How to get Necessity from Essence via Identity (or not?)

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1 Leech's challenge to essentialist theories of modality

Jessica Leech (2020) has recently challenged what she calls the *essentialist theory of modality* (ETM), according to which modality can be accounted for in terms of essence.[1] In particular, she focuses on the following statement that she takes to be representative of this view:

(ETM□) It is (metaphysically) necessary that *p* just when it is true in virtue of the essences of things that *p*.

While this statement captures a mere conditional relationship between necessity and essence, both proponents of the view and Leech herself are clear that a stronger relationship is envisaged: The idea is that necessity can be *defined* in terms of essence, that the former can be *reduced* to the latter, or that facts about necessity can be *grounded* in facts about essence. Initially, Leech (2020: p. 2) challenges proponents of ETM to show why essence "should generate necessity". As becomes clear over the course of the paper, she assumes that for this challenge to be met, essence facts (e.g. facts of the form "It is part of the essence of ... that ...") must be necessary.[2] At least on the surface, Leech's challenge is later revealed to be an epistemic one, namely to provide *reasons to believe* that essence facts are indeed necessary. In particular, she argues that the theory of essence in terms of generalized identity in Correia and Skiles (2017) initially appears to be well suited to face the challenge, but falls flat when it comes to justifying the necessity of generalized *self*-identity.

In section 2, I show how proponents of Correia's and Skiles' theory can address Leech's epistemic challenge. As we will see, some aspects of Leech's discussion point towards an alternative, explanatory challenge, namely to provide a sufficient stock of facts about essence or generalized identity to ground all necessities. In section 3 I attempt to identify such a challenge and make a suggestion as to how to address it.

2 On the epistemic challenge

According to Correia and Skiles (2017), essence and grounding can be reduced to generalized identity. Whereas ordinary, objectual identity is expressed by a relational predicate and holds

[1] Two prominent proponents are Fine (1994) and Hale (2002).

[2] This assumption might be challenged; for some discussion of whether the grounds of facts about necessities must be necessary themselves, see Wildman (2019).

between an object and itself, generalized identity – well – generalizes this idea to other grammatical categories. Following Rayo (2013), Correia and Skiles (2017: p. 3) express generalized identity using the operator $\equiv$, indexed by zero or more variables, which takes two open or closed sentences and yields another. Where P and Q are open or closed sentences, they read $P \equiv Q$ as "For it to be the case that P is for it to be the case that Q" and a statement of the form $P \equiv_{x,y,...} Q$ as "For some things x, y, .. to be such that P is for them to be such that Q". Beyond this, it suffices for now to know that according to the proposal of Correia and Skiles (2017: section 2), generalized identity statements *just are* essence statements.[3]

In line with her assumption that ETM involves the necessity of essence claims, Leech assumes that generalized identities must be necessary too, if the theory of Correia and Skiles (2017)) is to be combined with ETM.[4] On behalf of ETM, Leech (2020: pp. 14f.) offers an intriguing argument for the necessity of generalized identities that relies on a version of Leibniz Law for generalized identity and the necessity of generalized *self*-identity. Thus, addressing her challenge comes down to providing reason to believe that generalized self-identities are necessary.[5]

First, two methodological remarks: (i) While Leech (2020: section 2) may correctly reject intuition as a guide to the necessity of essence (or identity claims) in general, she has not argued that intuition cannot guide us in this particular case (after all, she does grant her opponent the assumption of some arguably basic principles such as the version of Leibniz Law for generalized identity). (ii) Leech does not consider the possibility of abductive support (broadly construed): It is plausible that the reductive success of a theory itself lends some epistemic support to its basic assumptions.[6] While the dialectical strength of Leech's challenge thus appears to be limited, it would of course still be nice to address it more decisively, so let us see what we can do.

For objectual identity, it is highly plausible that existence implies self-identity: If a exists, then $a = a$. Alternatively, we can assume that if a exists, then a is identical to something, existential instantiation, symmetry and transivity of identity then deliver $a = a$. It is hard to see how this could be denied; in fact, in the absence of an independent existence predicate, that a exists is usually captured by its being identical to something: $\exists x(a = x)$. Given this, the claim that if a exists then it is identical to something amounts to the trivial claim that if $\exists x(a = x)$, then $\exists x(a = x)$. Again, from the consequent it follows that $a = a$.

Something analogous appears to hold for generalized identity. There are two ways to transpose the idea of existence implying identity to the higher-order setting pertinent to generalized identity. First, in analogy with the idea that objectual existence can be captured using the (objectual) existential quantifier and objectual identity, existence for the higher-order setting can be captured using the sentential existential quantifier and generalized identity. The result is trivial: If $\exists p(P \equiv p)$, then $\exists p(P \equiv p)$.

From this, we can again use existential instantiation, symmetry and transitivity (for generalized

[3] More specifically, they just are statements of *factual* essence.

[4] Note that Correia and Skiles (2017) do at least in this paper not endorse ETM, but they appear sympathetic to generalized identities being necessary.

[5] Leech appears to think that this is systematically problematic for proponents of ETM and the theory of Correia and Skiles (2017), see the next section for a comment.

[6] For some discussion of this idea in modal epistemology, see Biggs (2011) and Kment (2018).

identity, as captured by Correia and Skiles (2017: p. 4)) to derive that if $\exists p(P \equiv p)$, then $P \equiv P$.[7] Perhaps Leech could take issue with the application of symmetry and transitivity here, but the same inference can be made using the version of Leibniz Law for generalized identity that she seems happy to grant the proponent of ETM.[8] Alternatively, an objectual approach involving an existence predicate can be employed: Using square brackets to refer to the proposition expressed within, we can state the following no less plausible principle: If $[P]$ exists, then $\exists p(P \equiv p)$; hence if $[P]$ exists, then $P \equiv P$.[9]

But if this is correct, our success turns on whether claims like "$\exists p(P \equiv p)$" or "$[P]$ exists" are necessary, or (in first order terms) whether propositions exist necessarily. Now, for quantification into sentence position, necessitism seems quite plausible.[10] So, higher-order *necessitists* (more specifically, necessitists with respect to quantification into sentence position) can address Leech's challenge on principled grounds. For example, a possible argument for necessitism goes like this: In every world either P or $\neg P$. But then if P then $\exists p(P \equiv p)$ and by Leibniz Law or the structural axioms for generalized identity, $P \equiv P$. But if $\neg P$, then (speaking in first-order tongue), there is something that is not the case and that is $[P]$. Hence, it is plausible that we can derive from this that $\exists p(\neg p \wedge P \equiv p)$ and from this we can again derive that $P \equiv P$ by Leibniz Law or the structural axioms for generalized identity.[11]

Now, higher-order *contingentists* with respect to quantification into sentence position must of course reject this reasoning. Here is not the place to argue against contingentism, but we should not conclude that the success of ETM is tied to the failure of contingentism: Even (at least some) contingentists want to capture theorems like $P \vee \neg P$ or $P \leftrightarrow P$.[12] But, generalized identity is a kind of equivalence, alike to a strong biconditional. So the question arises what should make it possible that it fails without the corresponding material (or even necessary material biconditional) to fail, and this is hard to see.[13] Better yet, with Werner (2020) there exists a contingentist proposal for a reduction of necessity to essence according to which the necessity of essence claims (and thus arguably of the corresponding generalized identities as well) can be preserved despite higher order (sentential) contingency.

7 Note that the system of Correia and Skiles (2017) also includes the reflexivity of generalized identity for any p as an axiom.

8 The principle is: If $p \equiv q$ and ϕ, then $\phi[p//q]$. (For simplicity's sake, I have changed the order of p and q in the consequent, nothing seems to hang in this.)

9 Note: (1) While some admit of an existence predicate that is not defined in terms of quantification and identity only, I know of no analogous approach within the setting of (sentential) higher order quantification. (2) It is a matter of contention whether higher order quantification should be understood as a sui generis kind of quantification or whether it ultimately gives rise or is reducible to objectual, first order quantifications. For present purposes, we can set aside these matters.

10 Here, necessitism is this thesis: $\Box\forall p\Box\exists q(p \equiv q)$. In (approximate) first order terms: Necessarily, every proposition necessarily exists.

11 We could alternatively assume that $P \vee \neg P$ holds in every world and derive from this that $\exists p((p \vee \neg p) \wedge P \equiv p)$.

12 Cf. Werner (2020).

13 One idea might be this: According to (sentential) higher order contingentism, at some worlds, certain differences in the space of possibilities do not exist – this appears to be a gloss on what it means for a proposition not to exist. But this gloss suggests that generalized identities should be contingent as well: It seems that at a world where it cannot be distinguished between P being the case or it not being the case, there is nothing that it is for P to be the case (unless perhaps at such a world, what it is for P to be the case just is for $\neg P$ to be the case). Cf. Fritz and Goodman (2016: p. 645).

Given that the only reason to doubt the necessity of generalized self-identity stems from higher-order contingentism, and given the fact that higher-order contingentism appears to be comaptible with the necessity of essence (and, by extension, arguably with the necessity of generalized identity), and moreover assuming the reductive success of the theory, the strength of Leech's (epistemic) challenge appears to be significantly diminished. But suppose that she adopts higher order contingentism and insists that essences and generalized identities are contingent (perhaps motivated by something like footnote 13). The following (tentative) proposal serves to suggest that even then, all need not be lost for ETM:

For simplicity's sake, we will first consider essence claims expressed using the usual essence operator instead of generalized identities. Consider the a conditional of the following form ("E" expresssing existence): $E[xx] \rightarrow \Box_{xx}\phi$. Given such a conditional, it is highly plausible that it is necessary that $E[xx] \rightarrow \phi$. Now, the proposal is to let the former conditional ground the latter:

$$(E[xx] \rightarrow \Box_{xx}\phi) < \Box(E[xx] \rightarrow \phi)$$

Since it is highly plausible that the former conditional is necessary, even assuming that $\Box_{xx}\phi$ is contingent, Leech's condition on the grounds of necessities seems to be met. So, let's assume $\Box(E[xx] \rightarrow \Box_{xx}\phi)$. Of course, we will need an essential claim to ground this necessity as well, but this is not a problem, we can ground it using the same idea (and the plausible assumption that the essence operator iterates in this case):[14]

$$(E[xx] \rightarrow \Box_{xx}\Box_{xx}\phi) < \Box(E[xx] \rightarrow \Box_{xx}\phi)$$

A corresponding proposal can be made for factual essence (we use generalized identity to capture factual existence and consider the case of a single proposition P):

$$(\exists p(P \equiv p) \rightarrow \Box_P\phi) < \Box(\exists p(P \equiv p) \rightarrow \phi)$$

Note that the former conditional's necessity is highly plausible on its own, but also given Correia and Skiles (2017) and what we have said sofar: If all factual essences concerning Preduce to generalized identities concerning P, and the only way for these to fail is for $[P]$ not to exist (i.e. for $P \equiv P$ to fail), then the necessity of the conditional appears to follow. Finally, it is also plausible that the necessity of the former conditional can be grounded as above:

$$(\exists p(P \equiv p) \rightarrow \Box_P\Box_P\phi) < \Box(\exists p(P \equiv p) \rightarrow \Box_P\phi)$$

Clearly, this proposal would require require further development (for example, does it capture all required necessities, and if not, can it be extended accordingly?). But in what follows, I want to focus on an explanatory problem for ETM based on Correia and Skiles (2017), an instance of which we can already find in this proposal: What generalized identities are iterated (factual) essence claims reduced to or grounded in? For example, consider $\Box_P\Box_P(P \leftrightarrow P)$. It is plausible that the

[14] Why not have the conditional ground its own necessity? Because this is less principled and might be explanatorily problematic, see below!

inner essence claim $\Box_P(P \leftrightarrow P)$ reduces to $\Box_P(P \equiv P)$. But what generalized identity does this claim reduce to?

3 An explanatory challenge?

Curiously, after having offered her argument for the necessity of generalized identity on the basis of the Leibnizian principle and the necessity of generalized self-identity, Leech (2020: p. 16) argues that "one should not appeal to the essence of anything to account for [the necessity of generalized self-identity]". She then considers that one might take (as Correia and Skiles do) the generalized self-identities like $P \equiv P$ to be logical theorems and hence to be logically necessary. Leech then asks what the source of the semantic constraints on $\equiv$ responsible for these logical theorems is and what the link between logical theoremhood and necessity is. According to her, these questions give rise to a dilemma that arises *even if we accept the correctness of the logic*: Either essence is not involved, but then not all necessities have their source in essence, or essence is involved, but then the account given is objectionably circular.

If we understand Leech's challenge as an epistemic one, this is hard to make sense of: The proposal that generalized self-identities are logical theorems could perhaps address that challenge by suggesting that we should believe generalized self-identities on the same basis on which we believe (basic?) logical truths (whatever that may be). But this idea is plainly compatible with the idea that logical theorems, the relevant semantic constraints, or the necessary status of logical theorems have their source in essence – given the *epistemic* challenge, there just does not arise any objectionable circularity here.

But perhaps the theory is confronted with a distinct explanatory (or grounding-) problem. Since according to it, generalized identities such as $P \equiv P$ are necessary, it needs to supply grounds for the corresponding necessities, e.g. $\Box(P \equiv P)$. The problem is that it might be hard to see what generalized identities could ground these necessities. Correia and Skiles do not (in their article at least) defend ETM, but they offer two principles that link generalized identity and modality:

(8) If $F_x \equiv_x G_x$, then $\Box\forall x\Box(Fx \text{ iff } Gx)$

(9) If $p \equiv q$, then $\Box(p \text{ iff } q)$

If we assign generalized identities as grounds to necessities, it seems plausbile to mirror these principles as follows:

(8<) If $F_x \equiv_x G_x$, then $(F_x \equiv_x G_x) < \Box\forall x\Box(Fx \text{ iff } Gx)$

(9<) If $p \equiv q$, then $(p \equiv q) < \Box(p \text{ iff } q)$

But these two principles do at least not obviously supply us with grounds for $\Box(P \equiv P)$! So, at best, the theory is incomplete, at worst, it cannot provide the required grounds. Note that there is a more general problem here: The theory has trouble accounting for brute necessities that are not of a conditional form (broadly construed), but the present problem is particularly pressing because

$\Box(P \equiv P)$ is required by the theory itself. The question from the end of the previous section gives rise to a related issue: How should generalized identities prefixed with an essence operator such as $\Box_P(P \equiv P)$ be understood in terms of generalized identity?

One possible answer that comes to mind is to let generalized identities ground *their own* necessity (and analogous for essentiality):

($\equiv$ grounds $\Box$ $\equiv$) If $P \equiv Q$, then $(P \equiv Q) < \Box(P \equiv Q)$

But there is some reason to believe that $P \equiv Q$ cannot fully ground $\Box(P \text{ iff } Q)$ because the resulting grounding claim may appear to be explanatory deficient: The grounding claim cannot be an instance of a general explanatory schema of the form "$\phi < \Box\phi$" – lest every proposition be necessary, this schema has false instances. But it is plausible that claims of full grounds must correspond to general schemata like this.

This is a plausible related case: If Fa fully grounds Ga, then for any x, if Fx, then $Fx < Gx$. For if there were an entity b such that Fb but not Gb, then it appears that Fa cannot fully ground/explain a's being G, after all, b's being F does not suffice for its being G.[15] From this it follows that if [P]'s being the case grounds [P]'s being necessarily the case, then for every proposition, its being the case grounds its necessarily being the case. This though is incompatible with the existence of contingent propositions. While it is doubtful that a "semantic descent" like this is in general permissible (this would at least require substantial argument), it may seem plausible in this case.

But there is a problem for this train of thought: There are instances of the schema "$\phi < \Box\phi$" which (at least prima facie) seem explanatorily acceptable, for example: $\Box P < \Box\Box P$ (an analogous instance arises involving essence operators). This claim corresponds to an (seeminlgy) unproblematic general grounding schema, namely $\Box\phi < \Box\Box\phi$. Now, it's easy enough to come up with analoguously restricted (albeit perhaps less principled) schemata for the case above, for example "ϕ's being (generalized) self-identical grounds its being necessarily (generalized) self-identical".

Still, the proposal remains somewhat mysterious in a way that the grounding of iterated box-claims is not: How exactly does the identity ground its own necessity? Without something of an answer here, it is unclear what would differentiate the identity-claim from other necessary propositions with respect to their propensity to ground their own necessity. But then why not let *all*necessary propositions fully ground their own necessity as well?[16] We can arguably characterize at least some of them (e.g. the identities and the logical necessities) without modal material, so general grounding principles that do not presuppose their necessity seem possible. This idea may be attractive to some, or perhaps a rationale can be found for why this generalized approach is impossible, but I submit that there lurks a potential problem here.

In any case, I now show how it might be avoided: Correia and Skiles do not only account for essences in terms of generalized identity, but also for grounding. Moreover, De Rizzo (2020) has proposed that necessities might be grounded in grounding claims – in particular, he proposes that some necessities might be grounded in *zero-grounding* claims.

15 This is an instance of what deRossett (2013) calls the "determination constraint".

16 More specifically, why not for all necessary [P], [P] fully grounds [$\Box P$]?

A quick note on zero-grounding: Normally, grounding is taken to be (at least something approximately like) a relation between a plurality of propositions or facts, the *grounds*, and a single proposition or fact, the *grounded* proposition/fact or *groundee*. Zero-grounding is a limiting case of grounding in which the set of grounds is empty. A zero-grounded proposition or fact is grounded and not ungrounded, but it does not require any propositions or facts to ground it – it is grounded in zero propositions/facts. More precisely, if we assume grounding statements to have the form '$\Gamma < P$', then since in the case of zero-grounding statements, the 'Γ' stands for an empty plurality of grounds, statements of zero-grounding have the form '$< P$'.[17]

So, the idea is that if $< P$, then $(< P) < \Box P$. In particular, $[\Box(P \equiv P)]$ will be grounded in $[< (P \equiv P)]$. The resulting account is unified in that all necessities will be grounded in generalized identities, but some of these necessities will be grounded in generalized identities via zero-grounding claims. For this to work, the proposal of Correia and Skiles (2017) has to be able to capture zero-grounding claims. In general, the proposal (p. 14) defines grounding as follows:

> "a collection of facts $p_1, p_2, \ldots$ grounds another fact q iff conjoining $p_1, p_2, \ldots$ gives you a disjunctive part of q (thus each of $p_1, p_2, \ldots$ is a conjunctive part of a disjunctive part of q), yet there's *no* way of conjoining facts with q that gives you a disjunctive part of *any* of $p_1, p_2, \ldots$ (thus q is *not* a conjunctive part of *any* disjunctive part of the facts in that collection). In symbols:
>
> **FACTUAL-GROUNDING** $p_1, p_2, \ldots < q$ iff: (i) $p_1 \wedge p_2 \wedge \ldots \sqsubseteq^{\vee} q$; and (ii) neither $q \sqsubseteq^{\wedge\vee} p_1$, nor $q \sqsubseteq^{\wedge\vee} p_2$, nor ..."

To capture zero-grounding, we allow that the plurality of grounding facts $p_1, p_2, \ldots$ be empty (i.e. we allow the grounding facts to be none). Allowing furthermore the conjunction in (i) to conjoin the empty set of propositions, zero-grounding is captured as follows:

FACTUAL-ZERO-GROUNDING $< q$ iff: (i) $\bigwedge \emptyset \sqsubseteq^{\vee} q$; and (ii) for no p in $\emptyset$: $q \sqsubseteq^{\wedge\vee} p$

Since condition (ii) is trivially satisfied (there are no facts in the empty set of facts), a fact q's being zero grounded (according to this definition) amounts to the empty conjunction being a disjunctive part of q. According to Correia and Skiles, we can understand the notion of disjunctive part in terms of generalized identity as follows: p is a disjunctive part of q iff for some r, for q to hold is for $p \vee r$ to hold. So, a fact q is zero-grounded iff there is an r such that $q \equiv \bigwedge \emptyset \vee r$.

Accordingly, for the proposal to work, for any generalized self-identity $p \equiv p$ an r has to be found such that $(p \equiv p) \equiv \bigwedge \emptyset \vee r$. Note here that according to Correia's and Skiles' (2017, p. 6) assumptions about generalized identity, for q to hold is for $q \vee q$ to hold ($q \equiv (q \vee q)$), and from $p \equiv q$ we can infer $q \equiv p$, so if we choose the empty conjunction itself for r, then what it is for $p \equiv p$ to be the case is for the empty conjunction to be the case.

[17] The notion of zero-ground has been introduced by Fine (2012: 47f.), who argues for instances of zero-grounding by applying principles of the logic of ground to certain edge cases. A prominent application of the notion is Litland's (2017) account of the grounds of ground, according to which certain grounding claims are zero-grounded. For further applications of the notion see Muñoz (2020) on non-existence and Kappes (2020) on logical theorems.

This solution commits the identity theorist to use the notion of zero grounding. I do not consider this to be a problem, the theory even makes room for the idea. But the required identity-claims may be troublesome. At least, they do not seem particularly intuitive: It is not straightforward to see what what it is for a generalized self-identity $P \equiv P$ to be the case has to do with what it is for the empty-conjunction to be the case![18]

It can perhaps be responded that the notion of generalized identity in play here is *worldly* and thus insensitive to mere representational differences that are responsible for this intuitive problem.[19] In particular, zero-grounded claims are insubstantial as to their worldly content, they demand nothing of the world. The empty conjunction is like this, but according to the proposal, generalized self-identities such as $P \equiv P$ are like this as well: They demand nothing of the world. Hence, their worldly demand is the same – the worldly aspect of what it is for them to be the case is the same. Here, one would perhaps like to say that what it is for them to be the case is *nothing*, but note that it is not obvious how this can be made sense of, within or without the framework of Correia and Skiles (2017).

Let us briefly think about the proposal. One might perhaps suspect that the original spirit of the reduction of necessity to *essence* has been lost: If we take De Rizzo's proposal on board, is only grounding, but no essence required? Not so: What's relevant is that the proposal would afford a grounding of necessity in terms of generalized identity (in part via the detour through zero-grounding) and according to Correia and Skiles (2017), claims about generalized identity just are claims about (factual) essence!

Finally, an uneasiness remains that the proposal would amount to cheating, for consider that according to one of the versions of the proposal considered above, $\Box(P \equiv P)$ is partially grounded in $(P \equiv P) \equiv \bigwedge \emptyset$. One might complain here as follows: What we set out to find was an explanation of the necessity of $P \equiv P$, but all we ultimately got (albeit hidden below a layer of zero-ground) is a strong type of equivalence of $P \equiv P$ with the empty conjunction. One might think that this explanation is only as good as the explanation that we have for the necessity of the empty conjunction.[20] But according to the proposal, the necessity of the empty conjunction is presumably also grounded in the empty conjunction's being zero-grounded, which again amounts in part to the generalized identity of the empty conjunction with itself, giving rise to the suspicion that its necessity has not been sufficiently explained. While the letter of ETM is fulfilled, the spirit of the reduction may thus not be.

I do not know whether (something like) this (potential) explanatory problem was what Leech had in mind (despite her presentation pointing into another, epistemic, direction), but it would fit well to her insisting that the necessity of $P \equiv P$ be ultimately accounted for without employing generalized identities. To recap, this potential problem relies first on the assumption that the necessity of (e.g.) a generalized self-identity must be zero-grounded (and cannot, e.g., be fully

[18] Note that this problem does not depend on a particular choice for r, it already arises from the fact that according to the proposal, there is an r such that $(P \equiv P) \equiv \bigwedge \emptyset \vee r$.

[19] Correia and Skiles (2017: p. 4).

[20] According to the proposal, this partial ground constitutes a full ground of $\Box(P \equiv P)$ together with [For no p in $\emptyset$: $(P \equiv P) \sqsubseteq^{\wedge\vee} p$], this corresponds to clause (ii) of **FACTUAL-ZERO-GROUNDING**. For the problem of this paragraph, this does not appear to make a difference.

grounded in the relevant generalized self-identity itself), and second on the thought of the previous paragraph, namely that the explanation of the necessity of P in terms of P's being zero-grounded can (given the theory of grounding in Correia and Skiles (2017)) only be as good as the explanation of the necessity of the empty conjunction, for which no other explanation than its being zero-grounded in the very same fashion has been offered.

Whether this is a genuine problem and if so, how it might be addressed, is material for a another occasion.

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