HAECCEITISM, CHANCE, AND COUNTERFACTUALS

Boris Kment

Abstract. Anti-haecceitists believe that all facts about specific individuals—such as the fact that Fred exists, or that Katie is tall—globally supervene on purely qualitative facts. Haecceitists deny that. The issue is not only of interest in itself, but receives additional importance from its intimate connection to the question of whether all fundamental facts are qualitative or whether they include facts about which specific individuals there are and how qualitative properties and relations are distributed over them. Those who think that all fundamental facts are qualitative are arguably committed to anti-haecceitism. The goal of this paper is to point out some problems for anti-haecceitism (and therefore for the thesis that all fundamental facts are qualitative). The article focuses on two common assumptions about possible worlds: (i) Sets of possible worlds are the bearers of objective physical chance. (ii) Counterfactual conditionals can be defined by appeal to a relation of closeness between possible worlds. The essay tries to show that absurd consequences ensue if either of these assumptions is combined with anti-haecceitism. Then it considers a natural response by the anti-haecceitist, which is to deny that worlds play the role described in (i) and (ii). Instead, the reply continues, we can introduce a new set of entities that are defined in terms of worlds and that behave the way worlds do on the haecceitist position. That allows the anti-haecceitist to formulate anti-haecceitist friendly versions of (i) and (ii) by replacing the appeal to possible worlds with reference to the newly introduced entities. This maneuver invites an obvious reply, however. If the new entities are the things that play the role we typically associate with worlds, as partially described by (i) and (ii), then it is natural to conclude that they really are the entities we talk about when we speak of worlds, so that haecceitism is true after all.

Imagine a symmetrical world *w* where nothing exists except two qualitatively indistinguishable motionless fundamental particles, *A* and *B*, in otherwise empty space-time.[1, 2] Both particles have always existed and will always continue to exist. Nothing in this world ever changes. Let *t* be any point of time. It's surely true that

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(1) It is (metaphysically) possible that *A* disappears at *t*, while *B* continues to exist forever.

Hence, there is a possible world w_1 that meets the following description.[3]

> w_1: Before *t*, everything happens exactly the way it does in *w*. Then at *t*, *A* disappears, while *B* continues to exist forever.

The following claim is surely true as well:

(2) It is (metaphysically) possible that *B* disappears at *t*, while *A* continues to exist forever.

So, there's surely a possible world w_2 meeting the following description.

> w_2: Before *t*, everything happens exactly the way it does in *w*. Then at *t*, *B* disappears while *A* continues to exist forever.

Most philosophers would agree with judgments (1) and (2), and would therefore agree that there is both a possible world that meets our description of w_1 and a possible world that meets our description of w_2. What is much more controversial, however, is whether the two descriptions single out *different* worlds, or whether they are merely different descriptions of the same world. Note that w_1 and w_2 are qualitatively indistinguishable

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[1] The example is a variant of an example due to Robert Adams (1979), and is reminiscent of the well-known case of the two spheres that Black gives in his (1952). However, Black's concern was not with the modal thesis of anti-haecceitism, but with the thesis of the identity of indiscernibles.

[2] By saying that the two particles are qualitatively indistinguishable I mean that they share all purely qualitative properties, where a purely qualitative property is, roughly speaking, one whose instantiation by a certain individual is in no way a matter of which individual it is or which individuals it is related to. (This sense of 'qualitative' is different from the sense of the same word that contrasts with 'quantitative.') Note that it's compatible with the qualitative indistinguishability of the two particles that they have different locations, provided that the two locations themselves are qualitatively indistinguishable.

[3] More precisely: *at w*, there's a possible world w_1 that meets this description. Some philosophers, typically actualists, believe that possible worlds can be contingent existents. On such a view, w_1 may not *actually* exist.

(that is, the same qualitative facts obtain at both of them). w_2 is just w_1 turned around by 180 degrees, as it were. If there's a difference between them, then it can only concern the question of which particle it is that disappears and which particle it is that remains; the particle that disappears in w_1 is the one that continues to exist in w_2, and vice versa. And philosophical opinion is divided on the question whether two worlds can differ *only* in how qualitative roles are distributed over individuals, without differing qualitatively.

If you think that the answer to this question is affirmative, then you are a 'haecceitist' in the sense in which I will be using the term.[4] Haecceitists believe that there is more to a possible world than its qualitative character. There is, in addition, the question of which individual plays which qualitative role, and the qualitative nature of a possible world need not determine the answer to this question. By contrast, if you think that possible worlds can*not* differ in what's true at them about specific individuals without differing qualitatively, then you are an 'anti-haecceitist.' Anti-haecceitists believe that what is true of a certain individual at a specific world is completely determined by the world's qualitative character and the features of the relevant individual.[5]

How is that supposed to work? The standard anti-haecceitist answer appeals to the notion of a counterpart. An individual *a* is *P* at world *v* (or: *v* represents *a* as being *P*[6, 7]—

[4] The term, of course, is due to Kaplan (1975, 722f.). For a very useful explanation of haecceitism, see Lewis (1986b, ch. 4).

[5] Anti-haecceitism says that two worlds *v* and *v** that are qualitatively alike don't differ in what's true at them concerning specific individuals. As Lewis has pointed out, that doesn't entail that *v* and *v** are identical (1986b, 224). It's consistent with anti-haecceitism that there are qualitatively indistinguishable worlds that are not identical, though anti-haecceitism entails that such worlds cannot differ at all in what's true at them. Anti-haecceitists who allow for this possibility might say that there could be more than one world that meets our description of w_1, and more than one world meeting our description of w_2. But they would still say that any world satisfying the first description also fits the second, and vice versa. The two descriptions don't single out different worlds. That's where the anti-haecceitist and the haecceitist disagree.

For the sake of simplifying the discussion, I will often write as if the anti-haecceitist was committed to the identity of qualitatively indiscernible worlds. But nothing will hang on it. The discussion could easily be reformulated so as to use only the weaker assumption that the anti-haecceitist is committed to the thesis that qualitatively indiscernible worlds are completely indiscernible in what's true at them.

[6] … or, as Lewis expresses it in his (1973): individual *a* 'vicariously satisfies' the open sentence '*x* is *P*' at world *v*.

[7] I am here using 'represent' in a technical sense. To say in this sense that *w* represents that *P* is simply to say that the claim that *P* is *true at w* in a technical sense of 'true at' that is specific to the theory of modality. (And if *P* is a claim about specific individuals, then by counterpart-theoretic lights, the claim that *w* represents that *P* is merely convenient shorthand for a certain counterpart-theoretic claim.) I think that this sense of 'represent' may not be the same as the sense in which we talk about, for instance, mental or linguistic representation. The term 'true at (a world)' is in a similar position to 'represent.' I don't claim that it is related in any simple and straightforward way to any ordinary, pre-theoretical notion of truth.

I will use the two phrases interchangeably) just in case *v* contains an individual that is a 'counterpart' of *a*, that is to say, which stands to *a* in the right kind of similarity relation, and that is *P*.[8] Example: You are a philosopher, but you could have been a professional tennis player. That is to say that some possible world represents you as a tennis player. For the counterpart theorist, that is to say that some possible world contains a counterpart of you—someone standing in the right similarity relation to you—who plays tennis for a living.[9]

The anti-haecceitist can agree, then, that we can describe other possible worlds by referring to specific individuals, as when we say that you are a tennis player at this or that world. But that's just a complex and sophisticated method of describing what purely *qualitative* facts obtain at that world. We are describing these facts by comparing the qualitative features of the other world's denizens to those of the inhabitants of *our* world. We are, as it were, using the individuals of our world as a reference frame for describing the qualitative character of the other world. (Sometimes there are two equally good ways of doing this. The anti-haecceitist would say that that's what happens in the example of the two particles. The very same world meets our description of w_1 and our description of w_2. For the particle that disappears at that world is a counterpart of both *A* and *B*, and the same is true of the particle that remains. That's why the world can be described as one where *A* disappears while *B* remains, or as one where *B* disappears while *A* remains.)

Is it possible to be an anti-haecceitist without endorsing counterpart theory? Not, as far as I can see, without significant cost. Surely, anti-haecceitists want to be able to say that (1) and (2) are both true in our example, and hence that there are possible worlds that meet our descriptions of w_1 and w_2. At the same time, they need to say that the two

[8] Some counterpart theorists may prefer not to state the fact that *a* has a counterpart in *w* that is *P* by saying that *a* is *P* at *w*, or that '*a* is *P*' is *true at w*, since on this account the concept of truth at a world may not behave in quite the way it is often thought to behave. (For example, we are used to saying that a sentence *S* is necessary just in case *S* is true at all possible worlds. When combined with the present conception of truth at a world, that entails that '*a* is *P*' is necessary just in case every world contains a counterpart of *a* that is *P*. Counterpart theorists may not accept that, but may prefer to say, e.g., that the sentence is necessary just in case all counterparts of *a* are *P*.) It seems to me, however, that there is no harm in using 'true at' in the way described, provided we are careful not to assume that the concept it expresses plays exactly the role most commonly ascribed to it.

[9] For expositions of Lewis's counterpart theory, see Lewis (1968, 1971, 1973, 1986b). For other versions of counterpart theory, see Forbes (1982, 1987, 1990), Ramachandran (1989, 1990a, 1990b). For a classic discussion, see Hazen (1979). For some more recent discussion, see Dorr (2005, n.d.); Fara & Williamson (2005); Fara (2008, 2009).

descriptions single out the same world, so they need an account of *de re* modal talk according to which one and the same world can be correctly described in either way: by saying that particle *A* disappears while particle *B* doesn't, and by saying that *B* disappears while *A* doesn't. And to my knowledge, counterpart theory is the only account ever developed that allows us to describe one and the same world in both of these ways without contradiction. I will assume in what follows that all parties to the debate agree that we should accommodate the intuition that underlies our judgment that (1) and (2) are true in the example, and will therefore restrict my attention to those versions of anti-haecceitism that endorse counterpart theory.

I will not assume, however, that every counterpart theorist has to be an anti-haecceitist. Some philosophers have proposed, or at least discussed, non-qualitative counterpart theory, that is, theories according to which the extension of the counterpart relation is not completely determined by purely qualitative similarities between individuals. Variants of such a view are described, for example, in Lewis (1986b, scts. 4.4 – 4.5), Fara (2008) and Dorr (n.d.). Such views are usually haecceitist. They fall outside the scope of my paper, since my target is anti-haecceitism (and the concomitant theory of qualitative counterparts), not counterpart theory as such. I do not claim that my arguments apply to non-qualitative counterpart theory.

The dispute between haecceitists and anti-haecceitists is not only of interest in itself. I think that it derives additional importance from its intimate connection to a number of further issues in metaphysics, one of which I will discuss in section 1. Previous discussions of haecceitism have most often focused on one or another of a restricted range of issues. Some authors, for example, attempted to evaluate the two opposing positions in light of pre-philosophical intuitions about the identity or distinctness of possibilities.[10] Although I cannot argue the point here, I suspect that such considerations yield at best a draw. Other discussions have centered on the difficulties that counterpart theorists face when trying to give an account of how the actuality operator works. The problem was pointed out by Allen Hazen (1979), and a complex debate ensued, with several revisions of counterpart theory being proposed and new variants of the problem

[10] For discussions of these intuitions, see, for example, Adams (1979), Lewis (1986b, ch. 4).

formulated that affect these new versions (Forbes (1982, 1985, 1987, 1990), Ramachandran (1989, 1990a, 1990b), Fara & Williamson (2005), Fara (2008); also see Dorr (n.d.)). The dialectic here may be ongoing. I will not, however, jump into the fray to determine who will ultimately win this debate. For I think that there are other formidable difficulties confronting the anti-haecceitist. After some stage-setting in section 2, I will center on two problems that have not received a lot of attention so far, one in the theory of chance (section 3), and one in the theory of counterfactual conditionals (section 4). Section 5 explores some strategies that an anti-haecceitist could employ to respond to these problems, and argues that they are likely to confront significant challenges.

1. A reason to care about the haecceitism dispute: the question whether reality is at bottom purely qualitative

I take it to be an important task of the metaphysician to find out what reality looks like at the most fundamental level. Among other things, we want to find out how rich an ideology and ontology we need in order to give a complete description of the fundamental facts about the world. There is no lack of strong opinions about this topic. Consider physicalism. On one interpretation, this is the thesis that all fundamental facts are physical facts. All other facts are grounded in the physical facts. The debate about haecceitism is intimately connected to another thesis with a similar structure: the thesis that all fundamental facts are qualitative; that is, that they are facts about the pattern of instantiation of properties and relations that are purely qualitative (in the sense that their instantiation by certain individuals is in no way a matter of which specific individuals these are or which specific individuals they are related to). I will call this thesis 'anti-individualism.' The opposing view, individualism, holds that the fundamental facts include in addition what I will call 'individualist' facts: facts about which specific individuals there are, and how the qualitative properties and relations are distributed over specific individuals.[11]

To get the contrast between the two positions into clearer focus, let's suppose that we had at our disposal a language all expressions of which are purely qualitative. It has no

[11] I am borrowing the term 'individualism' from Dasgupta (2009).

names for individuals, and no other expressions (like 'pegasizes,' 'Socrateity,' 'Marxist' or 'French') that make overt or covert reference to specific individuals. All of its predicates and relation symbols express properties and relations that are qualitative. But the resources of the language are otherwise unlimited. It can describe every qualitative fact. The anti-individualist believes that such a language would suffice to give a complete description of all of fundamental reality. The individualist denies that.

Anti-individualists reject fundamental individualist facts. But they are free to accept that individuals exist. They may even include individuals in their fundamental ontology; that is to say, they may hold that, in stating the fundamental facts, we need to quantify over individuals. Some of the sentences stating fundamental facts might, for example, be of the form '$(\exists x)(Px)$' or '$(\exists x)(\exists y)(Rxy)$.' These sentences are, after all, cast in a purely qualitative language. The anti-individualist just needs to hold that when stating the fundamental facts, we cannot add, after saying that there is an individual with such-and-such qualitative features: and that individual is *a*. Such a view would allow individuals into our fundamental ontology, and yet be anti-individualist in my sense. The view could perhaps be stated by saying that, even fundamentally speaking, there are indeed individuals, but there are no fundamental facts about which individual any one of them is. Individuals are, as it were, mere anonymous loci of instantiation of qualitative properties and relations, nameless pegs on which we can hang these properties and which we can connect by these relations. They are individuals without individuality.[12, 13]

[12] Some philosophers (for example Rosen, (2010) and personal communication; for an interesting discussion, see also Fine (n.d., §7)) are attracted to the principle that all existential facts must be grounded in their instances. For example, if it is a fact that something is *F*, then that fact must be grounded in some specific instance of this existential generalization, that is, in some fact of the form *a is F*. As Gideon Rosen pointed out to me, anti-individualists who include individuals in their fundamental ontology need to give up this principle. For these philosophers believe that there are fundamental facts of the form 'there is an *x* that is *P*'. Since fundamental facts aren't grounded in other facts, it follows that these existence facts aren't grounded in their instances. I happen to believe that there are independent reasons for abandoning the principle that all existential facts are grounded in their instances (though I cannot argue the point here), so I don't count this as a serious cost of anti-individualism with fundamental individuals.

[13] It's worth noting that anti-individualists who accept individuals into their fundamental ontology will most likely deny that the operator 'it's a fundamental fact that' commutes with the existential quantifier. For they accept that there are truths of the form *it's a fundamental fact that there is an individual x such that Fx*, but will probably deny that that entails *there is an individual x such that it's a fundamental fact that Fx* (for the latter claim appears to entail that there are fundamental individualist facts). (Thanks to an anonymous referee for *Philosophical Review* for pointing this out.)

Just as anti-individualism doesn't commit you to excluding individuals from your fundamental ontology, it doesn't commit you to the identity of qualitatively indiscernibles. The anti-individualist could hold that a complete description of fundamental reality includes the claim that

(3) $(\exists x)(\exists y)(\Phi(x) \,\&\, \Phi(y) \,\&\, x \neq y)$,

where 'Φ' incorporates a complete description of the qualitative features (including relational ones) of the two individuals. (3) is, after all, cast in purely qualitative terms, so that the claim that it states a fundamental fact doesn't violate the principle that all fundamental facts are qualitative. In other words, the anti-individualist can allow that two individuals are qualitatively indistinguishable, but distinct.

A thesis (like physicalism or anti-individualism) that is of the form 'all facts are grounded in the A-facts' or 'all fundamental facts are A-facts' is connected in interesting ways to a corresponding supervenience thesis. Consider physicalism again. That thesis is widely thought to be tied in important ways to a thesis of global supervenience, though it's controversial what the relevant supervenience thesis is. The simplest global supervenience thesis in this area is the claim that

(4) All facts globally supervene on the physical facts,

that is, that there are no two possible worlds that are alike in all physical facts, but differ in other ways. It is widely assumed, though, that the physicalist is not committed to a thesis that strong. Most physicalists, after all, take physicalism to be a contingent truth. They needn't deny that there are possible worlds containing immaterial spirits, for example. (They just deny that the actual world is like that.) And they can allow that there are two immaterial-spirit worlds that are physically alike but differ in spiritual facts, which would be a counterexample to (4). The supervenience thesis connected to physicalism must therefore be weaker than (4), and there are different ways in which physicalists can weaken (4).[14] Following Lewis's statement of materialism (1983), for example, they may restrict the supervenience thesis to worlds that contain no instances of

[14] For some well-known strategies for weakening (4), see Lewis (1983), Jackson (1998, 12), Chalmers (1996).

natural properties that are "alien to the actual world," that is, natural properties that aren't instantiated in the actual world, and that aren't conjunctions of, or structural properties constructed from, natural properties instantiated in the actual world.[15] (The immaterial-spirit worlds then no longer present a problem, since by physicalist lights they contain instances of alien natural properties.)

Now, it is a good question how physicalism relates to the suitably qualified thesis of global supervenience. Some philosophers have assumed that physicalism *is* that supervenience thesis. Other philosophers have argued that the most interesting thesis of physicalism is much stronger than the supervenience thesis.[16] In any case, though, it seems very plausible, and it is widely assumed, that physicalism *entails* the supervenience thesis.

What we said about physicalism also holds, *mutatis mutandis*, for anti-individualism. We should expect that this view commits its proponent to a supervenience thesis (even if it's not *identical with* any supervenience thesis). The simplest supervenience thesis in the area is the claim that all facts globally supervene on the purely qualitative facts, that is, that there are no two possible worlds that are qualitatively indistinguishable but differ in other ways, namely in what's true at them concerning specific individuals. And that, of course, is just anti-haecceitism.

Are anti-individualists committed to the unqualified thesis of anti-haecceitism? That depends at least in part on whether they take anti-individualism to be a necessary truth. If they do, that is, if they think that it's true *in all possible worlds* that all fundamental facts are purely qualitative, then they are likely to accept the unrestricted version of the anti-haecceitist supervenience thesis. But they may instead take the truth of anti-individualism to be contingent (for example, if their anti-individualism is motivated by empirical results about the chance distribution over possible outcomes of quantum coin tosses, or by the apparent undetectability of individualist facts[17]). Then they may want to add a restriction to the supervenience thesis, just as proponents of contingent physicalism qualify their thesis of the global supervenience on the physical. Roughly speaking, if *w* and *w** are two

[15] Lewis (1983).
[16] See Horgan (1993) for discussion. For relevant discussion, also see Kim (1993, 1998, 2005).
[17] See, for example, Teller (2001), Dasgupta (2009).

possible worlds where fundamental reality isn't richer than in the actual world as far as individuality is concerned, *w* and *w** don't differ without differing qualitatively. That's not very precise of course, but for our purposes it won't be important to give a more exact formulation, since (for reasons to be considered presently) the details don't matter much for my purposes.

Anti-individualism paints a more parsimonious picture of what reality is like at the most fundamental level than individualism does. So, there is a possible Occamist motivation for being an anti-individualist, and hence for endorsing anti-haecceitism, or at least the restricted version of anti-haecceitism that is entailed by the most plausible version of anti-individualism. Conversely, if it is possible to show that anti-haecceitism, or a suitably restricted version of it, is untenable, then that would vindicate individualism. In sections 3 and 4 I will consider arguments aimed to show that we are in theoretical trouble unless we accept the existence of pairs of worlds that are qualitatively indistinguishable but differ in what's true at them concerning specific individuals. I believe that there is absolutely no reason for thinking that, when it comes to the structure of individuality, fundamental reality is somehow richer in the worlds that figure in my examples than in the actual world. I therefore suspect that, if the arguments in sections 3 and 4 carry the day, then the examples figuring in these arguments are counterexamples even to a suitably restricted version of anti-haecceitism (no matter what the details of the restriction are), and therefore present a problem for the anti-individualist.

That claim needs to be qualified in one way, however. I mentioned that anti-individualism as such doesn't commit you to excluding individuals from your fundamental ontology, or to endorsing the identity of qualitatively indiscernibles. But some versions of anti-individualism embrace these commitments anyway. An example is the bundle theory of individuals, which holds that, fundamentally speaking, all that exists are qualitative properties. Individuals are bundles of these. This view rejects fundamental individuals and arguably precludes the possibility of distinct but qualitatively indistinguishable individuals. Another example is the sophisticated view recently proposed by Shamik Dasgupta,[18] which also excludes individuals from fundamental

[18] Dasgupta (2009).

ontology, at least as far as the material world is concerned (though it doesn't endorse the identity of qualitatively indiscernibles). The arguments in sections 3 and 4 won't apply to versions of anti-individualism that endorse the identity of qualitatively indiscernibles, and it is open to question whether they, or suitable variants of them, apply to views that deny that the fundamental entities include individuals (a question that I will have no space to consider in this paper). It also seems to me, however, that views of these two kinds depart more strongly from pre-philosophical opinion than we need to in order to be anti-individualists. More conservative forms of anti-individualism are directly in my firing line.

With the distinction between individualism and anti-individualism clearly in mind, the reader may be tempted to raise an objection. In the introduction, I described the two-particle world by saying things like: it's true at this world that *A* could have decayed. And I said that I expected widespread agreement that there is a world that meets that description. But the claim that it's possible that *A* decays may sound like it's stating an individualist fact (the sentence may seem to say that there's a particle that could have decayed and also to tell us which particle that is, namely *A*). Consequently, some readers may suspect that those who take anti-individualism to be a necessary truth shouldn't accept that there is a world that meets my description since, fundamentally speaking at least, no possible world contains individualist facts.

In response, I say: think of the letters '*A*' and '*B*' in my description of *w*, not as proper names for the two particles, but as variables bound by an existential quantifier at the beginning of my description. In other words, my description should be interpreted thus:

(5) There is a particle *A* and a particle *B* that have such-and-such qualitative properties and stand in such-and-such qualitative relations, such that it's possible for *A* to decay while *B* doesn't, and it's also possible for *B* to decay while *A* doesn't.

With '*A*' and '*B*' understood in this way, (5) is cast in purely qualitative terms, and even those who take anti-individualism to be a necessary truth should accept that there are possible worlds where (5) is true.[19]

It's important to take this point fully on board since the examples considered in the rest of this essay will be very similar to the two-particle case. In each case, I will describe a possible world involving various individuals, assign labels to these individuals ('*A*' and '*B*', 'Fred' and 'Twin-Fred'), and then use these labels to say that such-and-such is true of these individuals at that world (for example, that it's true at the world that such-and-such would have happened to these individuals if this or that had been the case, or that the chance is *p* that such-and-such will happen to them). In each case, that should be understood as the claim that a certain existentially quantified claim is true at the world, with the labels being variables that are bound by the quantifiers at the beginning of that quantified claim.

2. Preliminaries

Before we can start to discuss the difficulties for anti-haecceitism, some preliminaries are needed. Whether an individual *x* is a counterpart of individual *y* depends whether *x* and *y* stand in the right similarity relation to each other. There are different ways of making this idea more precise. David Lewis, for example, offers the following definition: *a** in world *v* is a counterpart of *a* just in case *a** has a certain minimum degree of overall similarity to *a* in its purely qualitative properties, and nothing in *v* is more qualitatively similar overall to *a* than *a**.[20] Another natural definition, broader and simpler, omits the second clause: *a** is a counterpart of *a* just in case *a** is sufficiently qualitatively similar overall to *a*.

[19] To give an account of what makes (5) true at these worlds, the necessitarian anti-individualist needs to appeal to counterpart theory. (5) is true at *w* because it's true at *w* that

> There's a particle *A* and a particle *B* that have such-and-such qualitative properties and stand in such-and-such qualitative relations, such that there's a possible world w_1 that contains a counterpart of *A* that decays and a counterpart of *B* that doesn't decay, and there's also a possible world w_2 that contains a counterpart of *B* that decays and a counterpart of *A* that doesn't decay.

[20] Lewis (1973, 39).

I said that counterparthood is a relation between individuals that may inhabit different possible worlds. But how literally we can take talk about individuals in other worlds depends on our theory of worlds. On Lewis's realist account, worlds are, to simplify a little, spatio-temporally extended objects, many of them filled with material things like you.[21] On this conception, talk of a world's constituent individuals can be taken in the most literal sense. But most philosophers would reject this realist picture, in favor of thinking of worlds as abstract entities. Then talk of constituents of a world may need to be construed differently. For the purposes of illustration, consider what Lewis has called 'linguistic ersatzists,' that is, philosophers who regard worlds as sentences or sets of sentences of a special universal language.[22] Linguistic ersatzists who want to be an anti-haecceitists could build worlds using the resources of a language that contains no singular constants and whose predicates are purely qualitative. To fix ideas, let us assume that they think of a world as a long Ramsey sentence, a sentence that starts with a long string of existential quantifiers, followed by an open sentence containing all the variables bound by these quantifiers and no other singular terms. The sentence must be constructed so as to give us a complete qualitative description of reality. One world, the 'actual' one, is a wholly true description of reality, all other worlds depart to various degrees from the truth. Each world is associated with many qualitative roles of individuals, one for each of the variables bound by the initial quantifiers of the Ramsey sentence. All talk about the constituents of a world can be spelled out as talk about these qualitative roles. We can take the 'constituent individuals' of a world *u* to be pairs <*u*; *v*>, where *v* is one of the individual variables occurring in the Ramsey sentence *u*. (Adapting a common term, we can call these pairs 'centered worlds.') We can define a counterpart relation between these centered worlds. If we accept the definition of counterparthood that Lewis gave in his (1973), we can say that <*u*; *v*> is a counterpart of <*u**; *v**> just in case the qualitative role given by <*u*; *v*> is sufficiently similar to the one given by <*u**; *v**> and at least as similar to the latter as the qualitative role of any other individual in *u*. (By omitting the second clause, we obtain a new version of the simpler alternative definition of the counterpart relation.) By extension, we can also speak of the constituent individuals of

[21] Lewis (1986b, ch. 1).
[22] See Lewis (1986b, sct. 3.2).

worlds (that is, of centered worlds) as being counterparts of concrete individuals like you and me. <*u*; *v*> is a counterpart of you just in case the qualitative role given by <*u*; *v*> stands in the right similarity relation to your own qualitative role. World *u* represents you as having property *P* just in case there is a constituent individual <*u*; *v*> of *u* that is your counterpart, and being *P* is part of the qualitative role given by <*u*; *v*>.

3. The role of possibilities in the theory of chance[23]

One part of the theoretical role of possibilities concerns the theory of objective physical chance. At any given time, different possible future histories of the universe have different chances. We can think of the chance distribution at time *t* as a probability measure on the set of metaphysically possible worlds. Let us call the set of possible worlds that are like the actual world up to time *t* and follow the actual laws thereafter 'the set of possibilities open at *t*,' or 'OP_t,' for short. (The set of worlds not in OP_t has probability measure zero.) Under determinism, OP_t contains exactly one world, which has a chance of 1 of being actualized. Under indeterminism, chances may be spread out more widely over worlds.

Instead of applying predicates of the form 'has an X% chance at time *t*' to (sets of) possible worlds, our discourse about chance often makes use of a family of sentence operators of the form 'there's a chance of X% at time *t* that *P*.' (I will sometimes abbreviate this as '$\mathrm{ch}_t(P) = \mathrm{X}\%$.') The two locutions are connected by the simple principle that

(6) The chance that *P* is *x* just in case the chance measure of the set of possible worlds where it's true that *P* is defined and equals *x*.

(The relativization to a time has been left implicit for the sake of simplicity.) For example, the chance that it will rain in New York City tomorrow equals the chance measure of the set of those worlds where it's true that it will rain in New York City tomorrow.

[23] For an influential discussion of counterpart theory and some of its implications for the theory of probability, see Kripke (1980, 16ff.).

We often use sentences of the form 'the chance that *a* is *F* equals *x*.' (6) tells us that such a sentence is true iff the chance measure of the set of worlds where it's true that *a* is *F* equals *x*. By anti-haecceitist lights, these are the worlds where some counterpart of *a* is *F*. In general, it seems that the anti-haecceitist has to say that

(7) The chance that $\Phi(a)$ equals the chance measure of the set of possible worlds that contain a counterpart of *a* that satisfies '$\Phi(x)$.'[24]

This view, however, has numerous problematic consequences. We can bring them into clear focus by considering the example of a possible world *w* that meets the following description:

(8) The universe is indeterministic, and up to *t* it consists of two indistinguishable halves, Lefty and Righty, arranged in such a way that (up to *t*) the universe is perfectly symmetrical. (By coincidence, all random processes up to *t* have the same outcomes in the two halves.) There is a type of particle, called the 'X boson.' The laws allow for the possibility that an X boson decays and disappears, but not for the possibility that a new X boson is created (the number of X bosons can diminish over time, but never increase). There are exactly two X bosons at *t*, *A* in Lefty and its twin *B* in Righty. At *t*, each of them has a 50% chance of decaying within a year. *A*'s decay is probabilistically independent of *B*'s decay.

Consider the following claims.

A: Particle *A* decays within a year after *t*.

B: Particle *B* decays within a year after *t*.

[24] What was said at the end of section 1 applies here, too. Those who take anti-individualism to be a necessary truth deny that there's a possible world where it's a fundamental individualist fact that the chance that $\Phi(a)$ equals *p* (for some specific individual *a*). Such philosophers should agree, however, that there is a possible world *w* that meets the following description.

(24) There is some individual *a* that has such-and-such qualitative features, such that $ch_t(\Phi(a)) = p$.

(Note that (24) is a purely qualitative claim.) And they can understand (7) as the thesis that what makes a claim of the form (24) true at a world is the fact that at that world,

> There is some individual *a* that has such-and-such qualitative features, such that that the chance measure of the set of possible worlds that contain a counterpart of *a* that satisfies '$\Phi(x)$' equals *p*.

My argument applies to this position. To see this, the reader just needs to understand the letters '*A*' and '*B*' in my description of *w* in (8) below as variables bound by an existential quantifier, rather than as names for the two *X*-bosons.

S_0 / S_1 / S_2: Exactly zero/one/two X-bosons decay within a year after *t*.

(I will use 'A', 'B', 'S_0', etc. both as abbreviations and as names for these claims, a harmless ambiguity. Note that 'A' and 'B' are not italicized, to distinguish them from the italicized letters I am using for the two bosons.)

Let OP_t be the set of possible worlds that are like *w* up to *t* and follow the laws of *w* thereafter. (Since each world in OP_t is like *w* up to *t*, each such world contains two X bosons at *t*. And since each world in OP_t follows the laws of *w* and these laws rule out the generation of new X bosons, no world in OP_t contains more than these two X bosons at any time after *t*.) Given the perfect symmetry of *w* up to *t*, and assuming that the laws of *w* are purely qualitative (they don't mention specific individuals by name), we can conclude that any way that Lefty can evolve consistently with the laws and the history up to *t* is also a way that Righty can evolve, and vice versa. So, for any world w_1 in OP_t, there is another world w_2, such that

(9) w_2 represents Lefty as evolving in just the way w_1 represents Righty as evolving, and w_2 represents Righty as evolving in just the way w_1 represents Lefty as evolving.

Where w_1 and w_2 are any two worlds in OP_t that stand to each other in the relation described in (9),

(10) w_2 represents *B* as evolving in exactly the way w_1 represents *A* as evolving, and w_2 represents *A* as evolving in exactly the way w_1 represents *B* as evolving.

Moreover, it follows from (9) that w_1 and w_2 are qualitatively indistinguishable. By anti-haecceitist lights, therefore, w_1 and w_2 cannot differ in what they represent concerning any individual. In particular,

(11) w_1 represents *A* as evolving in exactly the way w_2 represents *A* as evolving, and w_1 represents *B* as evolving in exactly the way w_2 represents *B* as evolving.

(10) and (11) together entail that w_1 represents *A* as evolving in exactly the way that w_1 represents *B* as evolving. So, every counterpart of *A* in w_1 is also a counterpart of *B*, and vice versa. That is to say, each of the two X bosons in w_1 is a counterpart of both *A* and *B*.

Our argument therefore shows that any X boson in any world in OP_t is a counterpart of both *A* and *B*. That conclusion, as I will argue next, forces some very unwelcome consequences on the anti-haecceitist.

(8) stipulates that

(12) $ch_t(A) = ch_t(B) = ch_t(B/A) = 50\%$.

What, then, are the chances of S_0, S_1, and S_2? The answer may seem obvious:

(13) $ch_t(S_0) = ch_t(S_2) = 25\%$
$ch_t(S_1) = 50\%$

But the anti-haecceitist cannot say this. According to (7), $ch_t(A)$ equals the chance measure of the set of worlds where a counterpart of *A* decays. And given that every X boson in any world in OP_t is a counterpart of *A*, that is just the set of all worlds in OP_t where at least one X boson decays (the set of worlds where either S_1 or S_2 is true). But if (13) were true, the chance measure of that set would be 75%. So, by anti-haecceitist lights, (13) entails that *A*'s chance of decay is 75%, contrary to our initial stipulation (as stated in (12)). The anti-haecceitist therefore cannot accept what seems to be obvious, namely that if (12) is true at *w*, then (13) is true at *w* as well.

That's only the beginning of the anti-haecceitists' troubles. They are also forced to deny that the following compelling principles hold for physical chance:

(14) $P(\sim A) = 1 - P(A)$.

(15) $P(A \text{ or } B) = P(A) + P(B)$, where A and B are mutually logically inconsistent.

The example of the two bosons illustrates this. Suppose that $ch_t(S_1) > 0$. Now, since every boson in every world in OP_t is a counterpart of both *A* and *B*, we can conclude from (7) that $ch_t(A) = ch_t(S_1) + ch_t(S_2)$, and that $ch_t(\sim A) = ch_t(S_0) + ch_t(S_1)$. So, $ch_t(A) + ch_t(\sim A) = ch_t(S_0) + 2 \times ch_t(S_1) + ch_t(S_2)$. Since $ch_t(S_1) > 0$ and $ch_t(S_0) + ch_t(S_1) + ch_t(S_2) = 1$, it follows that $ch_t(A) + ch_t(\sim A) > 1$, contrary to (14). Principle (15) fails as well. For according to (7), $ch_t(A \text{ or } \sim A)$ is equal to one (since the set of worlds in OP_t where *A* has a counterpart that either decays or fails to decay is OP_t itself, and its chance measure is therefore 1). So, $ch_t(A \text{ or } \sim A) = 1 < ch_t(A) + ch_t(\sim A)$, contrary to (15).

It might seem very surprising at first blush that (14) and (15) fail for chances on the anti-haecceitist picture. We are used to thinking that both principles follow from the axioms of the probability calculus that are often taken to define the concept of a probability measure. The anti-haecceitist, however, ought to deny that (14) and (15) follow from the probability axioms. The usual set-theoretic presentation of the probability calculus appeals to a set of 'outcomes,' Ω, and a σ-algebra *F* over Ω, that is, a set of subsets of Ω that includes Ω and is closed under complementation and countable union and intersection. When we are concerned with objective physical chance, Ω is most naturally taken to be the set of all maximally specific possible situations, or possible worlds. (Of course, when we are considering some other notion of probability, for example rational credence, we might prefer to interpret Ω differently, for instance as the set of centered worlds. I will focus exclusively on chance, however.) The members of *F* can be interpreted as possible (maximal or non-maximal) situations. Each member of *F* is a possible situation that obtains in all and only those possible worlds that are its members. (For example, one member *X* of *F* might be the set of all and only those possible worlds where it will rain tomorrow. Then *X* is the situation of its raining tomorrow.) Suppose that we use '*P*( ) = *x*', with italicized '*P*', for the predicate 'has chance *x*', which is applicable to members of *F*, while reserving 'P( ) = *x*', with non-italicized 'P', for the sentential operator 'the probability is *x* that ___.' Then we can state Kolmogorov's axioms as follows:

(16) (i) $P(X) \geq 0$ for all X in F.

(ii) $P(\Omega) = 1$.

(iii) For any countable sequence $X_1, X_2, \ldots$ of pairwise disjoint members of F, $P(X_1 \cup X_2 \cup \ldots) = P(X_1) + P(X_2) + \ldots$.

Principle (6) connects claims using chance predicates applied to sets of worlds to claims containing the sentential chance operators. If we want to derive (14) and (15) from (6) and the axioms (16), we need the following principle:

(17) If '*P*' and '*Q*' are mutually logically inconsistent, then there is no possible world where it is true that *P* and where it is also true that *Q*.

The anti-haecceitist counterpart theorist, however, needs to reject (17). Remember that for the anti-haecceitist, it's true at world *w* that $\Phi(i)$ just in case *w* contains a counterpart of *i* that satisfies '$\Phi(x)$.' Now, when a world *w* contains more than one counterpart of *i*, then one of them may satisfy '$\Phi(x)$,' while another satisfies '$\sim\Phi(x)$.' Then it's true at *w* that $\Phi(i)$ and it's also true at *w* that $\sim\Phi(i)$. (But it's not true at *w* that $\Phi(i) \,\&\, \sim\Phi(i)$. *That* would be true at *w* only if *w* contained a single counterpart of *i* that satisfies '$\Phi(x) \,\&\, \sim\Phi(x)$,' which is obviously impossible.)[25] The example of the two bosons illustrates this state of affairs. It's true at an S_1-world that *A* decays, since *A* has a decaying counterpart in that world, and it's also true at that world that *A* fails to decay, since *A* has a non-decaying counterpart in the world as well. (But it's not true at that world that *A* both decays and fails to decay, since *A* doesn't have counterparts that both decay and fail to decay.) Since the anti-haecceitist rejects (17), and since (17) is needed for the derivation of principles (14) and (15) from the probability axioms and (6), the anti-haecceitist will also reject that derivation.

Is there some easy way in which the anti-haecceitist could revise principle (7) to get around the problems outlined in this section? I assumed that $ch_t(P)$ equals the chance measure of the set of worlds that represent that *P*. I assumed further that, according to the anti-haecceitist, a world represents that $\Phi(a)$ just in case it contains *some* counterpart of *a* that satisfies '$\Phi(x)$.' Since a single world can contain several counterparts of a single object, this account entails that a world can represent that $\Phi(a)$ while at the same time representing that $\sim\Phi(a)$. That's why principles (14) and (15) fail. Can we fix the problem by tweaking the account of what it is for a world to represent that $\Phi(a)$? What about the following view: *u* represents that $\Phi(a)$ just in case *u* contains some counterpart of *a* and *every* counterpart of *a* that exists in *u* satisfies '$\Phi(x)$'? On that account, a single world cannot represent both that $\Phi(a)$ and that $\sim\Phi(a)$. But another, equally serious problem

[25] By anti-haecceitist lights, it's possible for a world to represent that *Fa* and also to represent that ~*Fa*, but no world can represent that (*Fa* & ~*Fa*). So, representation by worlds (truth at a world) isn't closed under conjunction. Is that an implausible conclusion? As mentioned in footnote 7, I think that, in the senses in which I'm using 'represent' and 'truth at a world,' they may express concepts different from the ordinary notions of representation and truth. We should therefore not expect that we can consult pre-theoretical intuition to find out how the concepts expressed by the two terms behave. If it sounds implausible to deny closure under conjunction, then that may be because we're confusing the notions expressed by the two phrases with the ordinary concepts of representation and truth. I don't hold it against anti-haecceitism that it commits us to denying that truth at a world and representation by a world are closed under conjunction.

arises now: a world can contain a counterpart of *a*, but it may neither represent that $\Phi(a)$ nor that $\sim\Phi(a)$, since it could be that some counterparts of *a* in the world satisfy '$\Phi(x)$' while others satisfy '$\sim\Phi(x)$.' That is indeed the case in the above example. The S_1-worlds in OP_t contain a decaying and a non-decaying counterpart of *A*. So, on the new account these worlds neither represent that A nor that ~A. The S_0-worlds are the only worlds in OP_t that represent that ~A, and the S_2-worlds are the only worlds in OP_t that represent that A. So, if $ch_t(S_1) \neq 0$, then $ch_t(A)$ and $ch_t(\sim A)$ don't sum to one. (14) still fails. So does (15). For, even on the new account, $ch_t(A \text{ or } \sim A) = 1$, since every world in OP_t contains a counterpart of *A* and every counterpart of *A* in any world in OP_t satisfies '*x* decays or *x* fails to decay'. Hence, if $ch_t(S_1) \neq 0$, then $ch_t(A \text{ or } \sim A) = 1 > ch_t(A) + ch_t(\sim A)$, contrary to (15).

To avoid the failure of (14) and (15), the anti-haecceitist needs a theory according to which every world in OP_t represents that A if and only if it doesn't represent that ~A. How would such an account go? Try this. If '$\Phi(a)$' is atomic, then *v* represents that $\Phi(a)$ just in case *v* contains some counterpart of *a* that satisfies '$\Phi(x)$.' Truth at a world can then be defined recursively for compound sentences in the obvious way: *v* represents that $\sim\Phi(a)$ just in case *v* does not represent that $\Phi(a)$, etc. But that looks like a non-starter, since what's true at a given world now seems to depend on what the primitive predicates (and hence the atomic sentences) of the language are. If we start with 'decays' as a primitive predicate, then '*A* decays' is atomic. Then '*A* decays' is true at all worlds in OP_t that contain a decaying counterpart of *A*, that is, in all S_1- and S_2-worlds, and '*A* doesn't decay' is true at all worlds that contain no such counterpart of *A*, that is, all S_0-worlds. So, $ch_t(A) = ch_t(S_1) + ch_t(S_2)$, $ch_t(\sim A) = ch_t(S_0)$. If we instead start with a primitive predicate '*F*' that is true of an *X* boson just in case that boson continues to exist (doesn't decay), then '*A* is *F*' is true in all worlds where some counterpart of *A* fails to decay, that is, in all S_0- and S_1-worlds, while '*A* is not *F*' is true in all S_2-worlds. So, $ch_t(A \text{ is } F) = ch_t(S_0) + ch_t(S_1)$ and $ch_t(A \text{ is not } F) = ch_t(S_2)$. But that's absurd. '*A* is *F*' ought to be true in just those worlds where '*A* doesn't decay' is true. $ch_t(A)$ ought to equal $ch_t(A \text{ is not } F)$ and $ch_t(\sim A)$ ought to equal $ch_t(A \text{ is } F)$.

I suspect that no simple revision of principle (7) will solve the problems for anti-haecceitism considered in this section. More substantial revisions will be considered in section 5.

4. The role of possibilities in the theory of counterfactuals

4.1 *The argument*

On the standard view of counterfactuals, which (ignoring some aspects of it that are irrelevant to the present topic) I take to be essentially correct,

(18) A counterfactual '$P \mathrel{\Box\!\!\rightarrow} Q$' is true at possible world *u* just in case *Q* is true at all the possible *P*-worlds that are closest (most similar overall) to *u*.[26]

I will argue that this account yields unacceptable predictions unless we endorse a haecceitist account of possible worlds.

An example will help to bring this out. Let *w* be a possible world that is indeterministic and, before time *t*, perfectly symmetrical. (By sheer coincidence, all chance processes before *t* have the same outcomes in the two halves of the universe.) Fred lives in one half of the universe. Twin-Fred, who is qualitatively indistinguishable from Fred before *t*, lives in the other half. Fred and Twin-Fred are both professional contortionists, and they are the only ones in the history of *w*. At *t*, the two halves of the universe diverge from one another. At that moment, Fred and Twin-Fred are both deciding whether to have tea or coffee for breakfast. Fred decides to go for coffee, while Twin-Fred chooses tea. Both decisions are genuinely indeterministic. The difference in their breakfasts causes a few other differences later on. For example, there is a used tea bag in Twin-Fred's garbage, but not in Fred's. But let's suppose that the events that are causally unaffected by the choice of breakfast drinks are exactly alike in the two halves of the universe.

In *w*, it's surely true that

[26] This theoretical framework is due to Stalnaker (1968) and Lewis (1973). Other significant work done in this framework includes Jackson (1977), Bennett (1984, 2003), and Lewis (1986a), in addition to the writings mentioned later on in this paper.

(19) If Fred had chosen tea rather than coffee, then there would have been two tea-drinking contortionists immediately after *t*.

To make this entirely clear, suppose that God foreordained that the world will instantly become a paradise if there are at least two tea-drinking contortionists immediately after *t*. Upon hearing this and finding out that Twin-Fred had tea, Fred might exclaim:

> Oh no! If only I had had tea! Then there would have been two tea-drinking contortionists and we would be living in paradise.

Surely, Fred is right.

The same conclusion can be made plausible in other ways, too. After all, there is no causal connection between Fred's decision about what to drink and Twin-Fred's simultaneous decision. (The two events occur at the same time in different places, and let's suppose that in *w* no causal signal can travel instantaneously.) It therefore seems that Twin-Fred would have made the same decision if Fred's decision had been different. So, if Fred had chosen tea, there would have been two tea-drinking contortionists.[27]

The anti-haecceitist cannot accommodate our impression that (19) is true. My argument for this conclusion will rest on two premises.

a. *Twin-Fred is a counterpart of Fred.*

The counterpart theorist cannot plausibly deny this. Let $P_{\text{Twin-Fred}}$ be the conjunction of all the purely qualitative properties that Twin-Fred has in *w*, including relational properties, negative properties, etc. (The statement that someone has this property constitutes a complete description of all qualitative features of the world.) It seems undeniable that

(20) It's (metaphysically) possible that Fred has $P_{\text{Twin-Fred}}$.

After all, all it would have taken for Fred to have $P_{\text{Twin-Fred}}$ is for each of the two contortionists to choose a different breakfast drink. And before time *t*, there was a non-zero chance that exactly that would happen. So, surely it *could* have happened. That

[27] For a defense of the principle that, roughly speaking, all matters of particular fact that are causally independent of the antecedent-event should be held fixed in counterfactual reasoning, see Adams (1975, ch. 4, sct. 8, in particular 132f.), Edgington (2003), Mårtensson (1999), Bennett (2003, ch. 15), Schaffer (2004), Hiddleston (2005), Kment (2006), and Wasserman (2006).

means that there is a possible world that represents Fred as having $P_{\text{Twin-Fred}}$. But such a world is qualitatively indistinguishable from *w*, and by anti-haecceitist lights, there are no qualitatively indistinguishable worlds that differ in what's true at them concerning specific individuals. Hence, *w* itself must represent Fred as having $P_{\text{Twin-Fred}}$. That's to say, *w* must contain a counterpart of Fred who has $P_{\text{Twin-Fred}}$. But that can only be Twin-Fred, since Twin-Fred is the only denizen of *w* who has $P_{\text{Twin-Fred}}$. So, Twin-Fred must be a counterpart of Fred.[28, 29]

b. *Weak Centering*

That's the assumption that every world is at least as close to itself as any other world is to it. This assumption is not to be confused with the principle of Strong Centering, according to which every world is *closer* to itself than any other world is to it. Weak Centering, in contrast to Strong Centering, allows for the possibility that a world *u* is tied with other worlds for the title of world that is closest to *u*. While some philosophers have objected to Strong Centering, Weak Centering seems to be widely accepted.[30] In fact, Weak Centering may seem self-evident. How could a world be more similar overall to *u* than *u* is to itself?

Now consider counterfactual (19) again. By anti-haecceitist lights, (19) is true just in case all the worlds closest to *w* where a counterpart of Fred has tea contain two tea-drinking contortionists. But since Twin-Fred is a counterpart of Fred, *w* itself contains a

[28] In his (1968, 114, Postulate P5), Lewis denies that it is possible for an individual to be a counterpart both of itself and of another individual in the same world, but it seems to me that the argument just given shows this view to be indefensible (and Lewis himself eventually changed his view on the matter; see, for example, Lewis (1986b, ch. 4).

[29] Recall that on Lewis's definition, an individual *x* in world *v* can be a counterpart of *y* only if there is nothing else in *v* that is more qualitatively similar overall to *y* than *x* is. How, then, can Twin-Fred be a counterpart of Fred on Lewis's definition? Isn't there something in *w* that is more similar to Fred than Twin-Fred, namely Fred?

In response, the anti-haecceitist can point out that the relation of overall similarity used to define the counterpart relation rests on a different method of weighting similarities than our offhand judgments about overall similarity. (See Lewis (1986a), where Lewis makes the same point about the relation of overall similarity used in defining the counterfactual conditional.) The rules defining the counterpart relation may assign zero weight to some respects of similarity. In our example, for instance, the similarities that Fred has to himself but not to Twin-Fred may carry no weight whatsoever, so that Twin-Fred counts as being as similar to Fred as Fred is to himself. (See section 4.2 for more discussion of this point.)

[30] The principles of Strong and Weak Centering are discussed in Lewis (1973). See Bennett (2003) for an argument against Strong Centering.

counterpart of Fred who has tea. And by Weak Centering, *w* is one of the worlds closest to *w* that satisfy this condition. But *w* contains only one tea-drinking contortionist. So, (19) is false at *w*. The anti-haecceitist needs to say that it's true at *w* that, if Fred had had tea, then there might still have been only one tea-drinking contortionist.[31]

No similar problem arises for the haecceitist. In contrast to the anti-haecceitist, the haecceitist doesn't believe that it's true at *w* that Fred has tea. There is indeed a world qualitatively exactly like *w* where Fred has tea, but that world is distinct from *w*. And it's not among the worlds closest to *w* where Fred has tea. The closest such worlds are those where everything that is causally unaffected by Fred's decision about his breakfast drink is just the way it is in *w*. In particular, in the closest worlds where Fred has tea, Twin-Fred still chooses tea.[32] In these worlds, there are two tea-drinking contortionists (and the world turns into paradise). So, by haecceitist lights, (19) is true at *w*.

4.2 *An anti-haecceitist reply: context-dependence*

It is time to consider a reply that the anti-haecceitist reader has been waiting impatiently to make while reading the last section. The standards of similarity that govern the counterpart relation are usually regarded as context-sensitive. Consider

(21) The bronze picture frame in my study could have been a vase.

That sentence may be true in one context but false in another. In the first context, we are using a counterpart relation that is permissive enough to count certain otherworldly vases as counterparts of the frame. In the second context, the conditions for counterparthood are stricter, so that no otherworldly vases are counterparts of the frame. In the course of a conversation, the standards of similarity can change, for example by the rule of accommodation. As soon as you utter (21), your audience, if cooperative, will change the

[31] I am following David Lewis (1973, 21) in using 'If *P* had been the case, then *Q might* have been the case' as equivalent to 'it's not the case that if *P* had been the case, then *Q would not* have been the case,' that is, as roughly equivalent to the claim that the closest *P*-worlds include some *Q*-worlds.

[32] On this view, then, some of the worlds that are qualitatively indistinguishable from *w* (namely those where Fred and Twin-Fred swap qualitative roles) are less close to *w* than some worlds that differ qualitatively from *w* (namely those where both contortionists have tea). That shows that closeness isn't purely a matter of qualitative similarity. It also matters to the degree of closeness between two worlds how similar they are with respect to the way qualitative properties and relations are distributed over specific individuals.

standards of similarity to turn the otherworldly vase into a counterpart of our worldmate, the frame.

My argument in the last section started from the assumption that (20) is true. I concluded that Twin-Fred must be a counterpart of Fred. Then I used that result to draw conclusions about what the anti-haecceitist has to say about (19). At this point, anti-haecceitists might complain that I have overlooked the possibility that the standards of similarity that define the counterpart relation change when we shift our attention from (20) to (19). And anti-haecceitists could try to appeal to such a shift to explain away the apparent counterexample. To be more concrete, they could argue as follows:

> When we consider (20), Twin-Fred counts as a counterpart of Fred, which is why (20) is true. When we then go on to consider (19), however, Twin-Fred no longer counts as Fred's counterpart, and *w* (the world of the example) therefore doesn't count as containing a tea-drinking counterpart of Fred. *w* consequently doesn't count as an antecedent-world, and hence doesn't count as one of the antecedent-worlds closest to *w*. Instead, the closest antecedent-world is a world (call it 'w_{2tea}') that is just like *w* before *t* and where *both* contortionists then have tea. That's why (19) is true at *w*.

Call the two tea-drinking contortionists in w_{2tea} 'Ed' and 'Twin-Ed.' The anti-haecceitist's proposal assumes that Twin-Fred is a counterpart of Fred in a context where we consider (20), while in a context where we consider (19), Ed and Twin-Ed are counterparts of Fred, while Twin-Fred isn't. Let's consider how this proposal could be worked out. Suppose first that the anti-haecceitist endorses Lewis's definition of the counterpart relation: *x* in world *u* is a counterpart of *y* just in case *x* meets certain minimum standards of similarity to *y* and nothing in *u* is more similar to *y* than *x* is. The two clauses of this definition give us two possible explanations of how the shift in the extension of the counterpart relation proposed by the anti-haecceitist could have come about.

> *Explanation 1*. In the context where we consider (20), Twin-Fred has the minimum degree of similarity to Fred required to be his counterpart. When we turn our attention

to (19), the minimum requirements increase and while Ed and Twin-Ed meet the new minimum requirements, Twin-Fred doesn't.

Ed and Twin-Ed differ from Fred in their choice of breakfast drink and its consequences, but are otherwise qualitatively indistinguishable from Fred in every way. Twin-Fred differs from Fred in the same ways, but there's an additional difference as well: while Fred has a *tea*-drinking twin off in a distant corner of the universe (and the same is true of Ed and Twin-Ed), Twin-Fred has a *coffee*-drinking twin. As far as I can see, that is the only way in which Ed and Twin-Ed are more similar to Fred than Twin-Fred is. It is this extra similarity to which the anti-haecceitist who gives Explanation 1 must appeal. In the context where we consider (19), Ed and Twin-Ed are only just similar enough to Fred to count as his counterparts. Twin-Fred, having an extra dissimilarity from Fred, is below the threshold. In the context where we consider (20), by contrast, the minimum requirements for counterparthood are lower, and Twin-Fred still counts as a counterpart of Fred.

The *second* explanation of the contextual shift appeals to the fact that, in order to be a counterpart of Fred by Lewis's definition of counterparthood, Twin-Fred must not have a worldmate who is more similar to Fred than he (Twin-Fred) is. Whether Twin-Fred meets this condition depends on whether Fred counts as more similar overall to himself than Twin-Fred is to Fred. That, in turn, depends on the specific standards of overall similarity that are in force in the context, that is, on the specific method of weighting the different respects of similarity. And these standards can change. Hence, we get

> *Explanation 2*. By the standards of similarity that are relevant in the context where we consider (20), Twin-Fred counts as being as similar to Fred as Fred is to himself. By the standards in force when we consider (19), he counts as less similar to Fred than Fred is to himself.

Fred, of course, is similar to himself in some ways in which Twin-Fred is not similar to him, namely in his choice of breakfast drink and its consequences, and in having a tea-drinking twin. In the context where we consider (20), these similarities enter the scales with zero weight. Fred and Twin-Fred come out as equally similar overall to Fred, and Twin-Fred is therefore a counterpart of Fred. When we consider (19), by contrast, the

same similarities carry non-zero weight, so that Twin-Fred counts as less similar to Fred than Fred is to himself. Twin-Fred no longer counts as a counterpart of Fred.

These two explanations rested on Lewis's definition of counterparthood. The anti-haecceitist, of course, might prefer the simpler alternative definition considered in section 2, which simply omits the second clause of Lewis's definition. According to this definition, *x* is a counterpart of *y* if and only if *x* is sufficiently similar to *y*. Endorsing that definition does not, however, put the anti-haecceitist in a better position to answer the challenge. On the contrary, the only effect is to make Explanation 2 unavailable, leaving the anti-haecceitist with Explanation 1 as the sole option.

So much about the two changes in the standards of similarity that anti-haecceitists could postulate to explain the phenomena. It seems to me, however, that the hypothesis that the standards shift in one of these ways is entirely *ad hoc* as long as no independent reason can be given for believing it. I don't know of any such reason. What is more, anti-haecceitists who believe in the shift owe us an account of the mechanism that generated it. They need to explain what underlying changes in the contextual parameters prompted the shift, and what the pragmatic rules are that ordain that these changes affect the standards of similarity in the ways described. Without such an account, anti-haecceitists are not able to *predict* or *explain* the shift, and their account therefore cannot predict or explain our judgments about the relevant modal claims. But surely, predicting and explaining our judgments about the likes of (19) and (20) are two of the principal purposes of an account of modal claims.

What is more, there are strong reasons for doubting the anti-haecceitist's claim that in the context where we consider (19), Twin-Fred doesn't count as a counterpart of Fred. I suspect that the anti-haecceitist cannot plausibly say that there is *any* context in which that is true. Note that in any context in which Twin-Fred fails to count as a counterpart of Fred, it would be true that

(22) It is (metaphysically) impossible for Fred to have $P_{\text{Twin-Fred}}$.

But (22) simply *sounds* false. All it would have taken for Fred to have $P_{\text{Twin-Fred}}$ is for Fred and Twin-Fred each to choose a different breakfast drink. And surely that's metaphysically possible! After all, it seems that just before their breakfasts there was a

non-zero chance that it would happen. I don't know how to create a context in which (22) sounds even remotely plausible. But that would be hard to explain if the anti-haecceitist were right in thinking that the counterpart relation is flexible enough to allow for contexts in which Twin-Fred fails to be a counterpart of Fred. If the counterpart relation is that flexible, then why can't we create a context where (22) is true simply by uttering (22) and relying on our audience to apply the rule of accommodation? It seems to me that the simplest and most plausible explanation for the fact that (22) never sounds true is that it is false in every context. Counterpart theorists can allow the counterpart relation to vary across contexts, but only within limits. They cannot allow for a context where someone as similar to Fred as Twin-Fred fails to be Fred's counterpart.

5. Anti-haecceitist replies

I will discuss two very natural responses that an anti-haecceitist might make to the problems discussed in sections 3 and 4. Both strategies reject principles (6) and (18) and offer replacements. As we will see, essentially the same objection applies to both of them. I suspect that the difficulty generalizes to other attempted fixes of anti-haecceitism that may be proposed.

5.1 *World description theory*

I argued that to get the right predictions about chance and counterfactuals, we have to accept that there are pairs of qualitatively indistinguishable worlds that differ in what they represent about specific individuals. Only haecceitists allow for such pairs. However, whenever haecceitists distinguish between two different worlds that are qualitatively indistinguishable but differ in what they represent about specific individuals, anti-haecceitists distinguish between different ways of describing a single world. These different descriptions correspond to different mappings from individuals in that world to their counterparts. And anti-haecceitists may try to exploit that distinction for the same purposes for which haecceitists use their distinction between qualitatively indistinguishable worlds that represent different things about specific individuals.

As a first step, anti-haecceitists can define what they may call 'possible world descriptions.' A possible world description is an ordered pair consisting of a possible world *u* and a (possibly partial) function from individuals in *u* to individuals that are their counterparts. In addition to the familiar notion of truth at a *world*, we can define the notion of a claim's being true at a *world description*. A purely qualitative claim is true at a world description <*u*; *f*> just in case it is true at world *u*. A claim about a specific individual, let's say the claim that *a is P*, is true at a world description <*u*; *f*> just in case, where *b* is the individual in *u* to which *f* assigns *a*, *b* is *P*.

The anti-haecceitist can then define the chance measure, not on the set of possible worlds, but on the set of possible world descriptions. $ch_t(P)$ equals the measure of the set of world descriptions where *P* is true. Similarly, the world descriptions, not the worlds, are the relata of the closeness relation. If we call a world description where the claim *P* is true a '*P*-world description,' we can say that a counterfactual '$P \mathrel{\Box\!\!\rightarrow} Q$' is true at world description *u* just in case *Q* is true in all those *P*-world descriptions that are closest to *u*. The principle of Weak Centering can be reformulated as the principle that any world description *u* is at least as close to *u* as any other world description is to *u*.

Call the theory just stated 'world description theory.' World description theory can solve the problem cases of sections 3 and 4 without difficulty. In the X boson example, there are two different sets of world descriptions corresponding to the set of possible worlds in OP_t where exactly one particle decays. One of these sets includes only world descriptions that map the decaying particle to *A* and the non-decaying one to *B*, the other includes the world descriptions with the opposite mapping. The chance measure of each of these sets of world descriptions is 25%. The set of world descriptions where both particles decay also has a 25% chance, as does the set of world descriptions where neither particle decays. This chance measure yields the intuitively correct results. In particular, $ch_t(A) = ch_t(B) = ch_t(B/A) = 50\%$. $ch_t(S_0) = ch_t(S_2) = 25\%$. $ch_t(S_1) = 50\%$. And since every world description corresponding to a world in OP_t represents *A* either as decaying or as not decaying, but not both, $ch_t(\sim A) = 1 - ch_t(A)$.

Consider next the case of world *w* described in section 4.1, which is inhabited by the two contortionists. There are two relevant world descriptions that have *w* as their first

member: the pair <*w*; I> consisting of *w* and the identity mapping on the individuals in *w*, and a world description <*w*; *f*> that differs from the latter by mapping Fred to Twin-Fred and Twin-Fred to Fred. By Weak Centering, <*w*; I> is as close to <*w*; I> as any world description is to <*w*; I>. World description <*w*; *f*> is farther away from <*w*; I> than a world description where both contortionists have tea. (19) comes out true.

My brief sketch of world description theory underspecifies the view in a number of ways, but there is no need to develop the account any further, as the main problem for the theory is independent of the details. Let me explain. While the *expression* 'possible world' may be a technical term, it seems plausible to me that the *concept* it expresses is familiar from non-philosophical contexts. Roughly speaking, it is the notion of a (maximally specific) way things could be. We have various beliefs about ways things could be before we enter the philosophy room. I happen to think that (6) and (18) are nothing more than philosophically sophisticated versions of such pre-philosophical beliefs. That is bound to be very controversial in the case of (18) (and I cannot argue for the claim here). But it seems very plausible in the case of (6), even in the absence of a detailed argument. It's very natural to think that, when we talk about the chance that a certain way for the world to be had on Sunday. (6) is simply a more precise statement of this thought.

Let us assume, then, that at least one of (6) and (18) is a version of a principle that is part of the folk theory about ways things could be. Now, according to world-description theorists, neither (6) nor (18) is true of the entities they call 'worlds'; both claims hold of *world descriptions* instead. That means that the entities they call 'worlds' don't play the role we associate with worlds pre-philosophically. That role is taken over by the world descriptions. But it seems plausible that what entities our thoughts and utterances about worlds (or about ways things could have been) are about is determined in large part by the (folk-)theoretical role associated with the concept of a world. If the entities that best fit this role are the world descriptions, then, other things being equal, these entities are better candidates for being the referents of 'world' than the entities which the world description theorists call 'worlds.' So, world description theorists seem simply to be misdescribing their own account. If their view is correct, then the world descriptions are

really the possible worlds (they are the things we are talking about when we speak of ways things could be). But world descriptions satisfy the haecceitist's conception of worlds, not the anti-haecceitist's. For clearly, there can be world descriptions where the same qualitative claims are true, but where different claims about specific individuals hold. World description theory, when correctly described, turns out to be a version of haecceitism.

There are a few ways for world description theorists to respond. For a start, they could deny that any version of either (6) or (18) is part of folk theory about ways things could be, or that folk theory really plays such an important role in determining the reference of 'world.' I don't myself find these responses plausible, and will instead focus on a different reply the world description theorist may give, which exploits a loophole in the foregoing argument. I said: since the world descriptions fit the (folk-)theoretical role of worlds better than the entities which the world description theorist calls 'worlds,' the world descriptions are better candidates for being the referents of 'world,' *other things being equal*. But world description theorists may argue that other things are *not* equal. Following Lewis, they may claim that satisfying the theoretical role is only one *desideratum* for candidate referents of 'world.' It needs to be weighed against the desideratum of naturalness.[33] And perhaps world description theorists can present an account of what they call 'worlds' that makes it plausible that these entities are, on account of their greater naturalness, significantly more eligible candidates for being the referents of 'world' than world descriptions.

For an illustration of how this line could be developed, consider Lewisian modal realism. If Lewisian worlds existed, they would be very natural subdivisions of reality, and they would be a more natural kind of thing than pairs consisting of a Lewisian world and a mapping of its constituent individuals to certain of their counterparts. From the Lewisian perspective, therefore, we could argue that 'world' refers to Lewisian worlds, rather than to world descriptions, even if the latter fit the theoretical role of worlds better.

This specific version of world description theory is unlikely to appeal to many anti-haecceitists, given the implausibility of Lewisian realism. (Not only does this view carry

[33] Lewis 1983, 1984.

dubious ontological commitments and offend widely shared actualist sentiments, but modal realism seems even less plausible once we realize that Lewisian worlds satisfy the theoretical role of worlds only imperfectly, for then the account necessitates revisions in our view of worlds.) What if we jettison modal realism in favor of an ersatzist conception of worlds? In that case, it is less obvious how to argue that worlds are decisively more natural than world descriptions. Consider, for example, a linguistic ersatzist who claims that a world is an infinitely complex Ramsey sentence, while a world description is a pair consisting of a Ramsey sentence *u* and an assignment of its constituent individuals (that is, centered worlds <*u*; *v*>) to other individuals. Admittedly, on this view world descriptions are slightly more complex set-theoretic constructions than the worlds themselves, and are therefore perhaps a little bit less natural. But it would be implausible to hold that this very small difference in naturalness by itself makes worlds so much more natural than world descriptions that it outweighs the fact that the world descriptions satisfy the theoretical role of worlds more closely. Ersatzist world description theorists would need to give us some other reason for believing that the entities they call 'worlds' are sufficiently more natural to count as the referents of 'world.' I don't know whether and how that could be done and will leave it as a challenge to the proponents of the view.[34]

It's worth noting that, if this project can be carried out successfully, the resulting anti-haecceitist position would be a revisionist account. There is nothing in our ordinary conception of possibilities (of ways things could be, of possible worlds) that suggests that possibilities fit the anti-haecceitist's conception. On the contrary, we appear commonly to think of possibilities haecceitistically. It's just that nothing among the reasonably natural subdivisions of reality answers to our ordinary conception of possibilities. What forces us

[34] To take up a modified version of a suggestion by one of the reviewers, perhaps the ersatzist world-description theorist could argue roughly as follows. There is a pair of modal operators (a necessity and a possibility operator) that are fairly natural. Possible worlds are defined in terms of them, while world descriptions are, in turn, defined in terms of possible world. It's because of the greater definitional proximity of worlds to these natural modal operators that worlds count as significantly more natural than world descriptions, and this greater degree of naturalness is sufficient to outweigh the fact that world descriptions fit the theoretical role of worlds more closely. Needless to say, this view needs to be fleshed in and defended in detail before it can be properly evaluated. That is a task for future work.

to become anti-haecceitists is not an insight about our modal concepts, but one about ontology.

5.2 *Sub-world possibilia theory*

Consider again the example of the two tea-drinking contortionists, and let P_{Fred} and $P_{\text{Twin-Fred}}$ be, respectively, the conjunction of all of Fred's qualitative properties and of all of Twin-Fred's. Both of these are properties that Fred could have had. And yet, the anti-haecceitist denies that there are two different types of possible worlds, one where Fred has P_{Fred} and one where he has $P_{\text{Twin-Fred}}$. But, as David Lewis has pointed out, anti-haecceitists can accommodate the idea that there are two different *possibilities* in examples like this, provided they don't think of these possibilities as possible worlds.[35] There aren't two different ways *the world* could have been; the world would have been just the same whether Fred has P_{Fred} or $P_{\text{Twin-Fred}}$. Instead, there are two different ways *Fred* could have been. Just as possible worlds are ways the world could have been, certain proper parts of possible worlds are ways proper parts of the world could have been. To be more precise, any counterpart of x in any possible world is a way x could have been. The world of the example supplies two counterparts of Fred, viz. Fred and Twin-Fred, and these two people are two ways Fred could have been. Of these two ways for Fred to be, the first, Fred, represents Fred has having P_{Fred}, while the second, Twin-Fred, represents Fred as having $P_{\text{Twin-Fred}}$.

Just as there are possibilities for single individuals, there are possibilities for several individuals taken collectively. For instance, among the possibilities for the two bosons in the example of section 3, there is one where *A* decays while *B* continues to exist, and one where *B* decays while *A* continues to exist. These possibilities are ordered pairs that are counterparts of the pair <*A*; *B*>. A world in OP_t where one boson, *C*, disappears while another boson, *D*, continues to exist supplies two counterparts of the pair <*A*; *B*>, namely <*C*; *D*> and <*D*; *C*>. These are two different ways *A* and *B* could have been. The first represents *A* as decaying and *B* as continuing to exist, while the second represents the opposite state of affairs.

[35] (1986b, ch. 4).

The basic idea of Lewis's proposal is that some of the work that is usually ascribed to possible worlds (for example that of representing ways certain individuals could have been) is really done by the proper parts of worlds. It's natural to try to generalize this account to solve the difficulties mentioned in sections 3 and 4. Consider first the problem concerning counterfactuals. The standard semantics relies on an ordering of possible worlds by their closeness to each other. But why restrict the closeness ordering to possible worlds (that is, to ways the world as a whole could have been)? Why not employ a more general closeness relation which, for any given object, orders all possible ways that object could have been (that is, all counterparts of that object) by their overall similarity to the object? We could then use that generalized closeness ordering to account for *de re* counterfactuals of the form

(23) $\Phi(a_1, a_2, \ldots, a_m) \ \square\!\!\rightarrow \ \Psi(a_{m+1}, a_{m+2}, \ldots, a_n)$.

On the modified account, (23) is true just in case all the closest counterparts of $<a_1, \ldots, a_n>$ that satisfy the open sentence '$\Phi(x_1, x_2, \ldots, x_m)$' also satisfy the open sentence '$\Phi(x_1, x_2, \ldots, x_m) \supset \Psi(x_{m+1}, x_{m+2}, \ldots, x_n)$' (or something like that).

This account can be used to solve the problem case of world *w* described in section 4.1, which is inhabited by the two contortionists Fred and Twin-Fred. Where *a* and *c* are counterparts of *b*, let us write '$a <_b c$' for '*a* is closer to *b* than *c* is,' '$a =_b c$' for '*a* and *c* are equally close to *b*,' and '$a \leq_b c$' for '$(a <_b c)$ or $(a =_b c)$.' There are two worlds to consider: *w*, and a world (call it '$w_{2\text{tea}}$') that is like *w* before *t* but where both contortionists then choose tea. And there are four relevant counterparts of Fred: Fred and Twin-Fred in *w*, and the two contortionists in $w_{2\text{tea}}$ (call them, once again, 'Ed' and 'Twin-Ed'). A straightforward generalization of the principle of Weak Centering tells us that $x \leq_x y$ for all *x* and *y*. So, Fred must be among the counterparts closest to Fred. Ed and Twin-Ed are qualitatively indistinguishable, so that each of them must be as close to Fred as the other. But how does their degree of closeness to Fred compare to the degree of closeness between Fred and Twin-Fred? Well, Ed, Twin-Ed and Twin-Fred all differ from Fred in deciding to have tea rather than coffee (and in matters caused by that decision). For Ed and Twin-Ed that's the *only* difference from Fred. Twin-Fred, by contrast, differs from Fred in an additional way: Fred has a tea-drinking twin in the other

part of the universe, while Twin-Fred has a coffee-drinking twin. So, it seems reasonable to think that Ed and Twin-Ed are more similar overall to Fred than Twin-Fred is. That gives us the following closeness ordering:

$$\text{Fred} \leq_{\text{Fred}} \text{Ed} =_{\text{Fred}} \text{Twin-Ed} <_{\text{Fred}} \text{Twin-Fred}.$$

So, of all tea-drinking counterparts of Fred, Ed and Twin-Ed are the ones closest to Fred. And of course Ed and Twin-Ed satisfy 'there are two tea-drinking contortionists,' since their world contains two tea-drinking contortionists. So, according to the anti-haecceitist's new account of *de re* counterfactuals, (19) comes out true, just as pre-philosophical opinion tells us.

Proper parts of worlds can also be regarded as bearers of chance. That is to say, just as we can define a chance measure on the set of possible worlds that represents the chances of different possible ways the world could have been, we can define a chance measure on the set of all counterparts of a thing *x* to represent the chances of different possible ways for *x* to be. The chance that *x* is *F* equals the chance measure (if defined) of the set of those counterparts of *x* that are *F*. Now consider the two-particle example of section 3 again. There are four relevant sets of counterparts of the pair of X bosons <*A*; *B*>. The first of these is the set of pairs of two decaying X bosons, the second is the set of pairs of two non-decaying ones. Each of these sets has a chance measure of 25%. Worlds where one X boson decays and one doesn't provide two more types of counterpart of <*A*; *B*>, viz. pairs of X bosons whose first member decays and whose second member doesn't, and pairs whose second member decays but whose first member doesn't. Pairs of the first kind represent *A* as decaying and *B* as not decaying, while pairs of the second kind represent *B* as decaying and *A* as not decaying. The chance measure of the set of pairs of the first kind is 25%, and the chance measure of the set of pairs of the second kind is 25% as well. The chance that *A* decays equals the chance measure of the set of those counterparts of <*A*; *B*> whose first member decays; that's 50%. The chance that *A* fails to decay equals the measure of the set of those counterparts of <*A*; *B*> whose first member doesn't decay. That is 50% as well. The chance that *A* decays and the chance that *A* doesn't decay sum to one, just as required by principles (14) and (15). By the same reasoning, *B* also has a 50% chance of decaying, and a 50% chance of not decaying. The

chance that *A* and *B* both decay equals the measure of the set of those counterparts of <*A*; *B*> both of whose members decay. That's 25%. Hence, the chance of *A*'s decaying conditional on *B*'s decaying is 50%. The two events are stochastically independent. We get the right results.

This view ascribes chances to proper parts of worlds. But note that these chance ascriptions need to be relativized to specific entities that the chance bearers are counterparts of. Suppose that Fred is a person in another world who is a counterpart of both you and me. Assume further that his life up to time *t* is exactly like yours up to *t*, but differs somewhat from my life up to *t*. Then at *t* there may be a non-zero chance that you will turn out to have exactly the same qualitative properties as Fred, while the chance is zero that the same will happen to me. So, at *t* Fred has a non-zero chance *when considered as a possibility for you*, but a chance of zero *when considered as a possibility for me*. In general, what we assign a chance to is *an individual x considered as a possibility for a certain individual y*.

Call the account outlined in this section 'sub-world possibilia theory,' since it assigns a central role to possibilia that are proper parts of worlds. My first comment on this theory is that, when combined with an ersatzist account of worlds (which seems to be the most reasonable theory of worlds), it looks to me like a notational variant of haecceitism. Suppose that sub-world possibilia theorists regard worlds as Ramsey sentences and cash out talk about the constituents of worlds in terms of centered worlds (as described in section 2). They will then define their chance measure over *centered worlds considered as possibilities for specific individuals.* A centered world considered as a possibility for *x* might be assigned a certain chance while the same centered world considered as a possibility for *y* might have a *different* chance. But that sounds like a notational variant of the haecceitist claim that there are two qualitatively indistinguishable worlds that differ in that the thing that is playing a certain role in the one world is *x* while the thing playing the same role in the other world is *y*, and these two worlds have different chances of being actualized.

The claim that ersatzist subworld-possibilia theory is haecceitism in disguise is admittedly somewhat impressionistic. Let me conclude this section by making a more

clear-cut point. I think that sub-world possibilia theory has to confront the very same argument that threatened to undermine world description theory. According to sub-world possibilia theory, worlds don't quite play the role we ordinarily associate with them. But even the sub-world possibilia theorist should admit that we can find entities, such as the world descriptions discussed in the previous section, that do satisfy the theoretical role of worlds. So, other things being equal, world descriptions should still look like better candidates for being the referents of 'worlds' than the entities which the sub-world possibilia theorist calls 'worlds.' So, why not conclude that the world descriptions are the possible worlds? That view, of course, would be a version of haecceitism. The rest of the dialectic is already familiar. Sub-world possibilia theorists may claim that the entities they call 'worlds' are more natural than world descriptions, but then they owe us an account of worlds that makes that claim plausible.

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