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Existentialism, aliens and referentially unrestricted worlds

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Abstract Existentialism claims that propositions that directly refer to individuals depend on those individuals for their existence. I argue for two points regarding Existentialism. First, I argue that recent accounts of Existentialism run into difficulties accommodating the possibility of there being a lonely alien electron. This problem is distinct from one of the better-known alien problems—concerning iterated modal properties of aliens—and can't be solved using a standard response to the iterated case. Second, though the lonely alien electron problem might seem to be reason to reject the sort of Existentialist view at hand, there's a plausible way to preserve the view: accept the existence of possible worlds that directly refer to individuals that don't exist in those worlds. Such a solution might seem incompatible with Existentialism, but I show that Existentialists can avoid the incompatibility and should find the resulting view plausible.

Keywords Existentialism · Serious actualism · Aliens · Possible worlds · Modality · Referentially unrestricted worlds

1 Introduction

The proposition <Socrates is wise> is said to 'directly refer' to Socrates. In contrast, the proposition <the father of western philosophy is wise> also refers to Socrates, but

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only *indirectly*—that is, only by way of Socrates' qualitative properties or relations to other individuals.[1] Existentialism is the view that propositions depend for their existence on the things that they are directly about. It therefore tells us that <Socrates is wise> doesn't exist in any possible world in which Socrates does not. Hence, given that Socrates contingently exists, propositions that directly refer to Socrates also contingently exist.

Many Existentialists think that Socrates possibly doesn't exist even though the proposition <Socrates does not exist> isn't true in any possible worlds. Nonetheless, they think this is acceptable because <Socrates does not exist> is still true *at* some possible worlds. Many have been skeptical that there's an intelligible notion of propositions being true *at* worlds without being true *in* them, but Adams (1981), Turner (2005), King (2007b), Stalnaker (2010, 2012) and Speaks (2012, 2016) have given accounts that seem to make sense of the notions.

In this paper, I argue that these accounts of the truth in/at distinction have trouble accommodating the possibility that the only material thing that exists is an alien electron (the "lonely alien" possibility). Instead, I suggest that we allow for the existence of referentially unrestricted possible worlds, where

> W is **referentially unrestricted**
> $=_{df}$ for some x, x doesn't exist in W and W directly refers to x.

For example, if a world in which Socrates doesn't exist directly refers to Socrates, it is referentially unrestricted.[2] (Note that I will assume, alongside Existentialists, that possible worlds are abstract objects of some sort—like propositions, states of affairs, properties, sets, etc.) Adams, Turner, King, Stalnaker[3] and Speaks all have accounts that are incompatible with the existence of referentially unrestricted worlds. But I argue that their existence is crucial to accommodating the lonely alien possibility. It might appear that the existence of referentially unrestricted possible worlds is incompatible with Existentialism (at least coupled with the sort of theses that the above authors accept[4]). But I will explain why there is no such incompatibility and that the suggestion should be taken as appealing.

The structure of the paper is as follows. In Sect. 2, I explain why Existentialists have found the need to posit and analyze the truth in/at distinction and I give one recent explication of the distinction. In Sect. 3, I present the lonely alien problem. In Sect. 4, I consider objections; in particular, I consider how Adams' account purports to avoid the problem and I distinguish the lonely alien problem from the well-known

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[1] Adams (1981: p. 12) and Kaplan (1989: p. 483) give this sort of definition.

[2] Here I leave the notion of "x exists in W" as undefined. But no matter how the authors mentioned define it, it still follows that they do not allow for referentially unrestricted worlds. In fact, part of the lesson of this paper is that we need to be careful about how to define such notions.

[3] Stalnaker seems to think that possible worlds don't directly refer at all. If so, it would follow straightforwardly that there are no referentially unrestricted worlds on his view.

[4] This sort includes Contingentism—the thesis that there are objects that contingently exists—and Serious Actualism—the thesis that objects can't have properties or bear relations in worlds in which they don't exist.

case of iterated modality concerning aliens that Existentialists already have solutions to. And finally, in Sect. 5, I develop an Existentialist-friendly account that incorporates referentially unrestricted worlds and explain how it addresses the lonely alien problem.

2 The truth in/at distinction

Here's an argument that purports to show the falsity of Existentialism:

(1) Possibly, Socrates doesn't exist.
(2) Necessarily, if Socrates doesn't exist, then <Socrates doesn't exist> is true.
(3) Necessarily, if <Socrates doesn't exist> is true, then <Socrates doesn't exist> exists.
(4) Therefore, possibly, Socrates doesn't exist and <Socrates doesn't exist> exists.[5]

Premises 1 and 2 seem plausible. And 3 follows from Serious Actualism—objects can't have properties unless they exist. But if 1-3 are all true, we get the possible falsehood of Existentialism. And this is problematic since Existentialism is usually thought of as necessary.

The popular response among Existentialists is to appeal to a distinction between ways propositions can be true relative to a world. As Kit Fine says:

> One should distinguish between two notions of truth for propositions, the *inner* and the *outer*. According to the outer notion, a proposition is true in a possible world regardless of whether it exists in that world; according to the inner notion, a proposition is true in a possible world only if it exists in that world. We may put the distinction in terms of perspective. According to the outer notion, we can stand outside a world and compare the proposition with what goes on in the world in order to ascertain whether it is true. But according to the inner notion, we must first enter with the proposition into the world before ascertaining its truth. (1985: p. 163)

The claim then is that the premises are ambiguous, and once disambiguated, the argument can be rejected (following Adams (1981) I will express this inner vs. outer distinction in terms of a proposition being 'true in a world' vs. 'true at a world'). If premise (2) is read as:

> (2') for any world W, if Socrates doesn't exist in W, then <Socrates doesn't exist> is true *in W*

then the premise can be rejected. This is because (2) only seems true because it seems that there must be some sense in which <Socrates doesn't exist> is true with respect to W. But once we make the in/at distinction, we can recognize that the proposition is still true *at W* rather than *in W*. That is, Existentialists can still accept the claim:

> (2") for any world W, if Socrates doesn't exist in W, then <Socrates doesn't exist> is true *at W.*

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[5] The *locus classicus* for this argument is Plantinga's (1983).

And if we reformulate all the premises of the Truth Problem in terms of *truth at W*, Existentialists could reject the premise:

> (3') For any world *W*, if <Socrates doesn't exist> is true *at W*, then <Socrates doesn't exist> exists in *W*.

The notion of being true *at* a world doesn't entail *existing* in that world.

Others have been skeptical that there really is a truth in/at distinction to be drawn here. Williamson says "there is an illusion of a distinction between truth in a world and truth [at] a world for propositions because we appear to be able to model such a distinction on the corresponding distinction for utterances" (2002: p. 240). Also, Plantinga calls it "picture thinking" since we can't literally stand outside of worlds and look into them (1985: p. 343).[6]

Many Existentialists have given accounts of the distinction in order to meet these objections. To give one recent example, Speaks (2012: p. 542) suggests that we look to the properties worlds instantiate. In particular:

> <Socrates does not exist> is true *at W* if and only if *W* instantiates the property <being such that, were it actual, Socrates would not exist>.

This analysis is appealing since it doesn't entail that <Socrates does not exist> would exist if *W* were actual—just what the Existentialist wants. But does it entail that a *property* that directly refers to Socrates would exist? If so, that seems no better. Fortunately, as Speaks (2012: p. 547–8) points out, this can be resisted: even though *W* actually instantiates properties that directly refer to Socrates, it *would not* instantiate those properties if *W* were actual.

A limitation of the above analysis is that it only analyzes one particular proposition. A more general account can be stated as:

> *p* is true *at W* if and only if *W* instantiates *p*'s truth condition.

As Speaks admits, spelling out the sorts of truth conditions he intends to give isn't a simple matter. We can start by spelling them out like this:

> If *p* is an **existential proposition** that attributes existence to *o*, then the truth condition for *p* is the following property of worlds: <being such that, were it actual, *o* would exist>.

> If *p* is the **negation of an existential proposition** that attributes existence to *o*, then the truth condition for *p* is the following property of worlds: <being such that, were it actual, *o* would not exist>.

Filling out the truth conditions in a way that applies to every kind of proposition isn't a trivial matter.[7] But it does seem that there should be some way to do it.

Even if Speaks' analysis is correct, we might still wonder if anything could instantiate <being such that, were it actual, Socrates wouldn't exist> on Speaks' view. For a

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[6] Davidson (2000) and Crisp (2005) also report similar worries with the notion.

[7] It's tempting to state the general principle like this: *p* is true at *W* if and only if were *W* actual, *p*. But as Speaks points out, this is ungrammatical since the first instance of '*p*' is in subject position and the second instance is in sentential position. Thus the need for the sort of piecemeal strategy that Speaks makes.

possible world to instantiate that property wouldn't it have to directly refer to Socrates in order to ensure that Socrates wouldn't exist if it were actual? For instance, if possible worlds are propositions of some sort, wouldn't the proposition need something like <Socrates does not exist> as a conjunct in order for it to instantiate the property? If so, then Speaks' analysis doesn't help the Existentialist escape the original problem.

But it might be responded that a proposition like

(∼ S) Plato, Aristotle, …, are all the individuals that exist

(where 'Plato, Aristotle, …' names all the individuals that would exist, and Socrates isn't on the list) is incompatible with Socrates' existence. That is, if ∼ S were true, then Socrates wouldn't exist. This should make it clear that a possible world can instantiate <being such that, were it actual, Socrates wouldn't exist> even if the world doesn't directly refer to Socrates.

3 The lonely alien problem

Nonetheless, I think there are other plausible modal claims that Speaks' view (and others like it) has trouble accommodating. Take, for example, the claim

(Lonely Alien) possibly, there is a lonely alien electron.

By 'lonely' I mean that the object is the only material thing that exists in that world. It may be difficult to demarcate what exactly counts as 'material'. But the point of importance is that the loneliness of an object allows for the existence of entities such as propositions (and other things that one's ontology might require there to be, like numbers, properties, sets, spiritual beings, regions of space, etc.). Let me also be explicit that by 'an alien x' I mean that x doesn't exist in @ (where '@' names the actual world). In this sense, it doesn't make sense to say 'relative to W, Socrates is an alien'; though it does make sense to say that Socrates doesn't exist in W.

Lonely Alien looks like the sort of proposition that we should want our modal theory to be compatible with.[8] But I think Speaks' and the others' accounts are incompatible

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[8] Furthermore, there's good reason to think it's true if we agree with both these claims:

(More Stuff) possibly, there are more electrons than there actually ever are,
(Loneliness) necessarily, for any electron, it is possibly a lonely electron.

The More Stuff principle is intuitively true. It seems to be a contingent fact that n is the number of electrons that there actually ever are. The Big Bang could have resulted in a vastly different universe, or there could have been a different number of occurrences of pair production, either of which could have resulted in more electrons. As for Loneliness, it also seems that there could have been much less mass and energy in the world than there actually is. Again, this could happen if the Big Bang occurred differently (perhaps a 'Small Bang'). Even if the universe in fact exists without a beginning, it could have eternally had less matter and energy than it in fact has. Such a world would be *contracted* from our perspective. But it would be arbitrary to think that it could only be contracted to a certain degree; once we admit that there could be a bit less matter and energy, we should admit that there could have been a world with even less, and then even less, and continuously on until we can contract the world down to a single electron that ever actually exists. It would also be arbitrary to think that the world could only be contracted down to *this* particular electron or *that* one. Likewise, it would be arbitrary to think that a world could only be contracted down to an electron that only *actually* exists. That is, if there were a world that contained electrons, some of which exist in @ and some of which don't, it would be arbitrary to think that the world could only be contracted down to

with it. We previously saw that Speaks view might accommodate the claim <possibly, Socrates does not exist>—for propositions like ∼ S are incompatible with Socrates existence, despite not directly referring to Socrates. But notice that ∼ S only manages to do so because it directly refers to all the individuals that would exist if it were true. A lonely alien electron world, on the other hand, poses a problem because, given Existentialism, no proposition directly refers to the lonely alien electron. That's the issue in short.

To present the problem more precisely, I will assume that possible worlds are propositions. (I think it will be obvious how the argument can be restated if one instead treats them as states of affairs, sets of propositions or properties—see also footnote 10.) The argument hinges on the following property

(LEP) being such that, were it true, there would be a lonely electron & no electron that exists in @ would exist.

The problem can be stated like this:

The Lonely Alien Problem

(4) If <there's a lonely alien electron> is possible, then <there's a lonely alien electron> is true at a possible world.
(5) If <there's a lonely alien electron> is true at a possible world, then there is a possible world that has the property <being such that, were it actual, there would be an alien electron>.
(6) If there is a possible world that has the property <being such that, were it actual, there would be a lonely alien electron>, then there is a possibly true proposition that instantiates LEP.
(7) No possibly true proposition instantiates LEP.
(8) Therefore, a lonely alien electron isn't possible.

Premise (4) simply follows from the analysis of possibility in terms of truth at a possible world. This also captures those propositions that are true *in* possible worlds; if a proposition is true *in* world W, then it's also true *at* W. Premise (5) follows directly from Speaks' analysis of truth at a world: <there's a lonely alien electron> is true at W if and only if W instantiates <being such that, were it actual, there would be an alien electron>. But we should notice that (5) has general appeal; even for those who analyze 'truth at' a world differently than Speaks, they should still take (5) as true—that is, even if the consequent isn't thought as an *analysis* of the antecedent, it's nevertheless a *necessary condition* for the antecedent.[9]

Premise (6) is a bit more complicated. But we can break down the reasoning behind it in two steps. First, we should notice that any lonely alien electron world [that is,

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Footnote 8 continued

one of the former electrons. Hence, Loneliness is true since the possibility of loneliness holds for electrons in any world. Finally, we can see that Lonely Alien follows from More Stuff and Loneliness in this way: More Stuff entails that there could have been an alien electron e and Loneliness entails e could possibly be lonely. Furthermore e would still be an *alien* if it were lonely; since aliens by definition do not, and so could not, exist in @. Therefore, it's possible that there be an electron that is both lonely and alien.

[9] This won't hold, of course, if one doesn't believe in the existence of such properties. If so, the argument still should work when talk of properties is paraphrased in other plausible terms.

any world that satisfies the antecedent of (6)] is also a world in which no electron that exists in @ exists. This just follows from the 'alienhood' of the electron. So it should be evident that the antecedent of of (6) gets us to the claim:

> (P) there is a possible world that instantiates <being such that, were it actual, there would be a lonely electron & no electron that exists in @ would exist>.

The second step is to show that P gets us to the consequent of (6). To do so we need these three assumptions: (i) possible worlds are possibly actual, (ii) possible worlds are propositions and (iii) a proposition's possible actuality requires that the proposition be possibly true. Claim (i) is a widespread assumption—though we will see in Sect. 5.2 that this is the very claim that I suggest we reject. I also assume claim (ii) for the sake of simplicity.[10] And claim (iii) naturally accompanies the first two assumptions—(i) and (ii) imply that possible worlds are propositions that are possibly actual, but how could a proposition be actual yet not true? With assumptions (i)–(iii) in place, we can replace the claim that 'there is a possible world that instantiates…' with the claim 'there is a possibly true proposition that instantiates…' (that is, the latter claim will be entailed by the former) . And with (iii), we can replace the occurrence of 'were it actual' in P with 'were it true'. This gets us the claim: there is a possibly true proposition that instantiates <being such that, were it true, there would be a lonely electron & no electron that exists in @ would exist>. And that claim is just the consequent of (6).

One might object to this support for (6) by saying that a possible world *W* in which Ed or Edna don't exist can't instantiate any properties that directly refer to @ (such as LEP); this is because @ wouldn't exist to be referred to (since @ directly refers to Ed and Edna). But this objection is mistaken. *W actually* instantiates all sorts of properties that directly refer to @, such as <being such that @ exists>, <being such that @ is a world >, etc. But *W would not* instantiate these properties if it were actual. (We previously saw Speaks makes this sort of point as well.) Likewise, *W does* instantiate LEP, but *wouldn't* if *W* were actual.

As for premise (7), we might begin to see the motivation for it by looking at particular examples. Let's start with the proposition

> (L1) there is a lonely electron.

Does this proposition instantiate LEP? That is, if it were true, would there be a lonely electron that isn't identical to Ed? I think this clearly is not the case. All (or at least some) of the closest worlds in which L1 is true are also worlds where electron propositions true in @ are true. For instance, a world in which Ed is a lonely electron.[11]

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[10] If we conceived of possible worlds differently, we could restate the "there is a possibly true proposition" part of (6) differently. If possible worlds are properties, then restate it as "there is a possibly instantiated property". If they are states of affairs, then restate it as "there is a possibly obtaining state of affairs", etc. LEP could similarly be restated.

[11] We might notice a connection here with haecceitism—the thesis that qualitatively indistinguishable worlds can different non-qualitatively. The argument against thinking L1 instantiates LEP arises from the idea that even if there's a lonely alien world, there should also be a lonely *Ed* world—hence we are entertaining haecceitism. I think haecceitism is true [see Chisholm (1967) and fn. 6]. But I will simply adopt a more modest attitude: we at least want our modal theory to be *compatible* with haecceitism. (Those who believe in haecceitism or the more modest attitude include Adams (1981), Skyrms (1981), Fitch (1996),

Since a lonely Ed world is among the closest worlds in which there's a lonely electron, L1 doesn't instantiate LEP.

So it looks like we need to "add" something to L1 to get the right proposition. We might try

   (L2) there is a lonely electron and the lonely electron is *e*

where '*e*' directly refers to an alien electron. The truth of such a proposition would ensure that there's a lonely alien electron. However, L2 won't do either. On Existentialism, there are no propositions that directly refer to alien electrons. For if there were, there would be a proposition directly referring to an entity without the entity being in existence, *contra* Existentialism.

Let's instead try

   (L3) there is a lonely electron & the lonely electron is not Ed, Edna, ….

where 'Ed, Edna, ….' names all of the electrons that exist in the actual world. This won't do either because it isn't possibly true—if it were true, then it would exist (by Serious Actualism) and directly refer to Ed even though Ed wouldn't exist, *contra* Existentialism. We might instead suggest

   (L4) there is a lonely electron & the electron isn't identical to anything in @

where '@' names the actual world. This proposition does no better than the last. Even though L4 doesn't directly refer to an actual electron, it is still linked by a 'chain of direct reference' to an actual electron—L4 directly refers to @ and @ itself directly refers to Ed. We therefore get the same sort of problem as in L3: if L4 were true, L4 would exist (by Serious Actualism) and directly refer to @. Existentialism therefore requires that @ would exist. Yet we would still get a violation of Existentialism since @ would directly refer to Ed even though Ed wouldn't exist. The failure of L4 also shows us why "there is a lonely alien electron" can't be what we're looking for—that claim is analyzed in terms of L4.

From this survey, I think it's clear that the prospects of finding a proposition that is both possibly true and instantiates LEP is rather bleak. But we might put the point even stronger by dividing propositions into four types: (A) those that directly refer to an alien electron, (B) those that directly refer to an actual electron, (C) those that are linked by a chain of direct reference to an actual electron and (D) those that don't directly refer (nor are linked by a chain of direct reference) to any actual or alien electrons. There can be no type (A) propositions; otherwise there would be a violation

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Footnote 11 continued

Sider (2002), Fine (2005), Turner (2005) and Stalnaker (2012). And Lewis (1986), Melia (2001) and Brogaard (2006) have a similar attitude with respect to a sort of haecceitism about properties.) Boyce (2014), however, has argued that Existentialism *entails* the denial of haecceitism. His argument involves the claim that Existentialists should believe that all possible worlds are necessary existents. This is an odd claim to straddle Existentialism with since Existentialists usually explicitly believe the opposite. But Boyce argues that none of the reasons Existentialists give for it are definitive. I'm skeptical of his arguments that there is no such incompatibility. But let's suppose that Boyce is right that if Existentialism and the necessary existence of possible worlds are both true then haecceitism is false. In my mind, the lesson to take *is not* that since possible worlds are necessary existents, haecceitism is false. Rather the lesson seems to be this: since we shouldn't rule out haecceitism, we shouldn't assume the necessary existence of possible worlds.

of Existentialism. Type (B) and (C) propositions that instantiate LEP—such as L3 and L4 respectively—aren't possibly true, since their possible truth would require a possible violation of Existentialism. And any type (D) proposition that entails that there is a lonely electron—such as L1—fails to entail that the electron is an *alien*, since some of the closest worlds in which L1 are true are worlds where Ed is an electron. If this is all true and propositions must be one of types (A)-(D), then we can conclude that there is no possibly true proposition that instantiates LEP. Hence premise (7) is true. This completes the initial defense of the argument.

4 Responses

One might try to deny (7) like this: there's a possible world W that instantiates <being such that, were it actual, there would be a lonely alien electron>; and since W is a possibly true proposition that instantiates LEP, (7) is false. The problem with this reply is that it fails to show what is wrong with the argument I presented for the truth of (7). If W exists, is it a type A, B, C or D proposition? And once we've identified its type, why doesn't it suffer from the objection I presented to that type? More needs to be said to have a successful and convincing reply.

Robert Adams' analysis of 'truth at a world' might seem to give us a better way of denying (7). As Adams says, "a world-story that includes no singular proposition about me constitutes and describes a possible world in which I would not exist. It represents my possible non-existence, not by including the proposition that I do not exist but simply by omitting me." (1981: p. 22) (Adams prefers to us the term 'world-story' over possible worlds, partly because such things are referentially restricted.) Thus Adams gives us the following sufficiency condition for truth at a world:

(C_A) for any object x and world-story w, if w fails to directly refer to x, then a proposition saying that x doesn't exist is true at w.

This seems like a promising way to respond to the Lonely Alien problem since we can point out that there is a world-story that instantiates these two properties:

(LE) being such that, were it actual, there would be a lonely electron, and
($\sim$ E) failing to directly refer to any actual electrons.

Principle C_A therefore tells us that <Ed doesn't exist> is true at such a world since the world instantiates $\sim$ E. And the non-existence of any actual electron at the world can likewise be derived. Hence it follows that the lonely electron is an *alien* electron. We therefore have a denial of premise (7): a world-story instantiating LE and $\sim$ E is a possibly true proposition[12] such that, were it true, there would be a lonely electron and Ed wouldn't exist (nor would Edna, etc.).

But this objection does no better than the first objection presented. It too fails to directly address the argument I presented in defense of (7). It fails to answer the question: is the world-story a type A, B, C or D proposition and how do we address

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[12] Adams (1981) actually conceives of possible worlds as sets of propositions. I will ignore this complication in the main body. But it should be clear that what I say can be reformulated in terms of sets of propositions (see fn. 10).

the objection to the type we classify it as? But perhaps we can try and formulate an answer on the basis of Adams' insight. Supposedly a world-story instantiating LE and $\sim$ E is a type D proposition; that is, it doesn't directly refer to Ed, Edna, etc., nor does it directly refer to @, which in turn directly refers to Ed, Edna, etc. Now my objection to type D propositions that imply that there is a lonely electron was that they don't instantiate LEP, since some of the closest worlds at which such propositions are true are ones where Ed (or some other electron that exists at @) is the lonely electron. For example, one of the closest worlds in which the type D proposition <there is a lonely electron> is true is also one where <Ed is an electron> is true, hence it's not true that if <there is a lonely electron> were true, then Ed wouldn't exist. We might reply that type D propositions *that are worlds* (and instantiate LE and $\sim$ E) are indeed incompatible with <Ed is an electron>. But how is <there is a lonely electron> relevantly different from type D *worlds*? Why is the former compatible with <Ed is an electron> but the latter are not? We might point out that worlds are 'qualitatively maximal' and <there is a lonely electron> is not. For example, <there is a lonely electron> fails to tell us what laws of nature or principles of mathematics hold. But I think it's clear that this is not a *relevant* difference. There's no reason to think that if a proposition that tells us that there's a lonely electron *and* tells us what laws of nature and principles of mathematics hold were true, that Ed wouldn't exist (even though some electron would exist). So there doesn't seem to be any relevant difference between type D worlds and <there is a lonely electron> that would make the former but not the latter incompatible with Ed's existence.[13]

One straightforward way to respond to my objection is simply to deny that there are any worlds in which Ed (or any other actual electron) is a lonely electron. It then follows that <there is a lonely electron> *is* incompatible with Ed's existence. But I take such a denial to be as costly as (if not more than) the denial that there could exist a lonely alien electron.[14]

A different way to approach the problem is to notice that it bears a resemblance to a well-known issue concerning iterated modal claims about aliens. Thus it might seem promising to apply the solutions to the latter to the former as well. The issue that I have in mind is often presented[15] along the following lines:

(Swapping Aliens) there are two worlds W_A and W_B that differ only in the interchange of two aliens.

Suppose that the aliens in question are electrons. Take the conjunction of properties P_1 that electron e_1 instantiates in W_A and the conjunction P_2 that e_2 instantiates in that same world.[16] Swapping Aliens tells us that W_B only differs from W_A by having e_2 instantiate P_1 and having e_1 instantiate P_2; intuitively put, W_A and W_B look

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[13] Turner (2005) gives an analysis of what he calls "world descriptions" (which are type D propositions) and gives a principle similar to Adams' C_A. But like Adams' account, Turner's doesn't tell us how a type D proposition that entails that there's a lonely electron could rule out Ed as being the electron.

[14] See also footnote 8.

[15] See Skyrms (1981), Adams (1981), Lewis (1986), Fitch (1996), Sider (2002), Fine (2005) and Turner (2005). McMichael (1983) also presents a version of the problem in terms of a *single* alien individual and the properties it has in two distinct possible worlds.

[16] P_1 and P_2 shouldn't include properties such as <being identical to e_1>.

exactly the same, the only difference concerns which electrons are e_1 and e_2. The problem is suppose to be that certain modal views—for instance, what Lewis (1986) calls 'linguistic ersatzism'—can't recognize the existence of *two distinct* worlds here. Whatever actual object W_A is identified with, so is W_B since they only differ in terms of singular propositions that don't actually exist.

There has, however, been a fairly popular reply to the objection. Adams (1981: p. 21), G.W. Fitch (1996: p. 60), Karen Bennett (2005: p. 317), Jason Turner (2005: p. 197) and Stalnaker (2012)[17] think it's not such a cost to deny Swapping Aliens (or its variations). For one can deny it while still accepting the claim <possibly, there exist two alien electrons that could swap properties>. This proposition does require that, if the aliens were to exist, there *would* be two distinct worlds between which the two aliens swap properties. But, so they argue, the proposition doesn't require the stronger claim that there *actually be* such distinct worlds. Call this the 'Standard Response'.

I think the Standard Response is very compelling in the face of the Swapping Aliens objection. And Speaks suggests this reply as well (2012: p. 531). But the point of importance is that it doesn't help us avoid the Lonely Alien Problem. To see why, we might try to apply it by saying: 'if there *were* a lonely alien electron, then there *would be* propositions directly referring to the alien electron.' But how does this help? We might point out that if L1—the proposition <there is a lonely electron>—were true, there *would* be a proposition of the form 'the electron is e' where 'e' would directly refer to an alien electron; hence L1 is a possibly true (type D) proposition that instantiates LEP after all. But the problem with this response is: just as the truth of L1 doesn't ensure that the electron would be an alien (the electron could be Ed), so the truth of L1 doesn't ensure that there is a proposition directly referring to an alien electron (if Ed were the electron, the proposition would directly refer to Ed instead). So the problem that arises at the level of what *individual* would exist arises also at the level of what *proposition* would exist.[18]

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[17] Stalnaker (2012: p. 32) does, however, include a logical space composed of points that represent every possible world that does and *could* exist. In this sense, he could be thought to be agreeing with Swapping Aliens. Nevertheless he uses a 'factoring out' method that retains a realist modal semantics (ibid.: 33–5). He also provides a more direct method that doesn't require the introduction and subsequent factoring out of the artificial representations (ibid.: 139–48).

[18] Alternatively we might say that there's a type D proposition p that has the property: <being such that, were it true, it *would* directly refer to an alien electron and would say of it that it's a lonely electron>. Thus, even though p doesn't directly refer to any alien or actual electrons (nor is linked by a chain of direct reference to any), the truth of p would nevertheless ensure that <Ed is an electron> would not be true. Thus we have a response to the challenge I posed to thinking that type D propositions don't instantiate LEP. I agree that if there's a type D proposition that instantiates <being such that, were it true, it would directly refer to an alien electron and would say of it that it's a lonely electron>, then we have a successful reply to my challenge. But, for reasons of parity, I don't think that Existentialists should want to adopt this response. Existentialism tells us that if proposition p directly refers to x, then p couldn't exist unless x also exists. In other words: propositions can't lose what they directly refer to. But the current suggestion tells us that there are propositions that can add to what they direct refer to. That is: if $x_1 \ldots x_n$ are all the things proposition p directly refers to, it's possible that p directly refers to something other than $x_1 \ldots x_n$. And even if it's formally consistent with Existentialism to hold this suggestion, it seems *ad hoc*. Why should propositions be unable to *lose* what they directly refer to, yet be able to *add* to it? After all, part of the motivation for Existentialism is that, "[the direct reference] relation is surely part of what makes the proposition what it is; it is essential to the proposition." (Adams 1981: p. 12) So shouldn't we also think that it's also essential

There are, however, more drastic responses to the Swapping Alien problem that manage to avoid the Lonely Alien Problem. For example, Rosen (1990) has suggested a fictionalist analysis of possibility and Nolan (2002) and Sider (2002) have suggested holistic ones. These approaches allow one to deny premise (4) since they deny the existence of possible worlds altogether. For those willing to adopt one of these alternative approaches, it's still interesting to find out that there's an alien problem—i.e. the Lonely Alien Problem—that can't be solved using the Standard Response, but that requires one of these more drastic measures. But many will not be satisfied with fictionalism or holism (see, for example, Brogaard (2006) and Nolan (1997, 2016) for objections). Alternatively, one might find the Lonely Alien Problem reason to reject one of the main operating assumptions—Existentialism, Serious Actualism or the thought that electrons contingently exist. But short of this, I think that the Existentialist could respond by adopting the existence of referentially unrestricted worlds—the existence of which comes with little to no cost for the Existentialist. To this option we now turn.

5 Referentially unrestricted worlds

5.1 Some restrictions of referentially unrestricted worlds

I suggest that Existentialists seeking to analyze 'truth at' a world accept

   (RUP) there are referentially unrestricted possible worlds.

By doing so, Existentialists will have the resources to give a satisfying reply to the Lonely Alien Problem. I can only spell out the response in detail once we have a more complete account that incorporates RUP. But the intuitive idea is this: since there are referentially unrestricted possible worlds, there is a world W in which there's a lonely electron that says Ed and all the other actual electrons aren't the lonely electron in question (like proposition L3). Therefore, W tells us that there's a lonely alien electron.

   Incorporating referentially unrestricted worlds, however, places two important restrictions on a modal theory. First,

   (R1) not all possible worlds are possibly actual.

This is because, if a referentially unrestricted world were actual, its actuality would require that the world would directly refer to a non-existent object *contra* Existentialism. (R1 also requires that, if possible worlds are propositions, that not all possible worlds are possibly *true*; if they are properties, that not all possible worlds are possibly *instantiated*; etc.) Second, this also requires that

   (R2) the truth in/at distinction is not analyzed in terms of a world's actuality.

Since the actuality of referentially unrestricted worlds entails the falsity of Existentialism, the analysis of truth in or at such a world in terms of its actuality will inevitably

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Footnote 18 continued

to the proposition that it *only* directly refer to those things? [Furthermore, the objection would turn out formally inconsistent with Existentialism if the accessibility relation between possible worlds is symmetric as Turner (2005), Speaks (2012) and Boyce (2014) claim].

lead to the falsity of Existentialism being true in or at the world—hence the need for R2.

For those who analyze truth at a world, it is commonplace to either deny RUP, R1 or R2. As we've seen in Sect. 4, Adams denies RUP (though his possible worlds are called "world-stories"). We've also seen that Speaks violates R2 by analyzing '<Socrates does not exist> is true at *W*' in terms of *W* having the property <being such that, were it actual, Socrates would not exist>.

But others also violate these principles. Jason Turner violates R2 by analyzing truth in a world as: "if *p* is a proposition and *W* a possible world, *p* is true in *W* if and only if, were *W* actual, *p* would be true." (2005: p. 191) Consequently, Turner can't accept RUP: if *W* is a referentially unrestricted possible world, then if *W* were actual, *W* would directly refer to a non-existent object; hence, were *W* actual, <Existentialism is false> would be true. It therefore follows from Turner's analysis that <Existentialism is false> is true in a possible world—*contra* the necessity of Existentialism. Jeff King doesn't violate R2 specifically. This is partially because he doesn't talk of propositions being *true in* worlds. Nonetheless, he does talk of how things are "according to" worlds, a notion that he spells out like this: "consider worlds according to which bachelors exist. This means that if these worlds/properties had been instantiated—one of them is—bachelors would have existed." (2007b: p. 447) So King's possible worlds must not be referentially unrestricted: if one were actual, Existentialism would be false—hence Existentialism would be false according to a possible world. It's also commonplace to violate R1. For example, King (2007a: p. 82) says "worlds are maximal properties that the world might have had". And Robert Stalnaker (2012: p. 8) says "first, a possible world is the kind of thing that is, or can be, instantiated or exemplified."

So Existentialists that analyze 'truth at a world' often have views that are inconsistent with the existence of referentially unrestricted worlds. One might have the impression that this is because Existentialism is *incompatible* with referentially unrestricted possible worlds. But I think such an impression is mistaken. In what follows, I will show one way of analyzing possible worlds and the truth in/at distinction without violating RUP. To this task I will draw heavily from Stalnaker's work.

5.2 Unrestricted Stalnakerianism

In his (2010: p. 27) account, Stalnaker starts with a primitive entailment relation. From this he gives the following analyses:

p is true *at W* if and only if *W* entails *p*
p is true *in W* if and only if *W* entails < *p* is true>.

This account satisfies R2 since neither analysis depends on how things would be *were W actual*. Notice that if this equivalence held:

(EE) *p* entails *q* if and only if, necessarily, if *p* is true, then *q* is true.

then we couldn't have referentially unrestricted worlds. This is because we would get the falsity of Existentialism in a possible world (by the sort of reasoning given in Sect. 5.1). But since Stalnaker denies this equivalence, the issue does not arise.

With this primitive entailment relation, we can also define a possible world as a maximal consistent proposition. Here a proposition is *maximal* if and only if, for any proposition q, either p entails q or p entails the contradictory of q. And a proposition p is *consistent* if and only if, for any proposition q, if p entails q, then p does not entail the contradictory of q.[19]

The above analyses of the truth in/at distinction and possible worlds are consistent with RUP. But we should notice that even though they're so consistent, nothing in the account explicitly tells us that RUP *is* true. Nonetheless, we can fortify the above analyses with RUP to get a sort of "Unrestricted Stalnakerianism". (So named because of its basis in Stalnaker's account, not because Stalnaker agrees with it—as we saw, his claim that possible worlds can be instantiated is incompatible with RUP.)

With RUP in hand we can avoid the Lonely Alien Problem. To do so, begin by noticing that

(L3) there is a lonely electron & the lonely electron is not Ed, Edna, …,

where '…' names all of the actual electrons, *entails* that there is a lonely alien electron. (And, remember, we are denying EE. So to say that "L3 entails that there is a lonely alien electron" is not equivalent to: if L3 were true, then there would be a lonely alien electron. For otherwise, L3 would also entail the falsity of Existentialism: if L3 were true, Existentialism would be false.) And given that we can identify a proposition that entails the existence of a lonely alien electron, there is no bar to thinking that there's a *possible world* that entails that there's a lonely alien electron. (L3 itself isn't a possible world since it isn't maximal.) Hence we can hold that it's possible for there to be a lonely alien electron since <there is a lonely alien electron> is true at some possible world.

Given all this, the Unrestricted Stalnakerian can deny

(6) If there is a possible world that has the property <being such that, were it actual, there would be a lonely alien electron>, then there is a possibly true proposition that instantiates LEP.

This might seem like an odd premise to deny. After all, I have been arguing that any possible world W that entails that there is a lonely alien electron isn't possibly actual. Doesn't it follow from this that W does *not* have the property <being such that, were it actual, there would be a lonely alien electron>? But if so, then we can't affirm the antecedent of (6)—hence we can't deny (6). But this is mistaken. I *do* hold that W isn't possibly actual, but this is compatible with W having the property in question. The property would just be a counter-possible property—one that states what happens if the impossible happened. [Anyone who disagrees with me on this point can instead take Unrestricted Stalnakerianism to deny (5).] Thus, we can deny (6): W has the property <being such that, were it actual, there would be a lonely alien electron>, yet W isn't a possibly true proposition that instantiates LEP. And this is just because W isn't possibly true.

I've argued that a benefit of Unrestricted Stalnakerianism is that it avoids the Lonely Alien Problem. But perhaps there are costs that outweigh this benefit. To begin with,

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[19] This is essentially the same definition Stalnaker (2012: p. 49) discusses.

does it really make sense to admit that some possible worlds aren't possibly *actual*? Don't we need them to all be possibly actual? I don't see that we do. Stalnaker has already analyzed possible worlds, truth in and truth at a world without appeal to the possible actuality of worlds. So what need is there for such possible actuality? Granted, we need the actual world to be possibly actual—simply because it *actually is* actual. But there seems to be no need to think that *all* possible worlds must be.

Perhaps Stalnaker's denial of EE is more problematic. By denying it, we must also reject instances of Tarski's truth-schema such as the necessity of

(T) Socrates does not exist if and only if <Socrates does not exist> is true.

This is because even though some possible world W entails <Socrates does not exist>, W doesn't entail that <Socrates does not exist> is true. And isn't the rejection of T a heavy price to pay? Perhaps it is, but I don't see that it's a cost that's unique to Stalnaker's account. Existentialist views where all possible worlds are referentially restricted seem to carry the same commitment—they believe that there are worlds where Socrates doesn't exist even though there are no propositions in those worlds that directly refer to Socrates. [Speaks (2012: p. 556) explicitly accepts it as a cost of his view.] One might reply that defenders of referentially restricted worlds can hold that, for any world in which Socrates doesn't exist, the proposition <Socrates doesn't exist> is still true *in some sense* in the world: it's still true *at* that world. But this response fails since it doesn't show that such accounts preserve the truth of T in particular. At most this tell us that referentially restricted views can preserve a formally similar principle:

(T-) For all worlds W, Socrates does not exist if and only if <Socrates does not exist> is true at W.

But this is no benefit over Unrestricted Stalnakeriansim. T- is true on Unrestricted Stalnakerianism as well given its analysis of truth at a world.

6 Conclusion

I have argued that accounts of the truth in/at distinction that don't allow for referentially unrestricted worlds have trouble accommodating the possibility that there is a lonely alien electron. I instead suggested that Existentialists accept the existence of referentially unrestricted worlds in order to avoid the problem. But such an acceptance involves two restrictions: first, that we not analyze truth in or at a world in terms of a possible world's actuality and, second, that we allow for possible, but not possibly actual, worlds. Unrestricted Stalnakerianism gave us one example of how we can analyze the relevant modal notions while satisfying these restrictions. But whether Unrestricted Stalnakerianism is *all things considered* better than the competing accounts is a matter to be seen. Though I have indicated that objections concerning the acceptance of possible worlds that aren't possibly actual and violations of Tarski's truth-schema aren't good reasons to reject referentially unrestricted worlds.

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