionable for all the relations that systematically imply a dependence relation: that is, for all those relations R such that, if Rxy ,

⁶ Actually, Koslicki (2018, p. 188) already warns about a threat of circularity arising from the dependence relations between hylomorphic forms and their bearers. She suggests avoiding construing hylomorphic forms as *essentially* and *constitutively* dependent upon their bearers. Notice, though, that the present argument just assumes that hylomorphic forms *rigidly* depend upon the compounds of which they are parts; and we have argued above that Koslicki is better off regarding the assumption as sound.

then x depends on y . They mention the suitable imaginative relation that takes as arguments a creative agent and a fictional entity. Hercule Poirot, for instance, owes its existence to the act of imagination relating him with Agatha Christie. In other words, the existence of Hercule Poirot is grounded in the fact that Agatha Christie originally imagined him. We are facing a further creating relation and thus a further counterexample to (RF). Giordani and Tremolanti (2022) extend their considerations to Aristotelian universals and the instantiation relation:

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? (Giordani & Tremolanti, 2022: 17)

Such quote has a straightforward counterpart concerning hylomorphic forms: why claiming that a form should in the first place exist in order to be proper part of its hylomorphic compound, if no form possibly exists without being proper part of its hylomorphic compound, and if forms owe their existence precisely to their being proper parts of their hylomorphic compound? In other words, (RF) really sounds unacceptable in the present case too.

All in all, the critics are led to reject (RF) by considerations on dependence relations, and in particular on the supposed ‘ontological priority’ of the dependent entity over such relations. Still, as the critics themselves admit, (RF) seems generally correct for relations, with creating relations representing an exception to the principle. Thus, they should welcome a principle that captures an analogous intuition of priority for creating relations as well. Let us call creating relations all those relations whose instances systematically imply a corresponding instance of a dependence relation. It is interesting to notice that the aforementioned criticisms are silent on the dependees of creating relations. Creating relations are indeed counterexample to (RF) but they are so just in virtue of considerations on the dependent entities. Since dependent entities are brought into existence by an instance of the appropriate creating relation, it makes little sense claiming that they are nonetheless ontologically prior to such an instance. The corresponding dependees, however, indeed seem to enjoy the ontological priority that (RF) commands even with respect to creating relations. Even though it may not make sense to claim that both Wittgenstein and the *Tractatus* must exist in order to be related by the *writing* relation, Wittgenstein surely must exist. The same holds for all the other kinds of creating relations. Echoing Costa’s (2021) words, we may say that no x and y could ever be creatingly related if the dependee x did not exist in the first place. We thus obtain a corresponding principle, which is a version of (RF) suitably restricted for creating relations and can be expressed as follow:

Dependee First (DF): if R is a creating relation, then, if $\langle R(x, y, \dots) \rangle$ and x is the dependee, then $\langle R(x, y, \dots) \rangle$ is grounded in $\langle x \text{ exists} \rangle$

When (DF) replaces (RF) in the argument above, no contradiction immediately follows. On the supposition that *having _ as hylomorphic form* is indeed a creating relation, (DF) gives:

(2*) $\langle \text{Socrates has } f \text{ as hylomorphic form} \rangle$ is grounded in $\langle \text{Socrates exists} \rangle$

Which, together with (1), just leads to

(3*) $\langle f \text{ exists} \rangle$ is grounded in $\langle \text{Socrates exists} \rangle$

(3*) is quite plausible: Socrates is ontologically prior to his hylomorphic form f . Indeed, his hylomorphic form f comes into existence precisely insofar it is the form of Socrates.⁷

However, recall there is a further kind of dependence that characterises Koslicki's theory: the identity dependence of hylomorphic compounds upon their forms. Although the assumption fits a hylomorphic framework well, it arguably leads here to a contradiction. It seems that, anytime there is an identity dependence relation between two entities, those same entities must also stand in a further (rather weak) dependence relation: namely, the existence of the identity dependent entity is at least partially grounded in the existence of its dependee(s). In other words, when x is identity dependent on the yy , then x exists at least partially *because* the yy exist.

This claim should sound obvious when familiar kinds of identity dependent entities are considered. For instance, take again the set $\{\text{Plato, Aristotle}\}$. It depends for its identity on Plato and Aristotle, in that the two philosophers, being its members, jointly fix the set that $\{\text{Plato, Aristotle}\}$ is. Necessarily, then that set exists *because* there are Plato and Aristotle: Plato and Aristotle are 'ontologically prior' to $\{\text{Plato, Aristotle}\}$, and their existence explains the existence of the set. A further familiar kind of (supposedly) identity dependent entities I wish to consider are events. Particularly, events may very well be claimed to be identity dependent on their participants. Suppose this is correct: then Giacomo and Elisa's marriage is identity dependent upon (at least) Giacomo and Elisa, the relation 'R' being here *has _ as participant*. Again, Giacomo and Elisa's marriage exists, at least partially, *because* Giacomo and Elisa exist. Again, Giacomo and Elisa are 'ontologically prior' to their marriage and their existence at least partially explains the existence of the event.

Maybe the present claim is too strong. In the cases I have mentioned, the relevant entities depend for their identity on some different objects *that make them up*. Obviously, the 'making up' relation varies depending on the category of objects under consideration. Sets are made up of their members, the relation at stake being \in ; events are made up of their participants, although the relation at stake here is slightly

⁷ Moreover, (3*) is arguably the best way to pursue another theoretical strategy on the behalf of Koslicki's hylomorphism, that is, revising (RD_{FORMS}) into a weaker dependence claim. Differently from (3), the grounding relatum in (3*) is just the fact that the appropriate hylomorphic compound exists, not the fact that such hylomorphic compound and its form (which is the subject of the grounded fact) stand in the suitable creating relation. The weakening of (3) into (3*) basically mirrors a proposal due to Giordani and Tremolanti (2022) with respect to the dependence of Aristotelian universals upon their instances. As we are going to see, though, (3*) is sufficient to get Koslicki's theory in trouble when paired up with a further weak principle concerning identity-dependence.

less familiar.⁸ The fact that the existence of a set is grounded in the existence of each of its members, or that the existence of an event is grounded in the existence of its participants, is definitely acceptable. Therefore, even if the thesis according to which when x is identity dependent on the yy , then x exists at least partially *because* the yy exist may be regarded as generally too strong, its restriction over ‘making up’ relations is instead acceptable. I thus assume the following principle:

Making Up Grounding (MUG): If x is identity dependent on y and y (partly) makes up x , then $\langle x \text{ exists} \rangle$ is grounded in $\langle y \text{ exists} \rangle$

Let us close the curve now. Recall that, according to Koslicki’s theory, mereological compounds depend for their identity on their forms. But also, her brand of hylomorphism is *mereological* for one precise reason: every hylomorphic compound has its form as one of its proper parts. Clearly, proper parthood is a ‘making up’ relation, and surely the most natural making up relation with respect to material objects. Therefore, by considering one last time Socrates and his form f , (MUG) implies that:

(5) $\langle \text{Socrates exists} \rangle$ is grounded in $\langle f \text{ exists} \rangle$

Given the transitivity of grounding, (3*) and (5) again imply (3), which contradicts (4). That is, ‘ $\langle f \text{ exists} \rangle$ is grounded in $\langle \text{Socrates exists} \rangle$ ’ and ‘ $\langle \text{Socrates exists} \rangle$ is grounded in $\langle f \text{ exists} \rangle$ ’ imply ‘ $\langle f \text{ exists} \rangle$ is grounded in $\langle f \text{ exists} \rangle$ ’, thus leading to a contradiction with the irreflexivity of grounding.

4 Theoretical Costs of Mereological Hylomorphism

If correct, the preceding arguments should put some pressure on Koslicki’s construction of mereological hylomorphism. However, the argument relies on several assumptions that, although natural within her theory, she may still reject. It may be useful to recap the argument we have discussed so far. First, we have the two dependence claims:

Rigid Dependence of forms: For every form f , for every hylomorphic compound c having f as hylomorphic form: Necessarily, if f exists, then $\langle f \text{ exists} \rangle$ is grounded in $\langle c \text{ has } f \text{ as hylomorphic form} \rangle$

Identity-Dependence of compounds: For every form f , for every hylomorphic compound c having f as hylomorphic form, c identity-depends on f

Second, there is the Dependee First principle:

⁸ Costa (2017) suggests that the participation relation should be taken as primitive. Others, like Kim (1976), construe participation as some sort of constitution. And of course, for a perdurantist like Goodman (1951), according to which events are just ‘unstable objects’, the participation relation reduces to parthood.

Dependee First (DF): if R is a creating relation, then, if $\langle R(x, y, \dots) \rangle$ and x is the dependee, then $\langle R(x, y, \dots) \rangle$ is grounded in $\langle x \text{ exists} \rangle$

Third, the Making Up Grounding principle:

Making Up Grounding (MUG): If x is identity dependent on y and y (partly) makes up x , then $\langle x \text{ exists} \rangle$ is grounded in $\langle y \text{ exists} \rangle$

Fourth, grounding is a strict partial order; fifth, forms are proper parts of hylomorphic compounds. Given these assumptions, the argument can be summarised as follows.

By supposing that f exists, the Rigid Dependence of forms implies that $\langle f \text{ exists} \rangle$ is grounded in $\langle c \text{ has } f \text{ as hylomorphic form} \rangle$. Since *having _ as hylomorphic form* is a creating relation, the Dependee First principle tells that $\langle c \text{ has } f \text{ as hylomorphic form} \rangle$ is grounded in $\langle c \text{ exists} \rangle$. By the transitivity of grounding, we obtain that $\langle f \text{ exists} \rangle$ is grounded in $\langle c \text{ exists} \rangle$. By the Identity-Dependence of compounds, Making Up Grounding, and the claim that forms are proper parts of compounds, it follows that $\langle c \text{ exists} \rangle$ is grounded in $\langle f \text{ exists} \rangle$. Therefore, we obtain two symmetric grounding claims, *contra* the asymmetry of grounding.

Since the argument has various moving pieces, there are several ways in which Koslicki may challenge it. First, Koslicki may claim that hylomorphic forms do not existentially depend on the compounds of which they are part. In other words, she may put aside her background Aristotelianism and embrace instead some kind of Platonism about forms. Such a commitment would of course render mereological hylomorphism theoretically more costly. Particularly, the commitment of the corresponding version of Platonism is akin to that of Williamson's (2013) necessitism. If individual forms do not depend for their existence on the compounds of which they are part, then it seems that the modal recombination of the former cannot be constrained by the latter in those worlds in which the latter do not exist. Hence, it is *prima facie* consistent to claim that, although my possible elder brother does not actually exist, his form does. The same goes with all my possible elder brothers, but also with all the possible yet actually non-existent dogs, rivers, artworks, Martians, carbon dioxide molecules, and so forth. Thus, any world ends up being overpopulated by a multitude of abstract forms: however, again, individual forms which are not part of any hylomorphic compound seem to be no more than ontological danglers.⁹

The additional cost of Platonism is not the only consequence of getting rid of existential dependence. Indeed, Koslicki may propose to avoid dependence relations and claim instead that the relation between hylomorphic forms and their bearers is just necessitation: necessarily, if there is the form, then there are the appropriate

⁹ It is still worth noting that Matthew Tugby has advanced strong arguments for exactly the kind of Platonism I have described here. For instance, Tugby claims Platonism would offer a neat solution to the modal issue of alien properties (2015) and provide the theory of properties that best suits dispositionalism (2013). In other words, Platonism knows how to put those ontological danglers to work.

bearers. For instance, this is precisely Imaguire's (2021) understanding of the relation between Aristotelian universals and their instances. In the end, also Koslicki (2018: 189) seems to lean towards this construction of the modal relation between forms and hylomorphic compounds. Although consistent, I take the major drawback of such a claim to be its lack of informativeness.¹⁰ Consider a pacific case of mere necessitation: for instance, necessarily existent entities are necessitated by anything. There is an explanation for this fact, which does not involve any dependence relation at all: any necessarily existent entity x satisfies the formula $\Box(Ex)$, and thus any formula $\Box(Ey \rightarrow Ex)$ as well. Cases of genuine existential dependence are different. Take tropes: they are necessitated by their bearers *because* their existence is grounded in their bearers being such-and-such. The necessitation is explained by non-trivial features of the relata, not by logic. As far as concerns hylomorphic forms, it seems that the weakest genuine explanation of the necessitation is that their existence is grounded in the existence of their bearers. However, given Koslicki's further commitments, this claim basically amounts to (MUG), so that her brand of hylomorphism would still be on shaky grounds. And of course, she cannot claim that hylomorphic forms necessitate their compounds because the former existentially depend on the latter if existential dependence *just is* necessitation!

What I take to be the most promising way to go forward on this path is instead to reject the present ground-theoretical definitions of dependence (see Giordani and Tremolanti (2022) for a suggestion along these lines in the case of Aristotelian universals). For instance, essence-theoretical definitions of dependence may be ultimately compatible with the circle of dependence the argument aims to show, since, although identity dependence is asymmetric, essential dependence is usually taken to be non-asymmetric (see Tahko & Lowe, 2020).¹¹ Koslicki may claim that every hylomorphic compound depends for its identity upon its form, while every hylomorphic form essentially dependent upon its hylomorphic compound. Yet, it would be up to hylomorphists arguing that essence-theoretical definitions of dependence are independently preferable to ground-theoretical ones, that do enjoy great popularity in the literature.

Second, Koslicki may contend hylomorphic compounds are not identity-dependent on their forms. This claim would prevent the antecedent of (MUG) to be satisfied. However, the identity dependence of hylomorphic compounds upon their forms is a very natural thesis in the context of her brand of hylomorphism, since forms account for many crucial aspects of their compounds. According to Koslicki (2018: 63), for instance, formal parts dictate the variety of the parts available to the wholes which include them, as well as their different possible arrangements. Formal parts play then further metaphysically relevant roles, such as accounting for the high degree of unity which their compounds exhibit, as well as the range of their specific

¹⁰ Relatedly, Fine claims that he would be «[...] decidedly uncomfortable with a conception of form whose presence could float free of the underlying facts» (2020, p. 432).

¹¹ According to Tahko and Lowe (2020), the asymmetry of identity-dependence seems to follow from the non-circularity of identity criteria. If x is what it is partly in virtue of the fact that x has a certain relation with y , then y cannot be what it is partly in virtue of its being suitably related with x . Otherwise, x and y would be deprived by well-defined identity-conditions.

behaviours, and, importantly, accounting for the belonging of their compounds to their respective primary kinds. So formal parts explain many of the essential properties of their compounds. There is more, though: according to Koslicki (2018: 99–103; 2020: 131–136; but see also Fine, 2008: 112–113),¹² hylomorphic forms also account for the transworld identity of their compounds. In other words, forms track their compounds across possible worlds, acting thus like haecceities. Given the pivotal theoretical roles formal parts play, it really seems that it is part of the individual essence of a hylomorphic compound to have the form it has. Therefore, it is natural to take compounds to be identity-dependent upon their forms in the context of her brand of hylomorphism.

Third, Koslicki may say that grounding is not a strict partial order. Whoever opted for this line may find support in the works of several philosophers (Bliss, 2018; Rodriguez-Pereyra, 2015; Thompson, 2016). Yet, since the general consensus is still that grounding is a strict partial order (Fine, 2012; Raven, 2015), denying it amounts to a heterodox claim that inevitably saddles one with the theoretical task of providing very strong arguments to her cause.¹³ It must be admitted, though, that Koslicki is quite sceptical towards grounding itself (see, e.g., Koslicki, 2015), so that she may deem the choice of a non-standard conception of grounding acceptable.

Therefore, Koslicki may very well rebut the previous argument by following one of the lines above. However, the benefit that her theory brings to a conception of material objects would be greatly diminished or would result much weaker or gerrymandered overall. By accepting a transcendentalist hylomorphism, she would threaten her theory with the seemingly unrelated commitment to Platonism, besides offering an unintuitive and uninformative account of the relation between forms and hylomorphic compounds. By accepting an essence-theoretic analysis of dependence, she would need very good independent arguments to claim that the standard ground-theoretic analysis is inadequate. By rejecting the identity-dependence of hylomorphic compounds upon their forms, not only she loses a coherent tool to account for the transworld identity of the former in terms of the latter, but also a suitable explanation of many of the essential features of hylomorphic compounds.¹⁴ Lastly, by advancing a non-standard conception of grounding, she would again burden their theory with further theoretical commitment she would be better off avoid.

5 Conclusions

According to Kathrin Koslicki's formulation of mereological hylomorphism, material objects have both material and formal parts. Every natural whole is mereologically composed of material parts and its own hylomorphic form. There are also some

¹² Fine expresses the claim, within his theory of embodiments, in the guise of the Existence Postulate.

¹³ For a more in-depth presentation of the debate, see Thompson (2021). Slightly differently, Barnes (2018) suggests that the relation of dependence may be non-symmetric. But of course, the relations of dependence and grounding are conceptually close.

¹⁴ Or at least features hylomorphists plausibly wish to maintain as essential.

important dependence relations between material objects and their forms. First, every form existentially depends on the material object of which it is form. Second, every material object identity-dependes on its own form. We have shown that, given the weak principles (DF) and (MUG), together with a ground-theoretic analysis of the notion of dependence and the standard characterisation of grounding as a strict partial order, the two dependence claims lead to a contradiction. Notably, the mereological aspect of forms also plays a role within the argument, to ensure that the identity dependence between material objects and their form satisfies the antecedent of (MUG). The present argument thus puts some pressure on the idea that there is some sort of co-dependence between material objects and their individual forms. The worry, though, is that the dependence claims we have considered play a crucial role in making Koslicki's hylomorphism serviceable as a non ad hoc, substantive Aristotelian proposal on the nature of material objects. I suppose Koslicki should stick to the present dependence claims and rather either reject the ground-theoretic analysis of dependence or the conception of grounding as a strict partial order. In the former case, the alternative analysis most fitting here would be essence-theoretic. Still, such a choice clearly needs independent reasons. Ground-theoretic definitions of dependence are widespread in the literature, and they have the important theoretical virtue of reducing dependence to the cognate notion of grounding. At the very least, then, their rejection would be costly and controversial. Alternatively, Koslicki may opt for a non-standard characterisation of grounding. As we have mentioned, some philosophers have actually argued that dependence and grounding relations are non-asymmetric; and she could join the crowd. The problem is that there is a large consensus over the asymmetry of such relations and therefore, again, the burden would be on Koslicki, who should then provide some unrelated argument to defend a non-standard characterisation of grounding.

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Declarations

Conflict of Interest The author declares that he has no conflict of interest.

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