



Is generalised identity a basis for essence and grounding?

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Abstract

This paper examines what role generalised or higher-order identity can and should play in the context of essence and grounding. Emphasising important analogies to ordinary identity, I will speak of quasi-identity. While many philosophers embrace essence and grounding as primitive notions, F. Correia and A. Skiles offer an analysis in terms of identifications linking sentences and open formulas instead of singular terms. Their basic idea is to construe an essential feature as a conjunctive part and a ground as a disjunctive part of the target item. This paper focuses on grounding. First, in the *ingredient argument*, I assume that the determinative and explanatory character of grounding comes with an inherent and non-trivial necessitating force and argue that quasi-identity is a poor candidate ingredient in an analysis of grounding, because it lacks any sign of such a force. For an alleged *de dicto* necessitation principle for quasi-identity is dubitable and, in any case, fails to represent an inherent necessitating force. And a *de re* necessitating force that might be attributed to quasi-identity blatantly fails to be non-trivial. Secondly, in the *arrangement argument*, I argue that grounding cannot be gained from a subtle arrangement of quasi-identity and truth-functions, because to understand when the arrangement applies and when it does not one already needs a grounding-like notion. Two constructive insights are suggested. First, grounding relations in the general sense are generated by chaining specific grounding operations, of which conjoining and disjoining are only examples. Secondly, quasi-identity is not part of a generation mechanism for grounding but serves as an important transport mechanism for grounding from transparent to opaque cases.

Keywords Essence · Grounding · Higher-order identity · Generalised identity · Necessity · Determination · Explanation

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1 Introduction

In the last two decades, large parts of analytic metaphysics have undergone a paradigm change from a modal to a post-modal framework. Alongside fundamentality (prominently championed by Sider, 2020), the two central notions of the new framework are (neo-Aristotelian) essence and grounding. The intactness, usefulness, nature, and interrelation of the two notions is still contested, though (see Williamson, 2024 for a modalist counterstrike). Help might be expected from another recent trend. In the last decade, philosophers have resorted to higher-order languages to solve traditional problems in metaphysics (Fritz & Jones, 2024), but also to understand core post-modal notions (see Dorr, 2016: 79–84 on metaphysical priority and Bacon, 2020 on fundamentality).

This paper focuses on a critical examination of F. Correia's and A. Skiles's (2019, 2022) analysis of essence and grounding based on a notion of higher-order or "generalised" identity. Initially, their proposal seems highly attractive. For it promises understanding core notions of post-modal metaphysics in terms of purely logical notions: some truth-functions combined with higher-order identity (and higher-order quantification). I will argue, however, that the proposed analysis faces fundamental difficulties that motivate a different approach to the post-modal notions.

My ambition in this critical examination is not to refute Correia's and Skiles's identity-based analyses. Refutations in philosophy are rare, if there are any. My objective is thoroughly constructive. I assume that we wish to understand essence and grounding, so that we can use those post-modal tools for first-order metaphysics. To this end, we ought to consider various extant accounts of those notions and try to draw important insights from them to approach an understanding of the post-modal framework, even if one finds reasons not to embrace any existing view in full. Also, as any critical examination, the one in this paper proceeds from a certain home position. As I will explain in Sect. 2, my basic position regarding essence and grounding is moderately conservative: both notions are determinative and explanatory in character, and this involves their having a built-in necessitating force (cf. Fine, 2015). My critique can be evaded by denying essence and grounding a determinative, explanatory, and necessitating character. My suspicion would then be, however, that we are no longer talking about the same notions we started with some twenty years ago. We would lose sight of the very concepts that we had convinced ourselves were indispensable to metaphysics.

Correia and Skiles base their analyses of essence and grounding on higher-order identity. I will speak of "quasi-identity", not to devalue the notion as only being one of *ersatz* or pseudo-identity (quite the contrary!), but because some other "quasi" notions will play a role in the critical argument. Focusing on grounding, the critical investigation falls into two parts. The *ingredient argument* (Sects. 5, 6, 7) questions that quasi-identity is a suitable ingredient in an analysis of grounding, because it cannot contribute one bit to the determinative-explanatory and hence necessitating character of grounding. The *arrangement argument* (Sect. 8) turns against the idea that grounding can be analysed by cleverly arranging quasi-identity and truth-functions such as disjunction and conjunction, as the proposed analysis suggests; the

reason is that to properly understand the proposed arrangement, one already needs to understand a grounding-like notion.

My diagnosis and constructive suggestion (Sect. 9) can be summarised as follows: quasi-identity is not part of a generation mechanism for grounding relations; instead, grounding relations in general are generated by chaining specific grounding operations, of which disjoining and conjoining are but examples; quasi-identity plays an important role nevertheless as a transport mechanism for grounding from transparent to opaque cases.

Section 2 introduces the moderately conservative home position regarding essence and grounding. Section 3 explains the identity-based analysis of both notions. Section 4 explains the overall strategy of the critical examination. Section 5 presents preliminaries for the ingredient argument, highlighting what will be called the quasi-extensionality of quasi-identification. Section 6 presents the first part of the ingredient argument: a *de dicto* necessitation principle claimed by Correia and Skiles is questionable and, in any case, fails to represent an inherent necessitating force of quasi-identity. Section 7 presents the second part: a *de re* necessitating force that may be attributed to quasi-identity blatantly fails to be non-trivial. Section 8 presents the arrangement argument: grounding is not successfully analysed by cleverly arranging quasi-identity and truth-functions. Section 9 highlights the main insights I wish to draw from the critical examination for a constructive program of understanding grounding as well as essence. Section 10 concludes.

2 Moderately conservative basics on essence and grounding

A critical examination of a proposed analysis of essence and grounding cannot presuppose some other specific construal of those notions. It nevertheless requires a preconception against which the analysis can be tested. As announced in the introduction, the following basics are formulated from the vantage point of a moderately conservative post-modal metaphysician. I have in mind a philosopher that first adhered to the modal paradigm of the 1970s to the (early) 1990s, represented by philosophers as diverse as S. Kripke and D. Lewis, and later converted to post-modalism. Such a philosopher understands essence and grounding not as completely new notions. Instead, she understands them as improved successor notions of earlier modal tools that are better suited to perform the task the latter were expected to fulfil. This crucially includes the determinative, explanatory, and necessitating character of essence and grounding alluded to in the introduction.

For reasons that will emerge shortly, I will mostly focus on grounding in this paper. An important modal predecessor to grounding is strong supervenience. Supervenience requires that the truth and falsity of one kind of proposition is always necessitated by the truth or falsity of another kind of proposition, in the strict or metaphysical sense of necessity. The thought was that strong supervenience captured the metaphysical determination of derivative facts by more basic facts. Where

the supervenience was cognisable apriori,¹ it was thought to amount to metaphysical explanation. For example, an “explanatory gap” was diagnosed because the assumed strong supervenience of a subject’s qualia on her brain states did not seem to hold apriori (Levine, 1993).

However, strong supervenience failed to do justice to the plausible asymmetry of metaphysical determination and explanation. A body’s density supervenes on its mass and volume; but contrariwise, its mass also supervenes on its density and volume (Fine, 2001: 11). This is one of the problems that convinced the ex-modalist that a more fine-grained conceptual tool was needed to capture metaphysical determination and explanation. Grounding was the natural candidate. Yet the ex-modalist remained conservative by understanding grounding as a refinement of the earlier modal tool. If anything, the idea was to further tighten the necessitating link between determining and determined items, not to relax it. This means that the relation between grounds and groundee must be at least as strong as that between subvening and supervening facts. Grounds at least need to metaphysically entail the groundee.

A paradigmatic grounding claim would be that *It is raining, It is freezing* jointly ground (*It is raining and it is freezing*).² Following Fine (2012) as well as Correia and Skiles (2019), I assume that in such a paradigmatic case, grounding is not a relation between facts. Instead, it is a higher-order relation between sentential contents³ and is expressed by an operator that takes a plurality of sentences on the left and a single sentence on the right to form a sentence. For convenience, I will nevertheless sometimes speak as if grounding related a plurality of facts, the grounds, to a single fact, the groundee.

The original approach was to assume grounding to be factive, i.e., to entail the truth of the related sentential contents (e.g., Fine, 2012). However, in their attempted unified accounts of essence and grounding, Fine (2015) as well as Correia and Skiles understand grounding as neutral regarding the truth of the relata. In the following, I will adopt this non-factive construal. I will nevertheless sometimes speak of grounding as relating (potential) facts to (potential) facts.⁴

As explained above, it is part of the birth certificate of the notion of grounding that it is a notion of specifically metaphysical determination (or dependence, see Rosen, 2010) and that grounding is firmly tied to a specifically metaphysical form of explanation (Fine, 2012: 38). Clearly, *It is raining* and *It is freezing* do not cause

¹ In Jackson-Lewis 2D semantics, apriority is a modality: necessity of the primary intension.

² I believe that McSweeney’s (2020) attack on this “logical” paradigm for grounding can be answered.

³ “Sentential content” is a term for what non-substitutional quantification into sentential positions quantifies over, as in “ $\exists p$: Ann believes that p ”. I reserve “proposition” for the abstract entities denoted by nominalisations such as “the proposition that p ”. I assume that truth makes sense both as a property of propositions and as a higher-order property of sentential contents, expressible as “It is true that...”.

⁴ I remain neutral on the question which notion is basic. Non-factive grounding could be explained based on the factive notion, for example by saying that p non-factively grounds q just in case p would ground q if it were a truth (Fine 2012: 50). Alternatively, non-factive grounding could be taken as basic and factive grounding be defined by additionally requiring true relata. This latter view suggests itself if grounding is introduced as a refinement of strict entailment. For logical, conceptual, and metaphysical entailment is standardly understood to be non-factive.

their conjunction. They determine it in a tighter, non-causal way: the link between the ground(s) and the groundee is independent of causal or natural laws in such a way that it typically makes sense to say that the groundee *consists in* (nothing over and above) the ground(s) (cf. Fine, 2012: 39). By assuming determination to be characteristic of grounding, the focus in the following will be on full grounding (for full vs partial grounding, see Fine, 2012: 50). Also, we can non-causally explain why it is that *It is raining and it is freezing* by pointing both to the fact that it is raining and to the fact that it is freezing. The determinative and explanatory character suggests that the central notion is one of strict grounding, which is asymmetric and *a fortiori* irreflexive.⁵

For Fine and other “unionists” or adherents of the “identity view”, grounding just is a perfectly gapless form of explanation (2012: 39). For “separatists”, the determinative or productive character of grounding is basic. On the latter view, metaphysical explanations only “track” grounding relations or are “backed” by them, just as causal explanations track relations of causation. We can be neutral with regards to a possible priority of one of the two aspects of determination and explanation over the other and with regards to the identity and the tracking view. (For an informative overview, see Glazier, 2020.) I will assume that even for separatists grounding is connected to explanation so tightly that it is apt to say that grounding is explanatory in character.

As explained, the moderately conservative philosopher takes the metaphysically determinative and explanatory character of grounding to entail a necessitating force of the relation. What is more, she does not think of the metaphysical entailment of the groundee by the grounds as an add-on to the explanatory determination. Instead, the determination *is* a fine-grained form of necessitation. The two truths p, q necessitate $(p \wedge q)$ in a determining way. By being inherently determinative, grounding is also inherently necessitating. Counterexamples have however been presented that call the general necessitating force of grounding into question (Leuenberger, 2014; Skiles, 2015). For our purposes, it will suffice to assume grounding to be necessitating in paradigmatic cases. My personal view, however, is that it would be “overfitting” (Williamson, 2024) to give up the general necessitating force of grounding in view of some highly special, complex, and even artificial examples. It is much more likely that something has gone wrong with the construction of the examples or the background understanding of grounding than that grounding sometimes fails to necessitate. For the ex-modalist philosopher at least, necessitation is just too central to the notion of grounding she came to embrace to be negotiable.

That a grounding operator links complete sentences is the paradigm case. However, grounding also seems to make sense in a generic way. Grounding can link predicables⁶ expressed by predicates or open formulas. For example, we can say that

⁵ For metaphysical coherentists (Thompson 2018), grounding can hold symmetrically or even is symmetric. Rodriguez-Pereyra (2015: 525–528) argues against irreflexivity. For a critical study see Busse (2025).

⁶ “Predicable” (cf. Fine 2015: 298) is a term for what non-substitutional quantification into predicate positions (as in “ $\exists F: Fa \wedge Fb$ ” or “ $\exists R: Rab \wedge Rba$ ”) quantifies over. Monadic and relational predicables are to be distinguished from properties and relations, which are the referents of abstract singular terms such as “redness” or “the relation of being one meter apart”.

the three features of being a man, unmarried, and marriageable generically ground being a bachelor. Such a generic grounding fact can be formalised using a variable-binding operator: (x is a man, x is unmarried, x is marriageable) ground _{x} x is a bachelor.⁷ Both Fine (2015) and Correia and Skiles (2019) embrace generic grounding (as well as generic essence, see below).

In concert with Correia and Skiles (2019: 656), I will assume that we are only concerned with “worldly” as opposed to “representational” grounding. This means that the grounding locution in play links sentential contents and predicables irrespective of how, by what concepts or in what representational guises, they are expressed. Worldly grounding is insensitive to concepts or guises, while representational grounding is sensitive to them. For example, on a typical view, p grounds $\neg p$ representationally but not worldly. For the typical stand is that p and $\neg p$ are one and the same worldly content, and no content worldly grounds itself. (See Correia, 2017: 58.) However, the worldly/representational contrast is orthogonal to the coarse-grained/fine-grained distinction (Correia, 2020). In principle, someone may assume worldly contents to be so fine-grained that p worldly grounds the *different* content $\neg p$ after all (cf. the “structuralist” position discussed in Dorr, 2016: 58–66). And in principle, concepts could be construed as rather coarse-grained.

Regarding essence, the ex-adherent of the 1970s-to-’90s modal paradigm used to understand facts of essence as *de re* necessities, such as that Socrates is necessarily human. However, if Socrates is necessarily human, he is also necessarily a member of the set of humans. Yet membership in a set does not seem to be part of Socrates’s essence. Examples like this (Fine, 1994) convinced the ex-modalist that a more fine-grained notion of neo-Aristotelian essence had to be embraced.

The characteristic profile of essence is more complicated than that of grounding. It is plausible that an essential feature (human) is partly determinative of the target object (Socrates): humanity helps to determine what Socrates is. Also, the feature helps to explain what Socrates is. (Fine, 2015: 296–297) As with grounding, the conservative post-modalist understands the essentiality relation between an object and an essential feature of it as a refinement of the fact that the object has that feature necessarily. If anything, essentiality is a tighter bond than *de re* necessity and not a relaxation. This view is nicely represented by Fine’s (1995, 2015: 297–298) standard expression for essentiality, which only adds an index for the source of the necessity to the usual necessity operator, as in “ $\Box_{\text{Socrates}}$ Socrates is human”. However, determination and explanation, on the one hand, and necessitation, on the other, now run in opposite directions. The essential feature helps determine and explain the target; but the target necessitates its feature. (Cf. Fine, 2015: 300.) This complication is one main reason for focusing on grounding in what follows. We must nevertheless be able to understand how essence is dealt with in the identity-based analysis.

Objectual essentiality links items of different categories: an object is linked to one of its features, or to the fact of the object having that feature. In the first instance, Correia’s and Skiles’s analysis concerns two forms of category-internal essentiality.

⁷ Alternatively, a fact of generic grounding can be stated using lambda abstraction: $\lambda x(x \text{ is a man}), \lambda x(x \text{ is unmarried}), \lambda x(x \text{ is marriageable})$ jointly ground $\lambda x(x \text{ is a bachelor})$. This notation is closer to the informal talk of a generic grounding relation between predicables. I therefore like it better, personally.

First, essence also makes sense as a relation between potential facts or truths. For example, it seems to be factually essential to *It is raining and it is freezing* that it is raining. Secondly, essence makes sense as relations between predicables. For example, it is generically essential to being a bachelor to be unmarried. As with generic grounding, this can be formalised using a variable-binding operator: it is part of the essence_{*x*} of *x*'s being a bachelor that *x* is unmarried.⁸ In sum, we have both factual and generic notions of both essence and grounding. Correia and Skiles (2019: 650; see also their reply to Leech, 2021, 2022: 1283) suggest that objectual essence reduces to generic essence. For example, having Socrates as a member is essential to {Socrates, Plato}. The analysis of this fact is that it is generically essential to being (identical to) {Socrates, Plato} to have Socrates as a member (for a similar proposal see Fine, 2015: Sect. 1).

It may finally be noted that the notion of essence we have been considering is one of partial essence: of one item contributing to the determination and explanation of what another item is. A target's full essence, by contrast, would exhaust what that item is. For example, we might say that being male, unmarried, and marriageable does not only fully ground being a bachelor but capture in full what bachelorhood is. Yet another issue is individuation. It is not clear that even full essence must be individuating. For example, *i* and *-i* in the complex numbers plane seem to have the same full mathematical essence (say, being a square root of -1) but are nevertheless two different numbers.⁹

3 Quasi-identity and the identity approach to essence and grounding

Correia and Skiles base their analyses of essence and grounding on two variants of quasi-identity. Their symbol " $\equiv$ " for what they call generalised identity links expressions from other categories than that of singulars terms. Yet they conceive of the relation by "tight analogies" (2019: 665) with ordinary objectual identity. As remarked in the introduction, I speak of quasi-identity to emphasise the continuity with ordinary identity. This terminology also allows for a convenient locution of one item being quasi-identical to a second.

In a statement of objectual identity " $a=b$ ", we identify the referents of the two singular terms on the left and on the right with each other. Similarly, in a statement of factual identity " $p \equiv q$ ", we identify the sentential contents expressed on the two sides with each other. For example, we can say that for Ben to be a bachelor is for him to be a man, unmarried, and marriageable. This may be rephrased by saying that Ben's being a bachelor is factually identical to his being a man, unmarried, and

⁸ As with grounding, a notation using lambda abstraction may be preferred: $\lambda x(x \text{ is unmarried})$ is essential to $\lambda x(x \text{ is a bachelor})$.

⁹ However, it could be held that the basic essence of *i* and *-i* is collective, reciprocal or relational (see Fine 1995: 65–66): being the two solutions of $x^2 = -1$. This relational essence could individuate the two numbers in package.

marriageable. We may loosely speak of an identification of facts, and hence of a relation of factual identity. We only need to keep in mind that we are not concerned with an objectual identification of facts in the sense of abstract entities referred to by singular terms. Nor need the contents be truths. Quasi-identity is non-factive, holding equally between true and false contents.

For the simplest, monadic case, a statement of generic identity is of the form “ $\Phi(x) \equiv_x \Psi(x)$ ”¹⁰: the variable-binding operator “ $\equiv_x$ ” links two open formulas. We thereby identify the conditions or predicables expressed by the two formulas on the left and on the right with each other. We can say in a generic fashion, for example, that to be a bachelor just is to be a man, unmarried, and marriageable. This can be rephrased by saying that being a bachelor is generically identical to being a man, unmarried, and marriageable.

The authors ensure the analogy to objectual identity mainly by reproducing the usual formal constraints of identity: quasi-identity is a higher-order equivalence relation that is governed by a variant of Leibniz’s law. Thus, $p \equiv p$ for arbitrary p (reflexivity); if $p \equiv q$, then $q \equiv p$ (symmetry); if $p \equiv q$ and $q \equiv r$, then $p \equiv r$ (transitivity); and for a wide range of higher-order conditions C , if C holds of p and $p \equiv q$, then C also holds of q ; similarly for generic identity (Correia & Skiles, 2019: 645).

Though my focus will be on grounding, we may begin with the proposed analysis of essence, which is simpler. Since Correia and Skiles embrace reflexive and symmetric facts of essence, no measures need to be taken to exclude cycles. According to them, the relation of full essence just is quasi-identity (2019: 649–651). For example, being a bachelor is generically identical to being a man, unmarried, and marriageable, and this identity reveals the full essence of bachelorhood.

Essence in general is analysed as a conjunctive form of parthood. For example, the fact that being unmarried is essential to being a bachelor is analysed as follows: being a bachelor is generically identical to being unmarried *and something*. The suitable *something* is being male and marriageable. Formally, we have $\text{Bachelor}(x) \equiv_x \text{Unmarried}(x) \wedge X(x)$, for some additional characteristic X . (However, X need not be a non-trivial complement characteristic. For example, being human can be essential to being Socrates, in that being Socrates is generically identical to being human and *being Socrates*.)

Regarding grounding, the basic idea is to analyse it in a parallel manner, but by disjunctive instead of conjunctive parthood. For example, the fact that being red grounds being coloured requires the following: being coloured is generically identical to being red *or something*. The suitable *something* would be being yellow or green or blue etc. Formally, the requirement is $\text{Coloured}(x) \equiv_x \text{Red}(x) \vee X(x)$ for some predicable X . However, other than with essence, Correia and Skiles wish to maintain the irreflexivity and asymmetry of grounding. They therefore need to exclude cyclic chains of partial identities. The approach is to say that where $F(x) \equiv_x G(x) \vee X(x)$, being G is a ground of being F just in case F is not in turn a logical part of G , i.e., does not feature in a logical complex that is generically identical to G (2019: 655).

¹⁰ For convenience, I use ordinary quotation marks for quasi-quotation.

The analyses of factual essence and grounding parallel those for the generic case in obvious ways: q is essential to p just in case $p \equiv q \wedge \text{something}$; and q grounds p just in case $p \equiv q \vee \text{something}$, where p is not in turn a logical part of q , i.e., does not feature in a logical complex factually identical to q . The authors also allow for collections of facts $p_1, p_2, \dots$ to jointly ground a fact q (2019: 655). For joint grounding they require that each of the $p_1, p_2, \dots$ is a conjunctive part of a disjunctive part of q . By this they mean that q is quasi-identical to a disjunction $(p_1 \wedge p_2 \wedge \dots) \vee \text{something}$ of the conjunction of the p_i and *something*. An important application is the joint grounding of a conjunction by its two conjuncts. Two facts p, q can jointly ground $(p \wedge q)$, because their conjunction $(p \wedge q)$ is a disjunctive part of an instance of $(p \wedge q) \vee \text{something}$, viz., $(p \wedge q) \vee (p \wedge q)$, which is quasi-identical to $(p \wedge q)$ by Idempotence ($A \equiv A \vee A$). In addition, it is required that $(p \wedge q)$ does not in turn feature in a logical complex quasi-identical to either p or q .¹¹

4 The strategy of the critical examination

The aim of this section is to outline the main thrust and the general strategy of the critical investigation in Sects. 5, 6, 7, 8. At the beginning of their paper, Correia and Skiles explain that they wish to propose “a unified and uniform account of both notions [i.e., essence and grounding] that analyzes them in terms of [...] generalized identity.” (2019: 642) This suggests, first, that they understand their proposal as a reductive analysis of essence and grounding. Secondly, it suggests that the core ingredient of the analysis, the one that does the main work, is what I call quasi-identity.

First, I will take the suggestion of a reductive analysis seriously. The authors consider different ways of reducing ideology, adopting “the working hypothesis that generic and factual identity are pieces of primitive ideology.” (2019: 648). The natural way to read this is that they intend to conceptually reduce the notions of essence and grounding to notions of quasi-identity. Indeed, they appear to put forward explicit definitions of both notions. (See, however, their remarks on whether real definitions are reductive or not, 2019: 653; see also Correia, 2017.) In addition, the reductive reading of the proposal has two advantages. A more substantive advantage is that a convincing reductive analysis of post-modal tools in purely logical terms (assuming that higher-order logic deserves its name) would be rather attractive. It is therefore important to examine whether such a reductive account can be had. A strategic advantage is that a strong, reductive reading makes it easier to identify problems. Whether the problems also affect a weaker proposal that only seeks to

¹¹ Dorr (2016: 80) defines a more functions-theoretic than identity-theoretic notion of metaphysical priority, or relative fundamentality: for categories other than entities, x is strictly prior to y just in case there is a higher-order function f such that $y \equiv f(\dots, x, \dots)$ while for no function g , $x \equiv g(\dots, y, \dots)$. This is neither a notion of grounding nor of essence. We may assume that *Ann believes that it is raining* results from saturating the function *Ann believes that* by *It is raining*, while *It is raining* does not in turn result from saturating any function by *Ann's attitude*. But *It is raining* neither grounds *Ann's attitude* (though it may cause it), nor is it essential to the attitude.

highlight conceptual connections within a family of notions remains to be seen (see Sect. 8).

Secondly, the main goal of my critical investigation is to show that, far from doing the main work in an analysis of grounding, quasi-identity is not an ingredient in a proper account of the grounding relation at all. Though it does play an important role in the context of grounding, its role is not that of being involved in making it the case that grounding relations obtain.

The critical investigation has two parts, which I call the *ingredient argument* (Sects. 5, 6, 7) and the *arrangement argument* (Sect. 8).

Regarding the ingredient argument, assume a structurally simple instance of factual grounding: p grounds r . According to the identity-theoretic analysis, this grounding relationship requires the fulfilment of a positive and a negative condition: p is a disjunctive part of r ; but r is not in turn a logical part of p . Let us focus on the positive condition. Quasi-identity enters the stage because Correia and Skiles do not accept disjunctive parthood as a primitive relation but seek to analyse it by two purely logical elements, disjunction and quasi-identity. It is therefore natural to think of their analysis as breaking up disjunctive parthood into two consecutive steps: first, p is a disjunct in the disjunction $(p \vee q)$ for some suitable q ; secondly, this disjunction $(p \vee q)$ is quasi-identical to r . Thus, disjunctive parthood is analysed by chaining a step of logical disjoining with a step of quasi-identification. On the identity-view, the relation between p and r defined by chaining the two steps is the positive core of the assumed grounding relation between p and r . The aim of the ingredient argument is to cast doubt on the assumption that quasi-identity, the protagonist in the second chain link, is a suitable ingredient in an analysis of grounding.

A central success criterion of any reductive analysis is whether the proposed analysing item or structure can account for the known characteristics of the analysandum. For example, the analysis of water as H_2O is convincing because chemists can account for the known behaviour of water – boiling at $100^\circ C$, freezing at $0^\circ C$, etc. – by the structure H_2O and the laws of nature. In a similar way, the identity-based analysis would need to properly account for the central characteristics of grounding. For the moderately conservative post-modalist assumed in Sect. 2, those characteristics are non-causal determination and explanation, which entail metaphysical necessitation. The identity-theoretic proposal is that the positive core of the grounding relation between p and r results from chaining a step of disjoining with a step of identification. It seems plausible that if the resulting positive relation is to help constitute a determinative and explanatory relation between p and r – grounding – then the two steps that are chained to obtain that relation need to at least come close to having a suitable determinative and explanatory character themselves. By analogy, one would not expect a modal relation to readily result from chaining relations that show no sign of modal strength. For the most part, I will address this issue in an indirect manner, by inquiring whether the ingredient in the second step – quasi-identity – has the kind of necessitating force the post-modalist assumes to come with the determinative-explanatory character of grounding.

Suppose it turns out that, though advertised as a core ingredient of an analysis of grounding, quasi-identity shows no sign of a determinative-explanatory character it could contribute to grounding. Identity-theorists might still insist that it is the

complete clever arrangement of truth-functions and quasi-identity, fulfilling both the positive and the negative condition for grounding mentioned above, that endows the relation analysed with the required characteristic. The arrangement argument in Sect. 8 casts into doubt the prospects of this strategy. The main point will be that to understand in which cases the arrangement applies and in which cases it does not, one already needs to master a grounding-like notion.

As a guide for the reader, it may be helpful to also flag the constructive consequences I eventually want to suggest in Sect. 9. According to the ingredient argument, quasi-identity is ill-suited as an ingredient in an analysis of grounding. According to the arrangement model, a notion of a grounding-like relation is already required to understand in which cases the proposed arrangement of truth-functions and quasi-identity applies. For the simple exemplary case of p grounding r , which is quasi-identical to $(p \vee q)$, I will suggest that it is the first step of disjoining p with another content q alone that generates a grounding relationship. Quasi-identity is not part of the generation mechanism of grounding. It is nevertheless important as a mechanism for transporting grounding relations from transparent to opaque cases. Thus, by being disjoined with q , a content p grounds $(p \vee q)$. The specific grounding-generating operation of disjoining is thus at work. Quasi-identity is not involved in the generation of the grounding relation. Yet it is needed to transport the grounding relation so generated from this transparent case to the opaque case that p grounds r , given that $(p \vee q)$ is quasi-identical to r . I will suggest that there are many more specific grounding-generating operations alongside disjoining. In particular, the contents p, q ground $(p \wedge q)$ by conjoining.

5 The ingredient argument, preliminaries: the quasi-extensionality of quasi-identification

The ingredient argument of Sects. 5 to 7 questions the assumption that quasi-identity is a suitable component in an analysis of grounding. More specifically, its point is to argue that quasi-identity cannot contribute to the determinative and explanatory character of grounding. For the most part, it does so in an indirect way: the determinative-explanatory character of grounding involves a necessitating force, and quasi-identity cannot contribute to that force, because it lacks an inherent, built-in non-trivial necessitating force itself. As a preliminary, this section highlights what I will call the quasi-extensionality of quasi-identification. Section 6 then considers a *de dicto* necessitation principle for quasi-identification assumed by Correia and Skiles and argues that it is questionable and, in any case, does not represent an *inherent* necessitating force of quasi-identity. Section 7 first criticises a conceivable essence-based way out and highlights what I call the *pure reflexivity* of quasi-identity. On this basis, it argues that while a *de re* kind of necessitation may be claimed for quasi-identity, it is not of the *non-trivial* sort required for an ingredient in an analysis of grounding.

Let me make clear from the beginning that here, I am concerned only with what may be called relational identity. This is the relationship that, with respect to objects, is expressed by the relational predicate “=”. “Identity” is sometimes also

used synonymously with “essence” or “nature”, in the sense of the identity *of* a thing (Fine, 2015, Hale, 2013: 150; cf. Hale, 2018). I am not opposing the view that essences, natures, or identities *of* things enfold a necessitating force.¹² Also, relational and essentialist identity may be interconnected. For example, essence may provide a basis for crossworld identity relations (Koslicki, 2020), and essence has been linked to identity conditions (Fine, 2016). Identity as a relation and identity *of* a thing are different notions nevertheless.

As a first step in the ingredient argument, it is important to clarify what kind of relation quasi-identity is assumed to be. Correia and Skiles are serious about the close analogy of quasi-identity to ordinary identity. Regarding factual identity, an identification “ $p \equiv q$ ” does not state that the meanings of “ p ” and “ q ” are in some close non-modal, hyperintensional sense equivalent to each other.¹³ The authors take pains to characterise their framework as “worldly” rather than “representational” (2019: 656). Their view clearly is that in a true factual identification such as “This is made of water $\equiv$ this is made of H_2O ”, we have one and the same worldly content, or fact, or “worldly ‘chunk of reality’” (2019: 662) expressed on the left and on the right.

This view follows the paradigm of a true ordinary identification such as “Hesperus = Phosphorus”, where it is one and the same object that is referred to on both sides (cf. Correia, 2020: 230). In a true factual identification, the difference in expression on the two sides no more makes a difference to the content expressed than the difference of singular terms in “Hesperus = Phosphorus” makes a difference to the object referred to, Venus. Similarly, in a true generic identification such as, we may assume, “ x is made of water $\equiv_x x$ is made of H_2O ”, one and the same worldly predicable is expressed by the two open formulas, even though that predicable is perhaps expressed in two different representational ways or guises. Indeed, the authors have sympathy for principles linking quasi-identity to ordinary identity between facts and properties: $p \equiv q$ iff the fact that p = the fact that q , provided both facts exist; and $F \equiv G$ iff the property of being F = the property of being G , provided both properties exist (2019: 643 n. 3).

In addition to offering informal elucidations such as those to the effect that quasi-identifications concern worldly chunks of reality, Correia’s and Skiles’s method in characterising quasi-identity is mainly deductive.¹⁴ They state principles and axioms that govern quasi-identity, such as the principles of reflexivity, symmetry, and transitivity and the axiom of Idempotence ($A \equiv A \wedge A$) mentioned above, and prove theorems. However, to get clearer about a given phenomenon, it is often helpful to study the semantic behaviour of an expression for the phenomenon. The standard approach is to look for semantic clauses stating truth-conditions for sentences containing such an expression. This does not mean that proposed truth-conditions constitute an analysis of the phenomenon in question. For example, in a standard

¹² At the end of Sect. 9, I will suggest that facts of essence emerge from grounding facts, so that the necessitating force ultimately stems from grounding after all.

¹³ Correia (2016) speaks of “metaphysical equivalence”, yet from then on adopts the locution of generalised identity.

¹⁴ I address Correia’s (2017) semantic clause for identifications in Sect. 8.

semantics for first-order logic, we say that “ Fa ” is true just in case the referent of the constant “ a ” is in the extension of the predicate letter “ F ”. This helps to understand that the point of a predication is to classify a particular object as being of a certain kind. Yet it does not mean that the predication is really about singular constants, predicate letters, and the membership of referents in extensions.

I want to suggest something similar for identity and, by analogy, quasi-identity. The standard semantic clause for objectual identity reads:

“ $\alpha = \beta$ ” is true just in case the referent of α is identical to the referent of β .

The truth-conditions of object-language identity statements are stated in terms of a meta-language expression for identity. However, assuming that both terms have unique referents, this usual clause is logically equivalent to the following one:

“ $\alpha = \beta$ ” is true just in case there is an object x such that both α refers to x and β refers to x .

This semantic clause does not constitute an analysis of the identity relation in terms of converging reference of singular terms. It is helpful for understanding identity nevertheless: where identity holds, one is concerned with only one object rather than two. The crucial observation is that the identity sign is a purely extensional expression. It is sensitive only to *what* the two flanking singular terms refer to, whether this is one object or two. It is completely insensitive to *how* objects are referred to – by expressing what intensions or individual concepts, by referring via what Fregean senses, or in what representational guises. The identity sign thereby sharply contrasts with modal expressions, such as the schema “ $\Box(\phi \rightarrow \psi)$ ” for metaphysical entailment. This schema is, of course, sensitive not only to the extensions of the two sentences ϕ and ψ , i.e., their truth-values, but to their intensions. For its truth requires that ψ is true at every possible world at which ϕ is true. Surely identity and modality interact in interesting ways. Yet the extensionality of “ $=$ ” is rather contrary to the idea that identity enfolds a characteristic modal force all by itself.

Adopting the usual view that the extension of a sentence is its truth-value, the symbol for quasi-identity “ $\equiv$ ” is not extensional. A two-place extensional operator for sentences that is sensitive only to whether the sentences have the same truth-value would be “ $\leftrightarrow$ ”, the truth-functional biconditional. The symbol “ $\equiv$ ” for factual identity, by contrast, is sensitive to the sentential contents expressed by the flanking sentences.¹⁵ Still, a semantic clause can be phrased in analogy to the clause for ordinary identifications:

“ $\phi \equiv \psi$ ” is true iff there is a worldly sentential content p that is expressed both by ϕ and by ψ .

For generic identifications, the clause reads:

¹⁵ A less Fregean and more Russellian view seems possible that treats sentential contents instead of truth-values as the extensions of sentences. Then “ $\equiv$ ” is extensional just like “ $=$ ”. However, one would then need a notion of “super-extensionality” for the truth-functional “ $\leftrightarrow$ ”.

“ $\Phi(x) \equiv_x \Psi(x)$ ” is true iff there is a worldly predicable X^1 that is expressed both by “ $\Phi(x)$ ” and by “ $\Psi(x)$ ”.¹⁶

As with objectual identity, those clauses are not meant to constitute metalinguistic analyses of quasi-identity. Still, the clauses reveal that, while quasi-identification is not extensional, an analogous notion applies to it. The ordinary identity sign is sensitive only to *what* things are referred to by the flanking terms, whether this is one thing or two. By analogy, factual identification is sensitive only to *what* sentential contents are expressed by the flanking sentences, whether this is one content or two. Generic identification is sensitive only to *what* predicables are expressed by the flanking formulas, whether this is one predicable or two. Both kinds of quasi-identification are insensitive to *how*, that is, by what concepts or in what representational guises those contents or predicables are expressed; “*representational* differences between p and q ”, such as “differences in [...] the ‘guise’ their contents are represented under [...] no more undermine a generalized identity than those between ‘Hesperus’ and ‘Phosphorus’ undermine the truth of ‘Hesperus=Phosphorus’” (Correia & Skiles, 2019: 645). Due to its exclusive sensitivity to what is expressed and its insensitivity to how it is expressed, we may introduce a second “quasi” notion and call quasi-identification *quasi-extensional*. This classification of quasi-identification sits particularly well with Correia’s and Skiles’s self-positioning as being concerned with identifications between “worldly chunks” and with a worldly, as opposed to a conceptual or representational, construal of grounding.

6 The ingredient argument part I: *de dicto* necessitation and quasi-rigidity

With these preparations we can turn to the question of a necessitating force of quasi-identity. Let me first explain what sort of necessitating force one ought to expect of an ingredient in an analysis of grounding. First, the necessitation by grounding is non-trivial. Typically at least, instances of grounding are irreflexive: the groundee is some other item than the ground(s). We ought to expect that as an ingredient in an analysis of grounding, quasi-identity is non-trivially necessitating at least in this minimal sense. Secondly, for the moderate conservative, grounding is necessitating *by* being determinative and explanatory. The necessitation of the groundee by the grounds is inherent to or built into the determinate-explanatory character of grounding. Therefore, when an account of the determinate-explanatory character of grounding is offered, we expect an account of a necessitating force to flow from that very account. We do not expect to be offered a substantially different story of why the groundee is *also* necessitated by the grounds, in addition to the account why it is determined and explained by them. Correspondingly, as an ingredient in an analysis of grounding, quasi-identity ought to be inherently necessitating. We would expect its necessitating force to emerge from an account of what quasi-identity is itself,

¹⁶ For convenience, I will assume that both predicates and open formulas express predicables. More precisely, we may say that a formula “ $\Phi(x)$ ” expresses the predicable expressed by the predicate “ $\lambda x\Phi(x)$ ”.

rather than being offered a substantially different story of why there is *also* a necessity pertaining to identifications. I will argue that a conceivable *de dicto* necessitation principle for quasi-identifications violates the second requirement of inherence (part I of the argument, this section) and that a *de re* necessitation by quasi-identity that might instead be claimed violates the first requirement of non-triviality (part II, next section).

Correia and Skiles (2019: 646) assume a necessitating force of quasi-identity by holding that “[a]s with objectual identity, generalized identity is tightly linked to metaphysical necessity.” They use the assumed fact as a model that an objectual identification “ $a=b$ ” entails the necessary co-extensionality of the two singular terms, “ $\Box a=b$ ”. By analogy, they hold that a factual identification “ $p \equiv q$ ” entails the necessary co-extensionality of the two sentences, “ $\Box(p \leftrightarrow q)$ ” (2019: 646, statement (9)); similarly, a generic identification “ $\Phi(x) \equiv_x \Psi(x)$ ” is assumed to entail the necessary co-extensionality of the two predicates (or open formulas), “ $\Box \forall x(\Phi(x) \leftrightarrow \Psi(x))$ ”.¹⁷ This may be called a *de dicto* necessitation principle, because the particular sentences and predicates occur within the scope of the necessity operator.

We best start with the assumed model of objectual identity. We can all agree that it is due to the reflexivity of identity that, necessarily, $\alpha = \alpha$. The question is on what grounds a more substantive necessitation principle could be maintained. Here is how Kripke (1980) explains the principle that if $\alpha = \beta$, then necessarily $\alpha = \beta$:

[...] everyone agrees that descriptions can be used to make contingent identity statements. If it is true that the man who invented bifocals was the first Postmaster General of the United States – that these were one and the same – it’s contingently true. (1980: 98) [...] such terms as “Hesperus” and “Phosphorus”, when used as names, are rigid designators. They refer in every possible world to the planet Venus. (1980: 102) [...] if Hesperus and Phosphorus are one and the same, then in no other possible world can they be different. We use “Hesperus” as the name of a certain body and “Phosphorus” as the name of a certain body. We use them as names of those bodies in all possible worlds. If, in fact, they are the same body, then in any other possible world we have to use them as a name of that object. And so in any other possible world it will be true that Hesperus is Phosphorus. (1980: 104)

Three things stand out. First, Kripke admits contingent identifications with descriptions. Consequently, he agrees that the principle that if $\alpha = \beta$, then necessarily $\alpha = \beta$ only holds for a certain subclass of terms α and β . Secondly, in his argument for a suitably restricted version of the principle, he fully relies on semantic considerations. Thirdly, the crucial premise in that consideration – the one that allows for upgrading the simple truth of an identification to its necessary truth – is the semantic one that both flanking terms are rigid, i.e., that each term refers to the same object in

¹⁷ In (2019: 646, statement (8)), they maintain the stronger principle “ $\Box \forall x \Box (\Phi(x) \leftrightarrow \Psi(x))$ ”; see (2022: 1286) for the weaker version with only one box.

every possible world. Consequently, the principle only holds for identifications with rigid terms, as Correia and Skiles (2022: 1291 n. 11) recognise.¹⁸

Contrast this with a conceivable account of the necessitating force of facts of essence. An essentialist could reason as follows: an essential feature of a thing is part of the thing's real definition (cf. Fine, 1994); real definition is analogous to the definition of concepts; if G is a part of the definition of concept F , then it makes no sense to assume an instance of F that is not G , and therefore F s are necessarily G ; by analogy, if a property P is part of the real definition of an object a , then it makes no sense to assume a without assuming a to have P , and therefore a has P necessarily.

I do not wish to defend this essentialist account. The point is that in contradistinction to Kripke's explanation, this account of a necessitating force mentions no semantic facts whatsoever. Instead, it reflects on the nature of the phenomenon – essentiality – that is expected to exercise such a force. Because of this, the resulting principle is not restricted to a specific kind of expression. Kripke, by contrast, does not at all reflect on the nature of identity. The fact that for rigid terms, if $\alpha = \beta$, then necessarily $\alpha = \beta$, does not result from a specifically necessitating nature of identity. After all, the nature of identity is perfectly transparent. It is nicely revealed by the extensional semantic clause that an identification is true just in case the terms involved refer to just one object.

Instead, the necessitation principle is a mere effect of the assumed semantic property of the flanking terms, i.e., their rigidity. A modal property of a certain kind of identity statement – that they are necessarily true if true – is explained by an assumed modal property of the singular terms involved – that they refer to the same object in every possible world. Maybe it can be argued that only sentences with two rigid terms are “genuine” identifications, identifications with nonrigid definite descriptions perhaps demanding a Russellian analysis. This would not change the fact that the source of the necessary truth of identifications is this semantic fact of rigidity of the flanking terms and not a specific necessitating nature of identity.

I want to argue that something very similar is true of quasi-identifications. The principle that factual and generic identifications entail the necessary co-extensionality of the flanking sentences or formulas only holds for a specific kind of sentence and formula. The explanation of why the necessitation principles hold for this kind of expression is based exclusively on semantic properties of expressions of this kind. A modal property of quasi-identifications is explained by an assumed modal property of the sentences or formulas involved. No specific necessitating nature of quasi-identity is revealed.

The semantic property I have in mind I call *quasi-rigidity*:

¹⁸ Thus, as Burgess (2014: 1576–1577) stresses, Kripke arrives at a necessitation principle for particular identity statements “ $a=b$ ” not by deductive means, but by “an argument in the metalanguage” that relies on the semantic assumption that “the denotation of a and likewise of b should be invariant or *unchanging* across the range of whatever kind of ‘possibilities’ are in question,” a phenomenon that then receives the label of a rigid designator. I ignore issues of existence here (see Burgess 2014: 1573–1574), as they seem to be irrelevant to the analogy I have in mind.

A sentence is *quasi-rigid* just in case it expresses the same worldly content in all possible worlds, and *quasi-nonrigid* otherwise.¹⁹

A predicate or open formula is *quasi-rigid* just in case it expresses the same worldly predicable in all possible worlds, and *quasi-nonrigid* otherwise.

The general principle that “ $\phi \equiv \psi$ ” entails the necessary co-extensionality “ $\Box(\phi \leftrightarrow \psi)$ ” only holds if both flanking sentences are quasi-rigid; similarly for the entailment between “ $\Phi(x) \equiv_x \Psi(x)$ ” and the necessary co-extensionality “ $\Box\forall x(\Phi(x) \leftrightarrow \Psi(x))$ ”.²⁰ For suppose at least one of two sentences “ p ” and “ q ” is quasi-nonrigid. Then the two sentences may happen to express the same content in the actual world, so that “ $p \equiv q$ ” is actually true; yet there may be a possible world in which the two sentences express different contents, one of which may be true and the other false in that world, so that “ $p \leftrightarrow q$ ” is false in that world and “ $\Box(p \leftrightarrow q)$ ” is actually false. Similarly for generic identifications with at least one quasi-nonrigid formula.

Are there, or could there be, quasi-nonrigid sentences and predicates that destroy the entailment of necessary co-extensionality? The view of sentences and formulas expressing “worldly chunks” in particular seems to open up space for that possibility. It is at least a conceivable view that the worldly predicable expressed by “is fragile” specifies the categorical basis of fragile things in the actual world. The categorical predicable would be expressed in a dispositional guise, as the material structure underlying the dispositional profile of fragility (roughly, to break when struck). It is likewise conceivable that the worldly predicable expressed by “is massy” is the actual physical quality of mass. It would be expressed in a theoretical guise, as the quantity playing the mass-role specified by Newton’s dynamic law and the law of gravitation.

In both cases it can be assumed that the worldly predicable underlies the dispositional profile or plays the theoretical role only contingently. In other possible worlds, other predicables do so in their place. Further, it is conceivable that we can express one and the same worldly predicable in two different contingent guises. *Cum grano salis*, the dispositional profiles associated with the two predicates “is electroconductive” and “is heatconductive” have the same actual categorical basis, namely, overlapping valence and conduction bands. Likewise, we may assume that the two predicates “has inertial mass” and “has gravitational mass” express one and the same physical predicable of mass. Yet they do so in two different contingent guises, as the quantity that relates force to acceleration and as the quantity that helps determine gravitational force.

¹⁹ Cf. Skiba’s (2025: 489) conception of temporally non-rigid sentences that “stand for different contents at different times.”

²⁰ This notion of quasi-rigidity is closer to the second than to the first proposal to extend Kripkean rigidity to predicates as distinguished by Nimtz (2019: 335). I do not, however, construe a quasi-rigid predicate as primarily designating a universal and only derivatively applying to objects. Also, all that is required for the following is the conceivability of quasi-nonrigid predicates, so we need not worry about problems of the kind mentioned by Nimtz (2019: 336). As he makes clear in his “theoretical choice”, such problems do not call into question the consistency of the proposed notion of generalised (non-) rigidity, and similarly for quasi-(non-)rigidity.

On these assumptions, the generic identification “ x is electroconductive $\equiv_x x$ is heatconductive” would be true, while the statement of necessary co-extensionality “ $\Box \forall x(x \text{ is electroconductive} \leftrightarrow x \text{ is heatconductive})$ ” would be false. In some other possible world, two different worldly predicables *having E-structure* and *having H-structure* underly the two dispositional profiles. The two predicables characterise different things, so that the co-extensionality does not hold in that world. Likewise, the factual identification “This material is electroconductive $\equiv$ This material is heatconductive” would be true, because in the actual world, both sides would express the same worldly fact. But the two sentences would not necessarily have the same truth-value. For with respect to some other possible world they express different worldly contents with different truth-values. Similarly, in some possible world, two different physical predicables play the roles of inertial and of gravitational mass, and they may happen to characterise different things. The corresponding identification would be actually true, without it being the case that necessarily, all and only objects that are inertially massy are gravitationally massy.²¹

Against the suggestion of a contingent link between dispositions and their categorical bases as well as between theoretical role and role-player, dispositional essentialists contend that physical properties play their theoretical roles essentially and hence necessarily. This still allows for different properties to play the same role in different possible worlds. To exclude this, A. Bird’s (2007) strong version of essentialism would be required. It says that the dispositional role exhausts a physical property’s essence. Bird defends strong essentialism in detail. However, not even Bird claims that its denial is inconceivable. Also, strong essentialism is a view about *fundamental* physical properties. It is consistent with the assumption that an ordinary disposition such as breakability has different categorical bases in different possible worlds.

For another kind of example, suppose that predicationally worldly facts resemble singular propositions by concerning objects *in propria persona*. Assume further that “the morning star” and “the evening star” refer to Venus via different contingent descriptive senses. Then “The morning star is a planet $\equiv$ the evening star is a planet” would be a true factual identification, while there are possible worlds in which one of the flanking sentences is true and the other is false. Also, the two formulas “ x sees the morning star” and “ x sees the evening star” could express the same singular worldly predicable *seeing Venus* without being necessarily co-extensive.

The semantic views just considered do not seem to be absurd. In particular, they appear to represent conceivable ways to spell out the idea of sentences and formulas expressing definitely worldly contents and predicables. More generally, if the distinction between representation and what is going on in the world is made at all, the

²¹ Similarly for Dorr’s (2016) example: The identification “Vixens just are female foxes” entails “Necessarily, all and only vixens are female foxes” only if the three predicates involved express their predicables quasi-rigidly. It could, for example, be that “vixen” and “fox” quasi-rigidly express biological kind-like predicables, while “female” expresses a biological predicable of sex but via a contingent mode of presentation, such as *the biological sex that is underprivileged among humans*. It will then not be necessarily true that every and only female foxes are vixens, because in some other possible world a different sex is underprivileged among humans.

link between representational guises and worldly contents may well be contingent rather than necessary.

Technically, nonrigid sentential expressions are naturally formed if a higher-order, sentential version of definite descriptions is admitted. Informally, one might say: “It’s raining and it’s freezing – that’s what Auntie most fears.” Using “ THE ” as a description operator that binds sentential variables, this can semi-technically be written as a quasi-identification:

$\text{THE } p$: Auntie fears most that $p \equiv \text{it is raining} \wedge \text{it is freezing}$).

Assume the description “ $\text{THE } p$: Auntie fears most that p ” is accepted as a genuine sentential expression, rather than being slaughtered in a Russellian fashion. Then it picks out different sentential contents in different worlds, depending on what Auntie fears most there. Therefore, the following biconditional is not a necessary truth:

$\text{THE } p$: Auntie fears most that $p \leftrightarrow (\text{it is raining} \wedge \text{it is freezing})$.

For it may be true in a world w that it is raining and freezing, while what Auntie fears most in w is that the sky falls on her head, which is false in w .

The point is not that the semantic views suggested above are correct or that genuine sentential definite descriptions must be embraced. It is neither that a theorist of worldly contents and predicables is committed to any of this. Maybe it can be argued that there are no quasi-nonrigid sentences and formulas, or even that there cannot be such expressions in principle, or that only quasi-identifications with quasi-rigid expressions are genuine, quasi-nonrigid expressions and sentential descriptions in particular demanding a Russellian sort of analysis. Maybe sentences and formulas do not express contents and predicables in a guise at all, so that the issue of a merely contingent connection between guise and what is expressed does not arise. Or perhaps the framework is restricted to quasi-rigid expressions by stipulation.²² Nothing of this would change the fact that the proposed *de dicto* necessitation principles for quasi-identifications are not accounted for by a built-in necessitating nature of quasi-identity.

After all, the nature of quasi-identity is perfectly transparent. It is nicely revealed by the quasi-extensional semantic clause that a quasi-identification is true just in case the sentences or formulas involved express just one worldly content or predicable. Instead, the necessitation principles are explained in a semantic manner. The crucial premise is that the expressions involved have the semantic property of quasi-rigidity, for whatever reason. A modal property of quasi-identifications – that if they are true, the corresponding co-extensionality statements are necessarily true – is explained by a modal property of the sentences or formulas involved – that they express the same content or predicable in every possible world.

Importantly, quasi-rigidity and -nonrigidity are semantic and not meta-semantic phenomena, just like Kripke’s (1980: 77–78) rigidity and nonrigidity. Of course, “bachelors” might have been used to mean *pigs* and “are male” might have meant

²² Cf. Correia & Skiles (2022: 1291 n. 11), where they consider restricting their claim of necessitation to identifications between (quasi-)rigid expressions.

can fly. Under those conditions, “Bachelors are male” would have expressed a falsehood. Nevertheless, as actually used by us, the statement is a necessary truth. Similarly, “Hesperus” and “Phosphorus” might have named the moon and the sun instead of Venus. Nevertheless, we use the names as rigid designators for Venus (says Kripke). Therefore, as used by us, “Hesperus and Phosphorus” is a necessary truth. Correspondingly, a nonrigid designator is not a term that might have been used to refer to something else. It is a term that, as actually used by us, picks out different things in different possible worlds. By analogy, a quasi-nonrigid sentence is not a sentence that might have been used to state a different content. It is a sentence that as actually used by us, expresses different contents in different possible worlds.

It may be worried that those semantic considerations are alien to Correia’s and Skiles’s mainly deductive account. However, the notion of quasi-rigidity is relevant also to a deductive approach to the necessitation principles. Correia and Skiles (2022: 1287) offer a deduction for the entailment between generalised identifications and statements of necessary co-extensionality. They do not present it as a metaphysical explanation of the entailment, but only as a theoretically neutral justification. Nevertheless, the deduction is valid only given a background assumption of quasi-rigidity. Necessary co-extensionality can be deduced from factual identity as follows:

1. $p \equiv q$ Assumption
2. $\Box(p \leftrightarrow p)$ Propositional logic plus rule of necessitation
3. $\Box(p \leftrightarrow q)$ Leibniz’s Law for sentence positions

Step 3 applies a higher-order version of Leibniz’s Law to a modal context, where the law is construed as a valid inference rule for the substitution of quasi-identicals. That application is legitimate only if the relevant sentences are quasi-rigid, though. For under what condition is it true that, if a sentence (here “ p ” itself) necessarily has the same truth-value as “ p ”, because it in all worlds expresses the same content as “ p ”, it also necessarily has the same truth-value as “ q ”, because it in all worlds expresses the same content as “ q ”? Only if “ p ” and “ q ” do not only in fact express the same worldly content but, being quasi-rigid, do so in every possible world.

This concludes the first part of the ingredient argument. It shows that the *de dicto* necessitation principles advocated by Correia and Skiles are not so obvious; that they hold at best under a semantic assumption of quasi-rigidity; that it is not the nature of quasi-identity but the semantic property of quasi-rigidity that accounts for the claimed entailment of necessary co-extensionality; and that the principles therefore do not represent an inherent, built-in necessitating force of quasi-identity that could help constitute a corresponding force of grounding.

7 The ingredient argument part II: essence and *de re* necessitation

In this section, I first want to respond to conceivable attempts to evade the argument of the previous section. This discussion will help emphasise that like ordinary identity, quasi-identity is what I will call a *purely reflexive* relation. On this basis, I will argue that a *de re* kind of a necessitating force that may be attributed to quasi-identity is not of the right kind for an ingredient in an analysis of grounding, because it blatantly fails to be non-trivial.

One conceivable attempt to evade the argument from Sect. 6 is to resort to essence. Identity-theorists might try to endow quasi-identity with a built-in non-trivial necessitating force in the *de dicto* sense by adopting the following principle: it is part of the essence or nature of quasi-identity that, if $p \equiv q$, then $\Box(p \leftrightarrow q)$, for arbitrary meaningful instances of “ p ” and “ q ”; similarly for generic identity.

A general problem with this is that in their identity-based account of essence, Correia and Skiles (2022: 1291 n. 11) rely on the quasi-rigidity of sentences and formulas no less than in their account of grounding. It would therefore be a questionable move for them to try to solve a problem that arises from the possibility of quasi-nonrigid expressions by relying on essence.

The more specific problem with the proposal is that the nature of quasi-identity is perfectly transparent already. It is nicely revealed by the quasi-extensional semantic clause that “ $\varphi \equiv \psi$ ” is true just in case one and the same worldly content is expressed both by φ and by ψ , in whatever guises the two sentences express that content. This may be restated in the material mode by saying that quasi-identity, like objectual identity, is *purely reflexive*. Objectual identity is purely reflexive in the following sense: it only ever links an object to that same object, irrespective of the intensions, concepts, senses, or guises by or in which the object is referred to. Quasi-identity is purely reflexive in a parallel sense: it only ever obtains between a sentential content and that same content, or between a predicable and that same predicable, irrespective of the concepts or guises by or in which contents or predicables are expressed on the two sides of an identification.²³ To insist that it is an additional part of the essence of the meaning of “ $\equiv$ ” that if $p \equiv q$, then $\Box(p \leftrightarrow q)$, independently of whether the flanking sentences are quasi-rigid or not, would therefore mean to change the subject. We would no longer be concerned with quasi-identity, which

²³ It may be worried that quasi-identity is not so transparent after all. For different systems individuate contents differently and, so the thought, this amounts to different notions of higher-order identity. Indeed, in intensional frameworks, all necessary equivalent sentences express the same content; in Booleanism (Bacon 2020), all Boolean equivalents express the same content; Correia’s and Skiles’s system denies both identifications; and there are even more fine-grained views. However, those are differences concerning what is assumed as a content and concerning the relation of expressing between sentences and contents. They do not amount to differences concerning the nature of higher-order identity. Once it is settled what kind of contents are expressed by sentences, the same idea of identity applies to all systems: an identification holds just in case one and the same content is expressed on both sides. By analogy, one would not want to say that a botanist and a zoologist use different notions of ordinary identity, only because one is talking about plants and the other about animals. The point is not invalidated but confirmed by the fact that identity crucially features in identity criteria (see Sect. 9), such as that all and only sets with the same members are identical. Those principles could not do their job unless it was clear in advance what is meant by identity.

only concerns what contents are expressed, but with a relationship of equivalence²⁴ that is sensitive to the concepts or guises by or in which contents are expressed. Correia and Skiles make it very clear that they base their analyses on a notion of generalised identity and not of equivalence, and this proposed analysis is what this paper is concerned with.

(A different appeal to essence would be to say that it is due to the essence of the groundee that the grounds necessitate the groundee. For example, it would be essential to *(It is raining $\vee$ is is freezing)* to be necessitated by *It is raining*. However, the necessitation would then not be built into the grounding relation itself, as the moderate conservative background view requires, but be an essence-based extra. To restore the unity, the idea could be to reduce grounding to essence: *p*'s grounding (*p* $\vee$ *q*) would consist in its being essential to (*p* $\vee$ *q*) to be necessitated by *p*. This would be a project very different from Correia's and Skiles's, though.)

At this point, identity-theorists might turn away from their *de dicto* necessitation principle and instead turn to the claim that quasi-identity has a built-in necessitating force of a *de re* kind. The view could be that this *de re* force can be stated by a quantified principle, which holds independently of semantic assumptions. The principles for ordinary and for factual identity would read:

$$\forall x \forall y: x = y \rightarrow \Box(x = y)^{25}$$

$$\forall p \forall q: p \equiv q \rightarrow \Box(p \leftrightarrow q)$$

They contain no non-logical constants the rigidity or quasi-rigidity of which could be discussed. Therefore, so the suggestion, the necessitation can only be traced back to identity and quasi-identity.

First, however, it is not entirely true that the principles do not rest on semantic assumptions. The standard view of variable assignments is that they assign to singular variables nothing more than an object in the domain of quantification and that they do so independently of possible worlds. By using variables instead of constants, we therefore get rid of intensions the necessity operator could be sensitive to and that may determine different objects for different worlds. Yet there have been dissenters. In his Carnapian framework, D. Lewis (1970: 195) makes variable assignments world-relative, thereby ascribing intensions to variables that may well be non-constant. In such a framework, the first of the above principles fails. By analogy, one may make the assignment of worldly sentential contents to sentential variables world-relative, so that a guise associated with a variable determines different contents for different worlds. Then the second principle fails. Non-standard as such views may be, their conceivability shows that the above principles depend on semantic assumptions after all: that singular variables simply run over objects and that sentential variables simply run over sentential contents.

²⁴ Quasi-identity is still a higher-order equivalence relation in the formal sense of being reflexive, symmetric, and transitive.

²⁵ See Burgess (2014) for the difference in status between this quantified principle and the transition from a particular identity statement "*a* = *b*" to " $\Box a = b$ " in Kripke's work.

Secondly, and more importantly, assume a framework in which the two principles hold. Based on the first of them, Kripke (1980: 3) states that identity is an “internal” relation and that “the *objects* designated by ‘*a*’ and ‘*b*’ will be necessarily identical” even “[i]f ‘*a*’ and ‘*b*’ are not rigid designators”. I do not object. What Kripke has in mind could be stated by a schematic *de re* construction:

$$\forall x \forall y: \alpha = x \wedge \beta = y \wedge \alpha = \beta \rightarrow \Box(x = y)$$

It holds whether the terms α and β are rigid or not. A parallel *de re* schema can be stated for factual identity:

$$\forall p \forall q: \varphi \equiv p \wedge \psi \equiv q \wedge \varphi \equiv \psi \rightarrow \Box(p \leftrightarrow q)$$

It holds whether the sentences φ and ψ are quasi-rigid or not.

Maybe someone wants to read a necessitating force into identity and quasi-identity on this basis. However, the question is what kind of necessitation we are then dealing with. Since the assumption is that singular variables just run over objects, the necessitation in the first schema can only concern those objects. Now, everybody can agree that identity implies a necessitation pertaining to objects. We can state, for example, that whenever $x=y$, then necessarily, if x exists, so does y . Yet this is so only because we are then concerned with one and the same object. Similarly, if the assumption is that sentential variables just run over sentential contents, the necessitation can only concern those contents. And everybody can agree that whenever $p \equiv q$, then necessarily, if it is true that p , then it is true that q . Yet this is so only because we are then concerned with one and the same content. Similarly for generic identity: if it is assumed that predicate variables just run over predicables, then everybody can agree that whenever $X^1=Y^1$, then necessarily, if something is X^1 , it is Y^1 . Yet this is so only because we are then concerned with one and the same predicable.

The problem is that in the *de re* sense, quasi-identity is necessitating only in a completely trivial way: the truth of a content p necessitates that of p , and the presence of a predicable X^1 at an object necessitates the presence of X^1 at the object, just as the existence of an object x necessitates that of x . Such trivial necessitation is a poor basis for helping to give grounding its non-trivial, determinative and explanatory necessitating character.

The problem may be re-stated without the detour via necessitation. Quasi-identification is purely reflexive. It only ever holds between an item and that same item, irrespective of the guises in which the items are expressed. However, we do not expect a determinative and explanatory relation to be purely reflexive. Maybe very specific cases of reflexive determination and explanation can be considered. The normal case, however, is that the determinant is distinct from what is determined and that the explanans is distinct from the explanandum. Being purely reflexive, quasi-identity therefore is a poor candidate for an ingredient in an analysis of a relation such as grounding that has a determinative and explanatory character.

This problem of pure reflexivity concerns determination and explanation alike. Identity theorists (“unionists”) think that grounding just is a form of metaphysical explanation. But a relation that only ever holds between an item and itself cannot be a relation of metaphysical explanation, which normally holds between distinct relata. Tracking theorists (“separatists”) think that grounding is basically determinative or productive in a non-causal, metaphysical way. For them, metaphysical explanations only track relations of metaphysical determination. But a relation that only ever holds between an item and itself cannot be a relation of metaphysical determination, which normally holds between distinct relata. Neither the determinative nor the explanatory character of grounding can stem in part from a corresponding character of quasi-identity, which, being purely reflexive, has no such character.

8 The arrangement argument: could grounding emerge from an arrangement of quasi-identity and truth-functions?

The ingredient argument of Sects. 5 to 7 has been to the effect that quasi-identity is ill-suited as an ingredient in an analysis of grounding, because it cannot contribute one bit to the relation’s determinative-explanatory character. Identity-theorists may still insist that, even though one core ingredient lacks any sign of such a character, the explanatory determinativeness of grounding can emerge from the subtle way the analysis arranges quasi-identity and truth-functions. In this section, I will argue that there are reasons for being highly sceptical about this idea.

Let us begin with the simple structure considered in Sect. 4: p is to ground r ; the positive condition for this to be the case is that p is a disjunctive part of r , which is analysed as r being quasi-identical to $(p \vee q)$ for some q ; the additional negative condition requires that r is not in turn a logical part of p . Focusing on the positive condition, I suggested that the analysis of disjunctive parthood amounts to chaining two steps: first, p is a disjunct in $(p \vee q)$ for suitable q ; secondly, $(p \vee q) \equiv r$.

However, we are not concerned here with the usual way to define a relation by chaining two given relations. For example, by chaining causation and parthood, we can define the complex relation of one event being the cause of a part of another. In this model case, three events are involved, and the chaining of the two relations can be depicted as follows: e_1 causes e_2 , which is a part of e_3 . By contrast, only two contents are involved in the proposed analysis of disjunctive parthood, call them *disjunct* and *disjunction*. The chaining of relations would have to be depicted as follows: *disjunct* is a disjunct of *disjunction*, which is quasi-identical to itself. Thus, if we only look at what contents stand in what relations, the second, identificatory step of the analysis runs empty. The relation of one content being a disjunct of another is doing all the work. Viewed that way, disjunctive parthood is not analysed at all.

What this shows is that other than in the model case of chaining causation and parthood, the way contents are or can be represented plays a crucial role in the proposed analysis of disjunctive parthood. The core idea of the analysis may be rephrased as follows: p is a disjunctive part of r , in the sense that content r can alternatively be expressed by a disjunctive sentence “ $(p \vee q)$ ” in which “ p ” expresses content p . We must then ask, however, what it is about content r that makes it

representable by a disjunction “ $(p \vee q)$ ”. The suspicion is that the answer must be that r is so representable because content p is in fact a disjunct of it. It seems that to understand the proposed analysis, we already need a notion of one content being a disjunct of another. We already need to understand a relation of disjunctive parthood between contents.

Let me try to confirm and sharpen this diagnosis, now considering the complete identity-theoretic arrangement with its positive and negative conditions on grounding. One important respect in which the complete arrangement might be expected to help is the asymmetry of determination and explanation. The identity-based analysis seeks to accommodate the asymmetry of grounding by excluding cyclic patterns explicitly: when some facts $p_1, p_2, \dots$ form a disjunctive part of a fact q , they ground this fact only if q is not in turn a logical part of any of the $p_1, p_2, \dots$. The idea could be that this exclusion of cycles crucially contributes to the emergence of an asymmetric determinative and explanatory character.

Let me explain my scepticism about this idea using the asymmetry between *grue* and *green*. I will argue that an account of this asymmetry already requires a grounding-like notion. More generally, my diagnosis is that the proposed identity-theoretic framework is severely incomplete. It does not tell us enough about truth-conditions for quasi-identifications and, relatedly, about identity-conditions for contents and predicables of the intended worldly sort. And there are reasons for thinking that a substantive account of such conditions already requires a notion of grounding.

It is plausible that the notorious Goodmanian predicable *grue* is generically identical to, say, being green before or in 2030 AD $\vee$ blue after 2030 AD (cf. Correia & Skiles, 2019: 646; Dorr, 2016: 70–79). Being green before or in 2030 AD is thereby a disjunctive part of *grue*. For a grounding relation to obtain, the identity-based account additionally requires that *grue* is not in turn a logical part of *green*. In particular, it must not also be the case that *green* is generically identical to being *grue* before or in 2030 AD $\vee$ *bleen* after 2030 AD, where *bleen* is generically identical to being blue before or in 2030 AD $\vee$ green after 2030 AD.

Let us suppress the variable-binding in generic identifications. The question then is why

(GRUE) *grue* $\equiv$ being green before or in 2030 AD $\vee$ blue after 2030 AD

should be true whereas

(GREEN) *green* $\equiv$ being *grue* before or in 2030 AD $\vee$ *bleen* after 2030 AD

is false. The intuitive explanation of the asymmetry certainly is that we learned the predicate “*grue*” first from Goodman’s (somewhat different)²⁶ disjunctive characterisation in terms of “*green*” and “*blue*” and that its meaning therefore is disjunctive. In sharp contrast, we did not learn “*green*” in this way. There is no indication that the meaning of an ordinary colour predicate is somehow disjunctive regarding what is the case before or at a certain point in time and what is the case after that time.

²⁶ Differences between alternative characterisations of “*grue*” (see Jackson 1975) do not affect the point to be made here.

However, the question is what it could mean more precisely that the *meaning* of “grue” is disjunctive in this time-related way and that the *meaning* of “green” is not. One may want to say that it is by stipulative definition that “grue” means being green before or in 2030 AD $\vee$ blue after that time and that nothing similar is true of “green”. Yet the question would remain in what sense “grue” thereby comes to mean something disjunctive. And the question remains why and in what sense it is not also the case that “green” in fact means being grue before or in 2030 AD $\vee$ bleen after that time, although the predicate did not receive its meaning by a stipulative “disjunctive” definition.

Those questions are pressing because on an intensional understanding of predicate meanings, there is no asymmetry. Intensionalists accept (GRUE) and (GREEN) alike. The set of possible grue things is identical to the set of the possible things that are either green before or in 2030 AD or blue after that time. Likewise, the set of possible green things is identical to the set of the possible things that are either grue before or in 2030 AD or bleen after that time. For intensionalists, things are completely symmetric.

Hyperintensionalists are faced with the question of what breaks this symmetry, and what breaks it in such a way that (GRUE) is true while (GREEN) is false. Here is a proposal. We learned “grue” first from Goodman’s disjunctive characterisation. Plausibly, this way of learning the predicate results in a specific kind of practice with it. When we want to apply “grue” to a thing (now, before 2030), we first determine that it is green and then derive from this that it is grue. By contrast, when we want to apply “green” to a thing (now), we just look at it under suitable conditions. We do not first determine that it is grue and derive from this that it is green.

A natural idea is that in a hyperintensional framework, the meaning of “grue” needs to match our derivational practice with the predicate; whereas there is no such practice to be matched in the case of “green”. Just as we derive “the thing is grue” from “the thing is green (and it’s not yet 2030)”, the meaning of “grue”, *grue*, must *really* derive from being green before or in 2030 AD.²⁷ Arguably, this notion of one item *really deriving* from another is one of grounding, or at least grounding-like. *Grue* is generically grounded by being green before or in 2030 AD. This groundedness is part of what makes the predicable disjunctive in a time-related way, as opposed to *green*.

The problem for the identity-based analysis is that this grounding statement concerning *grue* must be made in advance, before the identity-based analysis can be applied. A notion of grounding is needed already to make sense of the crucial contrast between the truth of (GRUE) and the falsity of (GREEN). Therefore, grounding cannot be reductively analysed by arranging truth-functions and quasi-identity to define a structure of non-cyclic disjunctive parthood. To understand when this structure obtains and when it does not, a notion of grounding must be available already.

²⁷ It would not help to say that a disjunctive content ($p \vee q$) is a kind of complex consisting of the contents p , q and the meaning of “ $\vee$ ”, disjunction. For the question remains of what this meaning is and what makes it the meaning of “ $\vee$ ”. Arguably, disjunction is the meaning of “ $\vee$ ” because a content ($p \vee q$) formed with it *really derives* from the disjunct contents p , q in a way that matches our inferential practice of inferring “ $p \vee q$ ” from “ p ” as well as from “ q ”. The best way to understand disjunction, it seems, is as the element or form common to contents that share this derivational profile.

It is sometimes insisted that (quasi-)identifications need no explanations but are “excellent stopping places for explanations” (Dorr, 2016: 41).²⁸ As a reply to the above problem, this misses the point. Maybe there is no explanation of why Hesperus = Phosphorus. There nevertheless seems to exist an explanation of the truth of the identification “Hesperus = Phosphorus”: of how it comes about that both terms name the same planet. Following Kripke (1980: 102–104), this explanation would mention reference-fixing for “Hesperus” and “Phosphorus” by pointing to a bright object in the evening and the morning sky, respectively, and astronomic facts. Similarly, maybe we cannot demand an explanation of why $r \equiv (p \vee q)$, for suitable instances of the sentence letters. We may nevertheless insist on an explanation of the truth of “ $r \equiv (p \vee q)$ ”: of how it comes about that “ r ” and “ $(p \vee q)$ ” express the same content. The *grue-green* contrast illustrates the fact that this question is particularly pressing for a hyperintensional framework. It certainly requires an explanation why the syntactically simple predicate “grue” expresses the same predicable as a certain overtly disjunctive predicate while nothing similar is true of “green”, although the simple and the disjunctive predicate are metaphysically equivalent in both cases. The need is even more pressing if the truth and falsity of this type of identification is to bear the weight of an analysis of grounding and essence.

More generally, the worry concerns the specification of truth-conditions for quasi-identifications and, relatedly, that of identity-conditions for contents and predicables in the proposed framework. Correia’s and Skiles’s axioms tell us that certain quasi-identifications are expected to hold due to their logical structure. For example, by Idempotence, $A \equiv (A \wedge A) \equiv (A \vee A)$. Yet the axioms fall short of determining general identity conditions. They are silent on (GRUE) and (GREEN), for example. A theory concerned with hyperintensionally individuated contents and predicables need not settle the truth-value of each single identification. But it ought to tell us something substantive about the identity-conditions of contents and predicables.

The paradigm for identity-conditions would be the extensionality axiom for sets: sets are identical just in case they have the same members. The relation of objectual identity itself is perfectly clear without the axiom, even for sets. Once it is settled which sets are referred to on the left and on the right of an identification, whether those are one set or two, it is perfectly clear whether identity obtains or not. But this does not tell us when two terms refer to one set rather than two. The general answer is that they do so just in case they specify sets with the same members, such as “ $\{2, 4\}$ ” and “ $\{1 + 1, 2 + 2\}$ ”.

Similarly, the relation of quasi-identity itself is perfectly clear. Once it is settled which items are expressed on the left and on the right of a quasi-identification, whether those are one item or two, it is perfectly clear whether quasi-identity obtains or not. But this does not tell us under what conditions two sentences or formulas express one content or predicable rather than two. The *grue-green* asymmetry suggests that for hyperintensionally individuated items, the role of membership is played by grounding: contents or predicables are quasi-identical just in case they have the same grounding

²⁸ Some identifications do seem to have explanations, though. Arguably, $E=mc^2$ is explained by the principles of special relativity.

profile.²⁹ The worry therefore is that without a pre-understood notion of grounding the framework is seriously incomplete; while once the framework is completed by the required notion of grounding, it can no longer be used to analyse grounding.

Correia (2017: 66–68) states a semantic clause for factual identifications in terms of his fitting description framework: “ $\phi \equiv \psi$ ” is true iff ϕ and ψ fittingly describe the same states. A statement fittingly describes a state just in case it describes it correctly and leaves no part of the state undescribed, so that the state is “wholly relevant” to the statement’s truth (2017: 67). The problem is that it is not straightforward to apply the notion of a fitting description in concrete cases. To account for the contrast between (GRUE) and (GREEN), one would need to say that “*a* is grue” fittingly describes *a*’s being green before or in 2030 AD, while “*a* is green” does not fittingly describe *a*’s being grue before or in 2030 AD. (Cf. Correia, 2017: 68 on what disjunctions fittingly describe.)

Plausible as this is, exactly why is it true? We apply “grue” when cognitively confronted with the first state, but likewise we apply “green” when confronted with the second state. The crucial difference seems to lie in *how* we apply “grue” as opposed to “green”. Standardly, we derive applications of “grue” from applications of “green” (before or in 2030), but not applications of “green” from applications of “grue”. Fine-grained semantic distinctions need to hook up with this kind of a derivational practice. They do so if they are distinctions in what really derives from what – in what grounds what. Being green at the right time grounds being grue. This seems to be the reason why *a*’s being grue before or in 2030 AD is not fittingly described by “*a* is green” and, perhaps, does not count as a state that could be fittingly described in the first place. Grounding seems to lie at the basis of hyperintensional distinctions.³⁰

Those are my reasons against the idea that a notion of grounding can arise from cleverly arranging purely logical notions such as quasi-identity and ordinary truth-functions. As explained in the introduction, I do not assume these considerations to contribute to a refutation of the identity-based analysis of grounding. Yet I do take

²⁹ I will leave it open whether a grounding locution should be part of the object-language of the theory or instead of the semantics for that language. Wisely, Correia (2017: 66) defends his semantic framework only as one for “formal modelling” rather than stating truth-conditions. Thus, while he offers a semantic clause for quasi-identification as well as for a locution of (representational) grounding (2017: 68), the proposal is not to ideologically reduce those locutions to states talk.

³⁰ This resembles Davidson’s suggestion that events are identical just in case they have the same causes and effects. See Horsten (2010) on this sort of impredicative identity criteria and Fine (2016) for a post-modal account. It could alternatively be suggested that contents and predicables are quasi-identical iff they have the same *essence*. I do not think that this makes a difference, because I believe that essence is a by-product of grounding structures; see the end of Sect. 9. One might think that a “structuralist”, maximally fine-grained view comes with identity-conditions independent of grounding: if one content results from applying an operation to certain items and a second content results from applying an operation to certain items and the resulting contents are the same, then the operations are the same and the argument items are the same; or formally, if $O(i_1, i_2, \dots) \equiv O'(i'_1, i'_2, \dots)$ then $O \equiv O'$, $i_1 \equiv i'_1$, $i_2 \equiv i'_2$, ... (Cf. Dorr 2016: 58–59; Williamson 2024: 135). However, the principle is applicable only to two expressions that present the structure of their contents perspicuously. It is of no help for “*grue* $\equiv$ being green before or in 2030 $\vee$ blue after that time”, where only one side presents the disjunctive structure perspicuously. So even structuralists need to say something more on identity-conditions.

them to constitute a serious challenge. Identity-theorists owe us a detailed account of how the metaphysically determinative and explanatory character of grounding should emerge from combining nothing more than quasi-identity and ordinary truth-functions. Crucially, the account must not already rely on a grounding-like notion of metaphysical derivativeness that fixes identity-conditions for hyperintensionally individuated contents and predicables.

In the introduction, I explained that the way I read Correia and Skiles, they suggest a reductive analysis of grounding in terms of quasi-identity. I consider this strong thesis the interesting one, because it promises understanding grounding in purely logical terms: quasi-identity plus truth-functions. It may nevertheless be asked whether a non-reductive reading of equating grounding with a non-cyclic logical parthood structure avoids the problems highlighted in this paper. I doubt it. For the considerations on *grue* vs *green* reveal that a systematic understanding of the proposed non-cyclic structure wholly rests on a pre-understanding of grounding.

For example, the contrast between *grue* really being disjunctive in a time-related way and *green* not being disjunctive in this way can be understood only by grasping that, in accord with our derivational practice with “grue”, *grue* is grounded disjunctively while *green* is not. We are not concerned with a family of interconnected notions that mutually elucidate each other. Instead, a pre-understood notion of grounding does all the work. We understand the truth-functions, and we understand quasi-identity. To that extent we also understand the structure of non-cyclic disjunctive parthood. Yet without a stable pre-understanding of grounding-like metaphysical derivativeness we have no idea of what it would be for that structure to obtain. For we then have no idea of what it takes for two expressions to express the same content or predicable. We have intuitions about the *grue-green* asymmetry, for example, only because we tacitly employ a grounding-like notion that links our derivational practice with “grue” to a metaphysical derivativeness of *grue* from *green*.

9 Outlook: specific grounding operations as underlying grounding and quasi-identity as a transport mechanism

The upshot of the previous section is that grounding cannot be gained by cleverly arranging truth-functions and quasi-identity. I nevertheless believe that we can draw important insights about grounding from the identity-based proposal. Both ingredients highlighted by the approach are important for a metaphysics of grounding. They only play very different roles. First, when properly understood in the present context, the truth-functions are examples of *specific* grounding operations by which grounding relations in general are generated. Secondly, quasi-identity is important for metaphysics, not as part of a generation mechanism for grounding relations, but as a *transport* mechanism for grounding. In closing this paper, I would like to suggest a program for a theory of grounding and essence based on these two insights.

Let me address the generation of grounding relations by specific grounding operations first. I have argued that quasi-identity cannot contribute as an ingredient in an analysis to the determinative and explanatory character of grounding. Therefore, if we assume that there is nevertheless a deep truth in Correia’s and Skiles’s account, it

must be the truth-functions that confer such a character to grounding. But how could harmless truth-functions be metaphysically determinative and explanatory? Recall that we worried about a non-trivial necessitating force grounding could be endowed with. Now, a non-trivial necessitation is in fact connected to truth-functions. Two contents p , q jointly logically necessitate the conjunctive content $(p \wedge q)$, and any content p logically necessitates the disjunctive content $(p \vee q)$ for any arbitrary second disjunct q .

Of course, logical necessitation cannot be the determinative-explanatory link we are after. For violating the expected asymmetry, $(p \wedge q)$ also logically necessitates its conjunct contents p , q . However, all we must do to get over this hurdle is interpreting the logical necessitation between p , q and $(p \wedge q)$ as well as between p and $(p \vee q)$ in a hyperintensional, more fine-grained and directed manner. We can say that $(p \wedge q)$ derives from p , q in a specific way, namely, by *conjoining* the facts.³¹ Likewise, $(p \vee q)$ derives from p in a specific way, by *disjoining* p with arbitrary q . Such specific and directed logical operations are not completely unheard of. Derivations in a system of natural deduction are composed of deductive steps in accordance with specific rules. Thus, “ $(p \wedge q)$ ” can be derived from “ p ” and “ q ” by the introduction rule for conjunction, and “ $(p \vee q)$ ” can be derived from “ p ” by the introduction rule for disjunction. Notably, Gentzen, the inventor of natural deduction, prioritised introduction over elimination: “The introductions represent, as it were, the ‘definitions’ of the symbols concerned, and the eliminations are no more, in the final analysis, than the consequences of these definitions.” (Gentzen, 1935: 80, §5) All we need to assume is that specific, directed grounding operations between sentential contents correspond to the introductory operations performed on sentences.

Grounding theory is essentially based on the assumption that there are more than only intensional differences between contents. In my view, it is a natural additional step to also make the relations between contents as fine-grained and differentiated as those contents. Instead of working with a single general relation of grounding, we ought to embrace as basic various specific relationships between contents that are sensitive to their hyperintensional subtleties.³² I suggest that we accept what seems obvious: that any contents p , q conjoin to form $(p \wedge q)$, and that any content p forms $(p \vee q)$ by being disjoined with an arbitrary content q , where conjoining and disjoining are specific determinative, explanatory, and thereby necessitating operations.

The follow-up question is how specific grounding operations such as conjoining and disjoining generate grounding relations in general. I want to suggest that they do so by chaining.³³ For example, p , q conjoin to form $(p \wedge q)$, and this conjunction

³¹ It might be worried that I am here switching to representational grounding. For if any p , q ground $(p \wedge q)$, it seems that p grounds $(p \wedge p)$, violating Idempotence. My view is that p does ground $(p \wedge p)$ and that I am concerned with worldly grounding nevertheless, but between highly fine-grained though worldly contents; see Sect. 2 for the distinction. Yet I do not deny coarse-grained worldly contents. Contents of different granularity can co-exist peacefully, just as sets and fusions do.

³² Thus, it can no longer be objected that grounding is too coarse-grained (Koslicki 2015).

³³ Cf. Werner’s (2022) construction “of grounding *simpliciter* [...] as a chain of immediate grounding”, which he shows to be compatible with dense grounding (2022: 25).

disjoins with arbitrary r to form $((p \wedge q) \vee r)$. Taken together, this means that p, q jointly ground $((p \wedge q) \vee r)$.

Crucially, disjoining and conjoining are only two examples of specific grounding operations. For example, natural deduction allows us to infer “ $\exists xFx$ ” from its instance “ Fa ”. Correspondingly, the standard view is that an existential generalisation $\exists xFx$ is grounded by its instances, such as Fa .³⁴ This is easily accommodated by assuming a specific grounding operation of existential abstraction that takes Fa as an input and outputs $\exists xFx$. By contrast, the identity theorist would need to say that $\exists xFx$ is factually identical to an arguably infinite disjunction of actual and possible instances $Fa, Fb, \dots$ This identification cannot be stated in Correia’s and Skiles’s finite language. And due to the lack of identity conditions highlighted in Sect. 8, it is unclear why it should hold.

Further, not all grounding operations are narrowly logical. For example, there seem to be operations of property and propositional abstraction: the fact that a is F yields the fact that a has F -ness; and a fact p yields the fact that the proposition that p is true. What lies at the basis of a general theory of grounding is the study of such specific grounding operations.³⁵

In its own way, this chaining-of-specific-operations account adopts one part of J. Wilson’s (2014: section II) attack on grounding theory: it is the different specific, “small-g” grounding operations that do real determinative and explanatory work in metaphysics, not a single general “big-G” relation of grounding. Still, the chaining account additionally acknowledges the importance of a general notion of grounding. We can have evidence that some items ground another without being able to specify the grounding chain in detail. Then we need a general notion to state the explanatory determination. (Cf. Sider, 2020 13–15.) Rejecting another part of Wilson’s (2014: section V) attack, my view is that the different specific grounding operations are similar enough in character to permit a general notion of metaphysical determination and explanation of which they are all specifications.

The chaining account of grounding also resembles K. Bennett’s (2017) view that a variety of “building relations” spans the world’s metaphysical hierarchy. However, I hold that the relevant relations are all species of grounding. Also, grounding operations do not only help constitute the actual world. They are *worlds-building* in the wider sense that they complete any possible fundamental reality to a possible world at large. This is how they are necessitating due to their determinative-explanatory character. For example, the conjoining operation guarantees that every possible world that contains the contents *It is raining* and *It is freezing* also contains the content *It is raining and freezing*, so that the grounds necessitate the groundee.

Finally, the account resembles Fine’s (2010b) approach to define parthood by chaining steps of composition of various specific forms, which he characterises as generative operations. Surprisingly, he does not connect this to his view of grounding (2012).

³⁴ Well-known puzzles (Fine 2010a) suggest, however, that this view is not entirely correct.

³⁵ An early study of logical grounding is Correia (2014). See (2014: 33) for a parallelisation of grounding relations with introduction rules for truth-functions.

To what extent is the chaining account a competing reductive analysis of grounding? It can be viewed as suggesting a conceptual analysis of grounding-in-general in terms of immediate grounding. Immediate grounding, however, is a conceptual primitive we understand by grasping various specific grounding operations and recognising their common non-causal determinative-explanatory character. Immediate grounding only *metaphysically* reduces to the specific operations, by immediate grounding being generically grounded by disjoining, by conjoining, and so on.

Secondly, let me explain what I mean by quasi-identity functioning as a transport mechanism for grounding. Often when we ask concerning a philosophically interesting phenomenon “What is X?”, we seem to ask for an informative identification concerning X; just as when we ask, “Who is N.N.?”, we expect an informative identification concerning N.N.³⁶ As we observed regarding *grue*, grounding relations play an important role in confirming such identifications.

Suppose we ask, “What is *grue*?”, and venture the hypothesis

(H) *Grue* $\equiv$ (being green before or in 2030 AD $\vee$ being blue after 2030 AD)

How can we confirm this identification? Plausibly, we know apriori that the predicable expressed on the right has a certain grounding profile:

(T) (Being green before or at 2030 AD $\vee$ being blue after 2030 AD) is grounded in a disjunctive manner by being green before or in 2030 AD and by being blue after 2030 AD.

(T) is a transparent grounding statement, because its subject term presents the disjunctive predicable transparently *as* the result of disjoining being green before or in 2030 AD with being blue after 2030 AD.³⁷ The identificatory hypothesis (H) allows us to infer from (T) the corresponding grounding statement regarding the predicable expressed on the left of (H):

(O) *Grue* is grounded in a disjunctive manner by being green before or at 2030 AD and being blue after 2030 AD.

(O) is opaque, because the grounded predicable is not expressed transparently but by a single word “*grue*” that fails to reveal a grounding profile. Yet it is (O) that we can check directly. For we can be sure in advance, by disquotation, that *grue* is expressed by our predicate “*grue*”. And we can compare the disjunctive grounding structure of the predicate’s meaning stated in (O) with our disjunctive practice with the predicate: the fact that we (now) derive applications of “*grue*” from applications of “*green*”. It is our identificatory hypothesis (H) that allows us to transport the grounding profile transparently stated in (T) to the opaque but testable grounding

³⁶ Unlike Correia (2017: 53), I do not take informative identifications to be essentialist statements. They are just that, informative identifications. Following Fine (2015), I think that essentialist statements link one item to *another* that is in a certain way determinative and explanatory of it, as in “It is essential to being a bachelor to be male.” “What is X?”-questions sometimes demand identificatory and sometimes essentialist answers.

³⁷ Cf. Correia’s (2017) somewhat similar notion of a perspicuous description.

statement (O). Notably, this transport role of (H) does not require any necessitating force of quasi-identity.

Having been focused on grounding, let me close with an approach to essence. Once specific grounding operations are available, it seems that essence can be understood as a by-product of the totality of grounding facts. For example, *It is raining* is not only part of a joint ground of *It is raining and it is freezing*. There is also no way to ground the conjunctive content without *It is raining*. This is what makes *It is raining* essential to the conjunction. Likewise, on each way for $(p \wedge r) \vee (q \wedge r)$ to be grounded, r is among the grounds, either in p, r or in q, r . This is what makes r essential to the disjunction of conjunctions. (Cf. Correia's, 2014: 34 "TREES".) More generally, an essential feature of an item is a *requirement* of it in the sense of being present in *all* ways for the item to be grounded.³⁸ We may additionally embrace a collateral variant of metaphysical requirement: truth may be essential to knowledge, not by p plus some factor X being the full ground of knowledge of p but by p being grounded by some part of every full ground of knowledge of p (cf. Glazier, 2022: 18–19 on Rosen's problem).

10 Conclusion

My critical examination of the identity-based analysis of grounding as well as essence was done with a constructive intent. The goal was to distil important insights of the approach that could serve as a basis for an adequate account of grounding as well as essence. Correia and Skiles suggest an analysis of the two notions in terms of purely logical notions: truth-functions, specifically disjunction and conjunction, and higher-order versions of identity. Focusing on grounding, the ingredient and the arrangement argument provided reasons for doubting that such an analysis is convincing. Indeed, one might have been sceptical from the start that powerful post-modal tools might enjoy an analysis in quite elementary logical terms. Nevertheless, two crucial insights are connected to the authors' emphasis on truth-functions on the one hand and generalised or quasi-identity on the other. First, disjunction and conjunction do lie at the basis of grounding. However, those notions need then to be construed as two specific grounding operations: disjoining and conjoining, which are only examples of the many specific grounding operations we ought to recognise. The general relation of grounding results from chaining those operations. Secondly, quasi-identity plays an important role regarding grounding. It is not involved in the generation of grounding relations. Grounding is generated exclusively by chaining specific grounding

³⁸ A consequence is that metaphysically fundamental items have no essences. Essence is no less a notion of metaphysical priority than grounding, with the essential features being prior to what they are essential to; and nothing is metaphysically prior to a fundamental item (cf. Busse 2022; Wang 2019). Identity-theorists may claim that electrons are both fundamental and essentially charged, because being a particular electron is quasi-identical to being that electron and being charged. Yet I see no basis for this identification. Suppose, however, that only a pointillist Humean mosaic is fundamental (for a nominalist view see Busse 2018). Being persisting particles, electrons could then receive essences that might include their charge by being suitably grounded by the mosaic (see Busse 2023: Sect. 4.4, n. 32 in particular for a Humean approach to quantum particles).

operations. Yet quasi-identity serves as a crucial transport mechanism for grounding from transparent cases, such as that p grounds $(p \vee q)$, to opaque cases, such as that p grounds r , given that r is quasi-identical to $(p \vee q)$. I hope to be able to deliver at least parts of a post-modal framework based on those insights in future work.

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