

Defining Qualitative Properties

Vera Hoffmann-Kolss¹

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Abstract The aim of this paper is to provide a systematic account of the metaphysically important distinction between haecceitistic properties, such as *being David Lewis* or *being acquainted with David Lewis*, and qualitative properties, such as *being red* or *being acquainted with a famous philosopher*. I first argue that this distinction is hyperintensional, that is, that cointensional properties can differ in whether they are qualitative. Then I develop an analysis of the qualitative/haecceitistic distinction according to which haecceitistic properties are relational in a certain sense. I argue that this analysis can capture the hyperintensionality of the qualitative/haecceitistic distinction and is generally in accordance with the use of the notion of a qualitative property in philosophical debates.

1 The Metaphysical Significance of the Qualitative/Haecceitistic Distinction

What does it mean to say that two numerically distinct individuals are qualitatively identical? Usually, qualitative identity is defined in terms of qualitative properties: individuals are qualitatively identical if and only if they have exactly the same qualitative properties. Qualitative properties, such as *being red*, *being acquainted with a famous philosopher* or *being self-identical*, are properties which do not involve any concrete particular individuals. They can be contrasted with haecceitistic (or non-qualitative) properties, which do involve particular individuals.

✉ Vera Hoffmann-Kolss
vera.hoffmann-kolss@uni-koeln.de
https://www.hoffmann-kolss.de

¹ Institute of Philosophy, University of Cologne, Albertus-Magnus-Platz, 50923 Cologne, Germany

Paradigmatic examples of haecceitistic properties are *being David Lewis*, *being acquainted with David Lewis*, and *being David Lewis's mother*.

When discussing questions of identity and individuation, it is often tacitly assumed that the distinction between qualitative and haecceitistic properties can be drawn in an adequate way. For instance, arguments involving the principle of the identity of indiscernibles, that is, the claim that x and y 's sharing all their *qualitative* properties implies that x is identical to y , will be problematic if the class of qualitative properties remains undefined. Likewise, definitions of haecceitism usually rely on the notion that there are numerically distinct individuals or possible worlds that are *qualitatively* exactly alike (Lewis 1986, 221; Fara 2009, 288).

The qualitative/haecceitistic distinction appears in other philosophical debates as well. It can be traced back to Hempel and Oppenheim's account of scientific explanation, according to which successful explanations invoke natural laws and natural laws are supposed to be universal statements containing only purely qualitative predicates (Hempel and Oppenheim 1948, 156). Even though Hempel and Oppenheim apply the distinction to predicates, rather than properties, their account can easily be translated into the metaphysical thesis that laws of nature should contain only qualitative properties. Again, such a thesis cannot be reasonably maintained (or disputed) if it is unclear what qualitative properties are.

Moreover, supervenience theses are usually restricted to qualitative properties (Horgan 1982, 37–38; Bennett 2004, fn. 8, fn. 30). The common idea underlying the various notions of supervenience is that properties of type A supervene on properties of type B iff any individuals x and y that have the same B-properties must have the same A-properties. However, many haecceitistic properties cannot be instantiated by several individuals. The property of *being David Lewis*, for example, is, of necessity, instantiated by David Lewis and no other individual, and the same holds for the property of *being David Lewis's mother*. But if the set of B-properties contains properties that cannot be instantiated by several individuals, then the condition that different individuals x and y instantiate exactly the same B-properties cannot be satisfied and supervenience claims are threatened with trivialization.

However, even though the distinction between qualitative and haecceitistic properties appears to have a wide field of application, there have been surprisingly few attempts to define it. Obviously, an analysis of the qualitative/haecceitistic distinction should comply with the use of the notion of a qualitative property in philosophical discourse and classify exactly those properties as qualitative which are considered qualitative by the philosophers using them. As I will argue below, one consequence of this requirement is that an adequate criterion of the qualitative/haecceitistic distinction will heed the observation that the distinction is sensitive to hyperintensional differences among properties. The aim of my argument therefore is to develop a hyperintensional analysis of the qualitative/haecceitistic distinction that can be used to ground other metaphysical notions.

The structure of this paper is the following: I begin by arguing that the qualitative/haecceitistic distinction is hyperintensional (Sect. 2). Then I discuss two existing accounts of the distinction: a definition developed by Rosenkrantz (Sect. 3), and a relational account suggested by Loux (Sect. 4) and argue that they both are problematic if cointensional properties falling on different sides of the qualitative/

haecceitistic divide come into play. Finally, I introduce a modified relational criterion, argue that it improves on its predecessors (Sect. 5), and conclude by discussing a possible objection to my approach (Sect. 6).

Some authors reserve the term ‘haecceitistic property’ for haecceities or thisnesses, that is, properties uniquely associated with a particular individual, such as *being (identical to) David Lewis* (e.g. Caulton and Butterfield 2012, 34). In the present context, however, I use the notion in a broader sense and define a property as haecceitistic iff it is not qualitative. Understood in this way, the qualitative/haecceitistic distinction can be equated with the distinction between pure and impure properties suggested by a number of authors (Loux 1978, 133; Rosenkrantz 1979; Khamara 1988, 145–146; Humberstone 1996, 210; Langton and Lewis 1998, 334–335). Therefore, I assume that the terms ‘haecceitistic property’ and ‘impure property’ can be used synonymously and that the same holds for the terms ‘qualitative property’, ‘purely qualitative property’, and ‘pure property’.

Furthermore, I assume that the qualitative/haecceitistic distinction as I define it applies to first-order properties only. There might be second-order haecceitistic properties, such as *having the property of being identical to David Lewis*, which can be distinguished from second-order qualitative properties, but these rarely play a crucial role in philosophical debates invoking the qualitative/haecceitistic distinction, and I will therefore leave them aside.

2 Sensitivity to Hyperintensional Differences

Consider properties of the form *being a*, such as *being David Lewis* or *being Hilary Putnam*. It is widely agreed that if such properties exist, then they are paradigm cases of haecceitistic properties. But the individual *a* could have a qualitative essence, a combination of qualitative properties, call it *E*, which *a* instantiates at every possible world where *a* exists and which is not instantiated by any possible individual other than *a* (for an account of qualitative essences, see Adams 1981, 3–5). In that case, *being a* and *E* are cointensional: necessarily, for all individuals *x*, *x* is identical to *a* iff *x* has *E*. Given that *being a* is a paradigmatic example of a haecceitistic property, while *E* is *per definitionem* qualitative, this implies that there are cointensional properties only one of which is qualitative. It follows that the qualitative/haecceitistic distinction is hyperintensional: there are cointensional properties, one of which is haecceitistic, whereas the other one is qualitative. (See Eddon 2011, 321–322, for a similar observation.)

Obviously, this argument crucially depends on the existence of qualitative essences. If no individual has a qualitative essence and if all qualitative properties can be instantiated by several individuals, then the argument is not sufficient for concluding that the qualitative/haecceitistic distinction is sensitive to hyperintensional differences. However, there are other arguments which do not rely on this assumption. It is widely agreed, for instance, that some qualitative properties cannot be contingently had by any individual. A possible example is the property of *being an electron*. If *being an electron* is non-contingent, then there is no individual that is an electron at one possible world, but fails to be an electron at a different possible

world. Let a_1, a_2, a_3, \dots be a list of all and only those possible individuals that are electrons. Given that no individual can be an electron at one world, but fail to be an electron at a different world, it is possible to find such a list. But then the haecceitistic property of *being a_1 or being a_2 or being a_3 or...* is cointensional with *being an electron*: both properties are instantiated by exactly the same possible individuals, that is, all members of the list a_1, a_2, a_3, \dots . Again, it follows that there are cointensional properties, one of which is haecceitistic, whereas the other one is qualitative (see also Hoffmann-Kolss 2015, 244–245).

One might still try to avoid the conclusion that the qualitative/haecceitistic distinction is hyperintensional by rejecting the metaphysical assumptions underlying this example, notably the assumption that there are infinitely disjunctive properties involving non-actual individuals and the assumption that properties such as *being an electron* are non-contingent (for a criticism of the latter assumption see Mackie 2006). However, not even these assumptions are needed to argue for the hyperintensionality of the qualitative/haecceitistic distinction.

Consider, for instance, the property of *being a duplicate of David Lewis_@*, defined as the property instantiated by x iff x has exactly those intrinsic qualitative properties that David Lewis has at the actual world @. This property is cointensional with the conjunction of all intrinsic qualitative properties that David Lewis instantiates at the actual world, call it ' Q '. But Q is qualitative, whereas *being a duplicate of David Lewis_@* is haecceitistic.¹ An analogous example is the haecceitistic property of *having the same color as the Chinese flag_@* (understood as *having the color which the Chinese flag actually has*), which is cointensional with the qualitative property of *being red*.

Therefore, an adequate analysis of the qualitative/haecceitistic distinction should take the hyperintensionality of this distinction into account. This rules out Lewis's approach to defining the distinction, according to which a property is qualitative iff it supervenes on the perfectly natural properties and relations (Lewis 1986, 62–63; Bricker 2008, fn. 24; Teller 1983, 148; McDaniel 2007, fn. 17; Eddon 2011, 320). For given that the notion of supervenience is not sensitive to hyperintensional differences, such an account is not compatible with the Hyperintensionality of the qualitative/haecceitistic distinction.

It should be noted, however, that the hyperintensionality of the qualitative/haecceitistic distinction does not imply that the distinction applies to linguistic entities, that is, predicates, rather than properties. In an influential paper, Nolan argues that, in some cases, hyperintensionality should be considered a phenomenon in the world rather than a matter of our (linguistic) representation of the world and points out that this holds for the distinction between intrinsic and extrinsic

¹ The conclusion that Q and *being a duplicate of David Lewis_@* are distinct properties falling on different sides of the qualitative/haecceitistic divide could be avoided if *being a duplicate of David Lewis_@* was either identical to Q or did not count as a genuine property at all. It is not clear, however, why *being a duplicate of David Lewis_@* should be disqualified from being genuine if properties such as *being acquainted with David Lewis* or *being David Lewis's mother* qualify as genuine, which seems to be an implicit assumption of the debate on the qualitative/haecceitistic distinction. Moreover, *being a duplicate of David Lewis_@* seems to be intuitively distinct from *being a duplicate of Jimmy_{w₁}* (that is, having the intrinsic qualitative properties that Jimmy has at w_1), even if Jimmy has Q at w_1 . But this implies that neither of these properties should be identified with Q .

properties as well as for the individuation of properties in general (Nolan 2014, 155–158). It is plausible to assume that the same holds for the qualitative/haecceitistic distinction. *Being a duplicate of David Lewis*_@ and *Q*, for instance, are distinct properties falling in distinct metaphysical categories, and not just different ways of picking out the same property. The purpose of this paper is to analyze the metaphysical distinction between qualitative and haecceitistic properties, which is relevant to several metaphysical debates, and not the possibly related distinction between qualitative and haecceitistic predicates (for analyses of the latter, see Hempel and Oppenheim 1948, 156; Goldstick 1986, 71–72).²

3 Rosenkrantz's Account

The intuition underlying Rosenkrantz's definition of the qualitative/haecceitistic distinction is that the instantiation of a haecceitistic property typically presupposes the existence of one or several concrete individuals, whereas the instantiation of a qualitative property does not have any such implications. *Being David Lewis* and *being acquainted with David Lewis* should be classified as haecceitistic because they could not be instantiated if David Lewis did not exist. This leads to the notion that haecceitistic properties have individuals as concrete constituents:

The property *F* has *x* as a concrete constituent = df. *F* is a property such that:

- (i) *F* is possibly instantiated, and (ii) *F* is necessarily such that if it is instantiated, then *x* exists at some time, and (iii) *x* is a contingently existing concrete object (Rosenkrantz 1979, 518).

According to condition (ii), a property *F*'s having an individual *a* as a concrete constituent implies that *a* exists if *F* is instantiated. Condition (i) excludes contradictory properties, which cannot be instantiated by any individual. For if *F* was such a property, condition (ii) would be vacuously fulfilled. Thus, any contradictory property would have any individual as a concrete constituent, which appears implausible. Condition (iii) ensures that only contingent concrete individuals, such as material objects, persons, particular events, and particular times and places, are constituents of properties, while abstract entities, such as universals, sets and numbers, are not (Rosenkrantz 1979, 519).

² An account that relies on linguistic considerations to define the metaphysical distinction between qualitative and haecceitistic properties has been proposed by Adams. According to Adams, a property is haecceitistic iff it cannot be expressed without the use of terms typically referring to concrete individuals, such as proper names or indexical expressions (Adams 1979, 7). Adams himself points out, however, that such a definition 'may be suspected of circularity, on the ground that the distinction between qualitative and nonqualitative might be prior to' the notion of a linguistic expression typically referring to concrete individuals and that considering haecceitistic properties a particular type of relational property (the approach defended in the present paper) might be the 'more illuminating approach' (Adams 1979, 7–8). I therefore assume that Adams's criterion should be understood as a useful intuitive elucidation of the qualitative/haecceitistic distinction, rather than as a strict definition. It should be noted, however, that Adams's account is widely accepted as a working definition of qualitative properties, particularly in the debate on haecceitism (Legenhausen 1989, 625–626; Diekemper 2009; Fara 2009, 286).

The haecceitistic property of *being acquainted with David Lewis* has David Lewis as a concrete constituent, since David Lewis is a contingent concrete object and exists if someone instantiates *being acquainted with David Lewis*. The same holds for *being David Lewis*. However, the class of haecceitistic properties cannot simply be equated with the class of properties having contingent objects as concrete constituents. For instance, the disjunctive property of *being identical to David Lewis or identical to Hilary Putnam* is intuitively haecceitistic, but does not have any individual as a concrete constituent, since its instantiation implies neither the existence of David Lewis nor the existence of Hilary Putnam.

Rosenkrantz is aware of this problem and draws a distinction between basic haecceitistic properties and properties that are haecceitistic *simpliciter*. He first defines a property as basic haecceitistic (or basic impure in his terminology) iff it has some actual or non-actual individual as a concrete constituent, that is, iff its instantiation at some possible world entails the existence of some concrete individual at this world. He then points out that a metaphysical theory of properties will typically specify which recursive rules can be used to generate complex properties out of simple properties. For instance, a metaphysical theory of properties should state whether negative, conjunctive and disjunctive properties, properties of the form of *being such that $\exists xPx$* , properties of the form *being identical with P* , and properties of the form *being possibly P* (where P is a property in each of these cases) count as genuine properties. Given such a set of recursive rules, a property can be defined as haecceitistic iff it is either basic haecceitistic or can be generated out of basic haecceitistic properties according to those rules (Rosenkrantz 1979, 521–523). This modified definition implies that if disjunctions of properties qualify as properties according to the underlying metaphysical account of properties, *being identical to David Lewis or identical to Hilary Putnam* is correctly classified as haecceitistic, since it contains basic haecceitistic properties as truth-functional components.

However, Rosenkrantz's approach faces difficulties as well. One problem is that a good account of the qualitative/haecceitistic distinction should be neutral on the question whether or not individuals have qualitative essences. As pointed out at the beginning of this paper, a definition of the qualitative/haecceitistic distinction should be usable as the basis of other metaphysical debates, notably debates on identity and haecceitism. A definition that already presupposes an important result of these debates does not satisfy this important requirement. Rosenkrantz's account is problematic precisely because it cannot be neutral on the question whether there are qualitative essences: it will yield inadequate results if the answer to that question is positive. For the instantiation of a qualitative essence always implies the existence of some contingent concrete individual, that is, of the individual whose essence is being instantiated. It follows that if there are qualitative essences, they will be misclassified as haecceitistic by Rosenkrantz's account.

A second problem is that Rosenkrantz's account does not provide a sufficient condition of a property's being qualitative. To see this, consider the following three haecceitistic properties: *being David Lewis's counterpart*, *hallucinating the Eiffel Tower* and *being a figment of Joanne K. Rowling's imagination*. All these properties are such that their instantiation does not imply the existence of a concrete

individual. The instantiation of *being David Lewis's counterpart* by some individual at some possible world w is compatible both with the existence and the non-existence of David Lewis at w , and the same holds for *hallucinating the Eiffel Tower*, which could be instantiated by an individual inhabiting a world in which the Eiffel Tower does not exist. The third property will be instantiated at worlds populated by fictional creatures, and at least some of those worlds are such that the real Joanne K. Rowling does not exist in them. Thus, none of these three properties is defined as basic haecceitistic according to Rosenkrantz's criterion.

It follows that these properties will only be correctly classified as haecceitistic if they can be understood as complex properties which can be recursively generated out of basic properties. However, these properties do not seem to be logically complex. They consist of a logically simple two-place relation R and a concrete individual a . Pointing out that they are logically equivalent to some properties that can be generated out of basic haecceitistic properties would be of no avail either, since any property P is logically equivalent to such a property, for instance, to the property of *being either P and identical to David Lewis or P and not identical to David Lewis* (i.e. $(P \ \& \ \text{identical to David Lewis}) \vee (P \ \& \ \neg\text{identical to David Lewis})$). Excluding the problematic properties by restricting the scope of the criterion to properties involving relations between individuals inhabiting the same possible world would deprive the Rosenkrantz's account of its generality.

I therefore conclude that Rosenkrantz's account face two major difficulties: it is not neutral on whether or not individuals have qualitative essences and it is committed to classifying some intuitively haecceitistic properties as qualitative. The relational account developed in the next two sections is designed to circumvent these difficulties.

4 Loux's Relational Account

Relational accounts of the qualitative/haecceitistic distinction rely on the intuition that something instantiates a haecceitistic property iff it stands in a certain relation to a particular individual. Loux proposes the following relational criterion of the distinction between pure and impure properties (i.e. between qualitative and haecceitistic properties):

... we say that a property, P , is impure just in case there is some relation, R , and some substance, s , such that necessarily, for any object, x , x exemplifies P if and only if x enters into R with s and that a property, P , is pure just in case P is not impure (Loux 1978, 133; for a similar notion see Adams 1979, 7–8).

Using the terminology employed in the present paper, Loux's definition can be reformulated as follows (here and in the rest of the paper, I assume that 'possible individual' is to be understood as 'actual or non-actual but possible individual'):

(RC)₁ A property P is haecceitistic iff there is a two-place relation R and a possible individual a , such that for all possible individuals x , x has P iff x stands in R to a . Otherwise, P is qualitative

Being acquainted with David Lewis is correctly classified as haecceitistic by $(RC)_1$, since there is a two-place relation R , namely the *acquaintance* relation, and an individual, David Lewis, such that for every possible individual x , x is acquainted with David Lewis iff x stands in R to David Lewis. *Being David Lewis's counterpart* is classified as haecceitistic, since there is a possible individual, David Lewis, such that for all possible individuals x , x is David Lewis's counterpart iff x stands in the *counterpart* relation to David Lewis. And it should be obvious that an analogous consideration holds for *having the same color as the Chinese flag*.³

Therefore, $(RC)_1$ complies with a number of intuitions about the qualitative/haecceitistic distinction. However, like the accounts discussed in the previous sections, it cannot adequately deal with cointensional properties falling on different sides of the qualitative/haecceitistic divide. To see this, assume that P is classified as haecceitistic by $(RC)_1$ and that Q is cointensional with P . Then there is a relation R and a possible individual a , such that for all possible x , Px iff Rxa . The cointensionality of P and Q implies that for all possible x , Qx iff Px , which in turn implies that for all possible x , Qx iff Rxa . It follows that Q is classified as haecceitistic iff P is. (For a related worry, see Khamara 1988, 146; see also Humberstone 1996, 218.)

An additional problem is that $(RC)_1$ can be trivialized if the relation R is defined in a certain way. Consider, for instance, R_1 and R_2 :

$$R_1xy := \text{either } Px \text{ and } x \text{ coexists with } y \text{ or } Px \text{ and } x \text{ does not coexist with } y, \text{ i.e. } (Px \ \& \ x \text{ coexists with } y) \vee (Px \ \& \ \neg x \text{ coexists with } y)$$

$$R_2xy := Px \text{ and } y = y$$

The logical structure of R_1 implies that any property P satisfies $(RC)_1$ if R is equated with R_1 . Moreover, given that every possible individual is self-identical, the same holds if R is equated with R_2 . And it should be obvious that analogous problem cases are easy to generate.

Therefore, as it stands, $(RC)_1$ does not provide an adequate analysis of the qualitative/haecceitistic distinction. In the next section, I argue, however, that $(RC)_1$ can be used as the basis of a more elaborate relational criterion which avoids these problems.

³ An immediate objection to this criterion is that it involves non-standard logical notions, that is, relations holding between individuals inhabiting distinct possible worlds and quantifiers whose domains contain actual and non-actual individuals. However, this is rather common for definitions of metaphysical notions and does not per se render them inadequate. One example is the following definition of strong supervenience frequently employed in the debate on the mind-body relation: A-properties supervene on B-properties iff for any individuals x and y inhabiting the same or different possible worlds, if x and y have the same B-properties, they have the same A-properties (see, e.g., Kim 1987, 317). Another pertinent example is the definition of an intrinsic property as one that cannot differ between duplicates, that is, between actual or non-actual individuals standing in the duplication relation to each other (see, e.g., Langton and Lewis 1998, 337).

5 A Modified Relational Account

One possibility to amend Loux's relational criterion has been proposed by Khamara, who suggests the following definition of the qualitative/haecceitistic distinction (that is, of the pure/impure distinction in his terminology):

A property, P , is impure if and only if there is at least one individual, y , such that, for any individual, x , x 's having P consists in x 's having a certain relation to y (Khamara 1988, 145).

Prima facie, this criterion can handle the cases raising problems for $(RC)_1$. *Having the same color as the Chinese flag*_@ consists in standing in the *same-color-as* relation to the actual Chinese flag, but that does not hold for the property of *being red*. Moreover, having the property P does usually not consist in standing in one of the relations R_1 and R_2 to some arbitrary individual.

However, Khamara's account relies entirely on the validity of our intuitions about the *consists-in* relation, and these may not be shared in all cases. For instance, even if one takes for granted that having the property of *being a* consists in standing in the *identity* relation to a , proponents of qualitative essences might claim that having E , the qualitative essence of a , also consists in standing in the *identity* relation to a , in which case E would be misclassified as haecceitistic. Whether or not Khamara's criterion is committed to this counterintuitive result could only be decided if it were supplemented by a more detailed characterization of the *consists-in* relation, which Khamara does not provide.⁴

Nonetheless, his approach points in the right direction. As indicated above, the primary aim in analyzing the qualitative/haecceitistic distinction is to make the intuitions underlying this distinction as used in philosophical debates explicit. One crucial intuition justifying the claim that *being a* is haecceitistic, seems to be that no further assumptions are needed to justify the claim that for all possible x , x has *being a* iff $x = a$. Showing that for all possible x , x has the qualitative property E iff $x = a$, by contrast, requires an additional metaphysical assumption, namely the assumption that E is the qualitative essence of a . Analogously, *having the same color as the Chinese flag*_@ is intuitively regarded as haecceitistic, because no further assumptions are needed in order to show that for all possible x , x has this property iff x stands in the *same-color-as* relation to the actual Chinese flag. However, showing that for all possible x , x is red iff x stands in the *same-color-as* relation to the Chinese flag requires the additional assumption that the Chinese flag is actually red. The following amended criterion $(RC)_2$ relies on this consideration:

⁴ According to Francescotti, the *consists-in* relation can be accounted for in terms of event identity. x 's having P consists in x 's standing in R to y iff x 's having P is the same event as x 's standing in R to y (Francescotti 1999, 599). The difficulty with this approach is to provide a criterion of event individuation which is sensitive to hyperintensional differences without having to presuppose the qualitative/haecceitistic distinction itself (see, however, Francescotti 2014, 190–191, for discussion). An alternative option might be to account for the *consists-in* relation in terms of the grounding relation. A more detailed discussion of both options would go beyond the scope of the present paper and will have to be postponed to a different occasion.

(RC)₂ A property P is haecceitistic iff there is a two-place relation R such that:

- (i) There is a possible individual a , such that for all possible x , x 's having P is logically equivalent to x 's standing in R to a .
- (ii) It is logically possible that there is an individual having the existential derivative of R but not P .

Otherwise, P is qualitative.

(RC)₂ contains several notions that require elucidation. The first is the notion of logical equivalence occurring in condition (i). Given that the criterion is supposed to be sensitive to hyperintensional distinctions, this notion cannot be understood as coextensionality in all possible worlds (as in (RC)₁). It is a rather common view among metaphysicians, however, that necessity comes in various strengths, for instance, that there is a notion of nomological necessity which is different from and weaker than the notion of metaphysical necessity (Vaidya 2015). Moreover, it is widely agreed that there is a still stronger notion of logical necessity, such that all logically necessary states of affairs are metaphysically necessary (and also nomologically necessary), but the opposite does not hold (Lange 2009, 87; Vaidya 2015).

If the notion of logical necessity is, hence, stronger than all other kinds of necessity, a logically necessary proposition can be understood as a proposition that continues to be true under a maximally broad range of 'counterfactual perturbations' (Lange 2005, 291), including violations of metaphysical principles. For instance, if water did not have the chemical structure H_2O , if David Lewis had been born of different parents and if the world was populated with creatures taller than themselves, the proposition that everything is either red or non-red would still be true. The latter proposition would only be false if the fundamental laws of logic themselves were denied, for instance, if the law of excluded middle did not hold true.

Lange uses these considerations to formulate the following account of logical equivalence: define the set of logically necessary propositions as the smallest non-empty set of propositions which is stable in the following sense: (i) every member of the set is true, and (ii) if A is a member of the set, then A would continue to be true if B was true, for all propositions B whose negation is not a member of the set (Lange 2005, 285–286; for a similar account see also Kment 2006, 245–252). One can then define a proposition A as logically equivalent to a proposition B iff the proposition that A iff B is logically necessary in the sense specified by Lange. This is how the notion of logical equivalence occurring in (RC)₂ is to be understood.⁵

This notion of logical equivalence is stronger than coextensionality in all possible worlds and ensures that, in contrast to (RC)₁, (RC)₂ is sensitive to hyperintensional differences. To see this, suppose that B is the proposition that the Chinese flag is actually green. The negation of this proposition does not belong to the smallest set

⁵ The account originally proposed by Lange refers to sentences rather than propositions. However, since it can be argued that necessity is primarily a property of propositions (McGrath 2014) and since considering propositions instead of sentences does not change the general structure of Lange's account, this modification does not seem to be problematic.

of propositions which is stable in the sense defined by Lange. However, if the Chinese flag was actually green, the proposition that for all possible x , x is red iff x has the same color as the Chinese flag_@, would be false. Therefore, the latter proposition is not logically necessary. Accordingly, an individual's being red is not logically equivalent to its standing in the *same-color-as* relation to the actual Chinese flag, and condition (i) of $(RC)_2$ is violated.

Analogous reasoning holds for other pairs of cointensional properties falling on different sides of the qualitative/haecceitistic divide, such as *being a* and E . If F is one of the conjuncts of E and B is the proposition that a does not have F , the negation of B is not a member of the smallest set of propositions stable in Lange's sense. However, if a did not have F , a could not have E either, and the proposition that for all possible x , x has E iff x stands in the *identity* relation to a would be false. It follows that an individual's having E is not logically equivalent to its standing in the *identity* relation to a .

Accordingly, condition (i) renders $(RC)_2$ sensitive to hyperintensional differences. However, as pointed out in the previous section, $(RC)_1$, $(RC)_2$'s predecessor criterion, faces a second difficulty, that is, the problem that every property will be classified as haecceitistic if R is equated with relations such as R_1 and R_2 . Condition (ii) of $(RC)_2$ is supposed to solve this problem. The notion of logical possibility occurring in this condition is to be understood as the dual of the notion of logical necessity specified above. The *existential derivative* of a two-place relation R is defined as the property of *standing in R to something*, that is, the property instantiated by x iff $\exists yRxy$ (this notion is introduced by Hawthorne, see Hawthorne 2001, 399).⁶ In particular, the existential derivative of R_1 is the property had by x iff $\exists y((Px \ \& \ x \text{ coexists with } y) \vee (Px \ \& \ \neg x \text{ coexists with } y))$, and the existential derivative of R_2 is the property had by x iff $\exists y(Px \ \& \ y = y)$. The crucial point is that it is logically impossible for x to have one of these properties without instantiating P . Accordingly, condition (ii) is not satisfied, and this blocks the consequence, raising trouble for $(RC)_1$, that every property P will be classified as haecceitistic if R is equated with either R_1 or R_2 .⁷

To see that $(RC)_2$ can still adequately deal with standard haecceitistic properties, consider again the property of *being acquainted with David Lewis*. If R is equated with the *acquaintance* relation, then for all x , x 's being acquainted with David Lewis is logically equivalent to x 's standing in R to David Lewis: the proposition that for all x , x is acquainted with David Lewis iff x stands in the *acquaintance* relation to David Lewis would not be false even if metaphysical claims or principles were violated. Therefore, the property satisfies condition (i). At the same time, there are individuals who are acquainted with someone and consequently instantiate the existential derivative of R without being acquainted with David Lewis. Accordingly,

⁶ There are always three possibilities to form the existential derivative of a two-place relation R : the existential derivative of R is either the property which x has iff $\exists yRxy$ or the property instantiated by x iff $\exists yRyx$ or the property instantiated by x iff $\exists y\exists zRyz$. In what follows, the term 'the existential derivative of R ' always refers to the first property.

⁷ This way of blocking counterexamples to $(RC)_1$ is structurally similar to the procedure of 'generalizing out' non-essential individuals which Fine employs when defining the notion of consequentialist essence (Fine 1995, 277–278).

condition (ii) is satisfied, too. Analogous reasoning holds for properties such as *being David Lewis*, *being David Lewis's mother* and *being a duplicate of David Lewis*_@.

Unfortunately, $(RC)_2$ does not yet provide a fully adequate analysis of the qualitative/haecceitistic distinction. Consider the property of *being self-identical*, a paradigmatic example of a qualitative property. Since no possible individual can fail to be identical to itself, this property will never satisfy condition (ii), no matter how R is defined, and is, hence, correctly classified as qualitative. The problem is, however, that the negation of this property, call it ' N ', is also qualitative, but misclassified as haecceitistic by $(RC)_2$. To see this, suppose R_3 is defined as follows:

$$R_3xy := y \neq \text{David Lewis}$$

The existential derivative of R_3 is the property had by x iff there is some individual which is not identical to David Lewis. Since it is possible that some individual has this property while failing to have N (since no possible individual has N), condition (ii) is satisfied. Moreover, given that propositions of the form $x \neq x$ are logical falsehoods, there is an individual, David Lewis, such that Nx is logically equivalent to x 's standing in R_3 to David Lewis. Therefore, condition (i) is satisfied, too, and N , the property of *not being self-identical*, is indeed misclassified as haecceitistic.

Moreover, $(RC)_2$ implies that both the class of qualitative properties and the class of haecceitistic properties are closed under logical equivalence: if P and Q are logically equivalent properties (in the sense specified above), then P and Q are either both qualitative or both haecceitistic. For instance, given that *being self-identical* is classified as qualitative by $(RC)_3$, the property of *being either identical to David Lewis or not identical to David Lewis* will be classified as qualitative, too. Likewise, given that *being red* is classified as qualitative by $(RC)_3$, *being either red and identical to David Lewis or red and not identical to David* (i.e. *(red & identical to David Lewis) \vee (red & \neg identical to David Lewis)*) will be classified as qualitative, too. This result is generally considered counterintuitive (see, e.g., Rosenkrantz 1979).

The first problem can be avoided, however, if the implications of the intuitive understanding of the qualitative/haecceitistic distinction are fully taken into account. According to our intuitive understanding, a property is qualitative iff it does not involve any particular individuals. But this implies that the negation of a qualitative property does not involve any particular individuals either, that is, that the negation of a qualitative property is qualitative, too. In other words, the intuitive characterization of the qualitative/haecceitistic distinction implies that the class of qualitative properties is closed under negation.

The second problem is similar to one of the challenges that Rosenkrantz's account is designed to meet, that is, the problem that logically compound properties, such as *being identical to David Lewis or identical to Hilary Putnam*, do not imply the existence of a particular individual. The strategy which Rosenkrantz proposes to tackle this problem can also be used to meet the challenge that logically compound properties raise for $(RC)_2$. This leads to the following three-step criterion $(RC)_3$, which is my suggestion for a definition of the qualitative/haecceitistic distinction:

- (RC)₃ (a) A property P is basic qualitative iff it is not classified as haecceitistic by (RC)₂, that is, iff it is not the case that there is a two-place relation R such that:
- (i) There is a possible individual a , such that for all possible x , x 's having P is logically equivalent to x 's standing in R to a .
 - (ii) It is logically possible that there is an individual having the existential derivative of R but not P .
- (b) P is basic haecceitistic iff neither P nor $\neg P$ is basic qualitative.
- (c) P is haecceitistic iff P is either basic haecceitistic or can be recursively generated out of haecceitistic properties according to the rules of modal predicate logic.⁸

Condition (b) ensures that the class of qualitative properties is closed under negation and, hence, rules out the first problem that certain necessary qualitative properties, such as *being self-identical*, are classified as qualitative by (RC)₂, but their negations are misclassified as haecceitistic.

Condition (c) employs the same strategy as the one used by Rosenkrantz to deal with logically complex properties that do not imply the existence of some concrete individual. This solves the problem arising for (RC)₂ that a property is classed as qualitative whenever it is logically equivalent to some qualitative property. To see how (RC)₃ deals with such cases, note, first, that neither *being identical to David Lewis* nor *not being identical to David Lewis* are classified as basic qualitative according to condition (a). Therefore, condition (b) implies that *being identical to David Lewis* is basic haecceitistic. But then, condition (c) implies that the logically complex properties of *being either identical to David Lewis or not identical to David Lewis* and *being either red and identical to David Lewis or red and not identical to David* are correctly classified as haecceitistic.

Not being self-identical is not classified as basic haecceitistic according to condition (b) since its negation is classified as basic qualitative. Since it cannot be recursively generated out of basic haecceitistic properties either, it is, hence, correctly classified as qualitative.

To further illustrate how (RC)₃ works, consider finally a property involving relations to several individuals: *sitting between David Lewis and Hilary Putnam*. Define R as the relation obtaining between x and y iff x sits between y and Hilary Putnam. Note that R need not be qualitative; otherwise, (RC)₃ would be threatened with circularity. (i) is fulfilled, since x 's sitting between David Lewis and Hilary Putnam is logically equivalent to x 's standing in R to y . Since it is furthermore logically possible that there are individuals who instantiate the property of *sitting between someone and Hilary Putnam* without sitting between David Lewis and Hilary Putnam, (ii) is satisfied, too. Therefore, *sitting between David Lewis and*

⁸ More specifically, if P is a haecceitistic property and Q is some (qualitative or haecceitistic) property, then $\neg P$, $(P \ \& \ Q)$, $(P \ \vee \ Q)$, $(P \ \rightarrow \ Q)$, $(P \ \leftrightarrow \ Q)$, *being such that $\exists xPx$* , *being such that $\forall xPx$* , *being possibly P* and *being necessarily P* are haecceitistic properties. (This is, of course, analogous to Rosenkrantz's approach, see Rosenkrantz 1979, 522–523.)

Hilary Putnam is not classified as basic qualitative according to condition (a). Analogous reasoning shows that its negation is not classified as basic qualitative either. By conditions (b) and (c), this implies that the property is haecceitistic in virtue of being basic haecceitistic.⁹

6 A Possible Objection

As argued in the previous section, the relational criterion $(RC)_3$ can capture many crucial intuitions about the qualitative/haecceitistic distinction, including the intuition that the distinction is hyperintensional. However, to conclude my argument, one possible objection should be mentioned.

According to the argument given in the previous section, the notion of logical necessity (which is used to define logical equivalence) can be reduced to counterfactual considerations, that is, to invariance under all counterfactual perturbations. One might object to this approach on the grounds that it postpones the problem of defining logical necessity to the problem of providing a non-circular definition of counterfactual invariance. Moreover, this definition cannot rely on the standard Lewis/Stalnaker analysis of counterfactuals, since it presupposes that some counterfactuals with impossible antecedents are false, whereas according to the Lewis/Stalnaker analysis, all counterfactuals with impossible antecedents are vacuously true. For instance, if E is the qualitative essence of David Lewis and F is one of the conjuncts of E , the Lewis/Stalnaker analysis implies that the sentence ‘If David Lewis did not have F , then it would not be the case for all possible x that x has E iff x is identical to David Lewis’ is true, whereas my account presupposes that it is false.

Obviously, the general issue underlying this objection is the question how to deal with counterpossibles, that is, counterfactuals with metaphysically impossible antecedents. In order to render my definition adequate, I have to side with those philosophers who think that counterpossibles can vary in truth value (e.g. Nolan 1997; Bernstein 2016; for discussion see also Vetter 2016), hence, rejecting the standard Lewis/Stalnaker semantics for counterfactuals. However, rejecting the standard Lewis/Stalnaker semantics appears to be a natural step, once one has accepted that properties are to be individuated hyperintensionally. If it is taken for granted, for instance, that *being David Lewis* is not identical to E , then claiming that

⁹ A fundamental objection to all attempts to define the qualitative/haecceitistic distinction has been raised by Marshall, who provides a proof according to which the intrinsic/extrinsic distinction cannot be defined in terms of broadly logical notions and claims that it could be shown along analogous lines that the same holds for the qualitative/haecceitistic distinction (Marshall 2009, particularly 669). Whether or not Marshall’s argument applies to $(RC)_3$ depends on whether or not $(RC)_3$ is a definition in terms of broadly logical notions. According to Marshall, broadly logical notions are those notions that can be expressed using the following vocabulary: the logical vocabulary of first order predicate logic; the predicates ‘is a possible world’, ‘is a set’, ‘exists’, ‘=’, ‘ \in ’, ‘is a proper part of’, ‘instantiates’ and ‘is a property’; and the modal operators ‘possibly’, ‘necessarily’ and ‘at’ (Marshall 2009, 647).

However, the notion of invariance under all counterfactual perturbations used to define the concept of logical equivalence figuring in $(RC)_3$ is not a broadly logical notion in Marshall’s sense, nor can it be reduced to such notions. It follows that Marshall’s argument does not apply to $(RC)_3$.

counterpossibles starting with ‘If David Lewis had not instantiated E ,...’ have different truth conditions from counterpossibles starting with ‘If David Lewis had not been David Lewis,...’ seems to be a plausible consequence.

In general, any informative definition which avoids circularity and infinite regress has to take *some* notions for granted. The claim that we have to distinguish between logical and metaphysical necessity and that we can make sense of counterpossibles over and above simply stipulating that they are vacuously true are not mere ad hoc assumptions made only for the purpose of providing an adequate account of the qualitative/haecceitistic distinction. Rather, Lange-style definitions of logical necessity and non-Lewis-style accounts of counterpossibles are illuminating and interesting in their own right and can be used as a basis for a variety of metaphysically relevant definitions. One of these is the proposed definition of the qualitative/haecceitistic distinction. And this definition may in turn prove fruitful in current debates on laws of nature, supervenience, the thesis of haecceitism, and problems of identity and individuation.

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