Is Evidence of Evidence Evidence?[*]

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1   Introduction

Rational subjects proportion their beliefs to the evidence. Often times, however, although the evidence that directly bears on a proposition is out of our reach, we do have information that bears on it indirectly. For example, a news item may report that a group of cancer researchers found strong evidence linking cancer and frequent cell phone use. Or perhaps you learn that an advisor you trust and consider reliable believes that the end is nigh. Upon reading such a news item, and all other things being equal, you ought to believe that cancer is correlated with cell phone use, or at least considerably increase your confidence in that proposition. Upon learning what your trusted advisor thinks, and all other things being equal, you ought to believe that the end is nigh, or at least to considerably increase your confidence in that proposition. This is so despite the fact that you do not know what the evidence linking cancer to frequent cell phone use is, and you do not know why your trusted advisor believes that the end is nigh. If we want to combine the judgments about these cases with the principle that we should proportion belief to the evidence, then we are well on our way to arguing for the claim that evidence of evidence is evidence (EEE).

Whether EEE is true has important consequences for the debate on the epistemological significance of disagreement. Richard Feldman (2007) makes this point as follows:

> Even if it is true that the theists and the atheists have private evidence, this does not get us out of the problem. Each may have his or her own special insight or sense of obviousness. But each knows about the other's insight. Each knows that this insight has evidential force. And now I see no basis for either of them justifying his own

> belief simply because the one insight happens to occur inside of him. A point about evidence that plays a role here is this: evidence of evidence is evidence. More carefully, evidence that there is evidence for P is evidence for P. Knowing that the other has an insight provides each of them with evidence. (p. 208)

In other words, learning that a peer has some incommunicable evidence that *p* should make one less comfortable with one's position that *not-p*, and this can be explained by EEE.

Whether EEE is true has bearing on other epistemological issues as well. For instance, Roger White (2006) relies on a similar principle when discussing an objection to Dogmatism:

> If we are now justified in believing that we will soon be justified in believing [that this is not a super-fake hand], then surely we are already justified in believing it. We shouldn't have to wait around to gain this new justification that we know is coming our way, in order to justifiably go ahead and believe it. In this last move, I am appealing to a principle that I have heard captured in the slogan `evidence of evidence is evidence.' (p. 538)

Moreover, as White notes, EEE is related to van-Frassen's Reflection Principle (1984), according to which one must treat one's future self as an expert.

Other authors (such as Comesaña (2013)) have argued that EEE bears on the plausibility of different *pragmatic encroachment* views. For instance, it has been argued that if EEE is true, then views that take the amount of evidence necessary for knowledge as dependent on one's stakes collapse into views according to which how much evidence one has depends on one's stakes. So quite a bit rides on whether EEE is true and what exactly it says.

In what follows we examine whether EEE is true. We distinguish several different versions of the principle and examine recent attacks on some of those versions. We argue that, whatever the merits of those attacks, they leave the more important rendition of the principle untouched. That version is, however, also subject to new kinds of counterexamples. We end by suggesting how to formulate a better version of the principle that takes into account those new counterexamples.

2   Disambiguating EEE

As will become evident, there are a number of ambiguities in the formulations of EEE principles. In order to sort the different meanings, we need a way to symbolize the logical form of statements to the effect that there is evidence for this or that proposition. In this section we provide that formalization.[1] We also present some of the assumptions that we will be relying on.

We will assume that evidential relations hold between propositions. We will use lower-case roman letters, such as 'e' and 'p' as propositional variables. The relationship of 'being evidence for' comes in degrees. It can also have different valences. Thus, not only can some proposition e be evidence for some other proposition p to a greater degree than it is evidence for a third proposition q, but it may also be no evidence whatsoever for a fourth proposition r, and it may be counter-evidence for yet another proposition s. We will use lower-case Greek letters as variables for the degree (positive or negative) to which a proposition provides evidence for another. The evidential relation is, moreover, not a two-place relation between two propositions, but a three-place relation between two propositions and some assumed evidential corpus. Thus, that John says that it is raining may be evidence that it is raining relative to one evidential background and evidence that it is not raining relative to a different background (one according to which John always lies, for example). In what follows we omit this third relatum to simplify exposition, but it is important to keep it in mind.

Our fundamental notion will be that of some proposition providing evidence for another to a certain degree. We will formalize a claim of that form as follows: $F(e, p, \alpha)$. Notice that this claim says that e is evidence for p to degree α—it is an open sentence with three free variables, which is therefore neither true nor false. How can we express the (true) proposition that there are evidential relations, that some propositions are evidence for others? Like this:

> (Some propositions are evidence for others): $\exists(e)\exists(p)\exists(\alpha > 0)(F(e,p,\alpha))$

How can we formalize the open sentence, 'There is evidence for p'? The English phrase might well be ambiguous. In one disambiguation (although not the one we intend—hence the asterisk), it can be formalized as follows:

(*There is evidence for p): $\exists(e)\exists(\alpha > 0)(F(e,p,\alpha))$

But '$\exists(e)\exists(\alpha > 0)(F(e,p,\alpha))$' says that there is a proposition that stands in the evidential relation to *p*. That open sentence is satisfied, for instance, by the proposition that there is a teapot orbiting the sun, because there are propositions which stand in the evidential relation to the proposition (for instance, the proposition that most stars have teapots orbiting them). So 'There is evidence for *p*' can mean that there is a (possibly false) proposition that supports *p*. However, 'There is evidence for p', can mean (and it probably usually means) that there is a *true* proposition which supports *p*. The correct formalization of that sentence is the following (where 'T(e)' means that *e* is true):

(There is evidence for p): $\exists(e)\exists(\alpha > 0)(T(e) \wedge F(e,p,\alpha))$

From here on, when we say that there is evidence for *p*, we mean it in the sense just formalized.

Obviously, a crucial notion in discussing EEE is that of something being evidence of evidence. The ambiguity just discussed in 'There is evidence for *p*' arises twice in the phrase '*e* is evidence of evidence for *p*'. Thus, there is a difference between saying that *e* is evidence that there is a (possibly false) proposition *e'* which stands in the evidential support relation to *p*, and saying that *e* is evidence that *e'* is true and supports *p*. As Feldman (2014) notes, it is the latter notion that is relevant to the discussion of EEE principles: that *e* is evidence that there is an evidential relation between the proposition *e'* and the proposition *p* is not even a prima facie good candidate for thinking that *e* is evidence for *p*.[2]

Still, even if we specify that we understand the above phrases to refer to true propositions, there is yet a further ambiguity in the phrase '*e* is evidence that there is evidence for p'. It is a *de re/de dicto* ambiguity. Just as there is a difference between believing that a specific person is a spy and believing the existential proposition that there are spies, there is an analogous difference between *e* being evidence for a specific proposition which is evidence for *p*, and *e* being evidence for the existential proposition that there is evidence for *p*:

(e is evidence that there is *de re* evidence for p): $\exists(e')\exists(\alpha > 0)\exists(\beta > 0)(F(e,e',\alpha) \wedge F(e',p,\beta))$[3]

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[2] Feldman (2014), p. 291.

[3] In this formalization we appeal to the T-Schema: T(e') ↔ e'. In particular, we assume that *e* is evidence for *p* if and only if *e* is evidence that *p* is true.

> (e is evidence that there is *de dicto* evidence for p): ∃(α > 0)∃(β > 0)(F(e,∃(e')(T(e') ∧ F(e',p,α)),β)[4]

We understand now what we mean when we say that *e* is evidence that there is evidence (whether *de dicto* or *de re*) for *p*. But what do we mean when we say that *e* is evidence that somebody *has* evidence for *p*? There are different theories about evidence possession. Some think that all it takes for a proposition to be part of a subject's evidence is that the subject believes the proposition (see Schroeder (2011) and Thomson (2008)). Others think that the proposition must be known (see Williamson (2000)). Yet others believe that it has to be justifiably believed (see Comesaña and McGrath (2014) and Comesaña and McGrath (forthcoming)). We will assume here that someone has a proposition as evidence only if that proposition is true. We make this assumption not because we think it is particularly plausible, but because the issues surrounding the interpretation of evidence-possession are orthogonal to the issues discussed here, and the assumption makes for the most charitable interpretation of some of the principles in question. To make the factivity transparent, we will symbolize that subject S has evidence *e* with 'T(e) ∧ S(e)'. We have, then, both a *de re* and a *de dicto* interpretation of 'e is evidence that S has evidence for p':

> (e is evidence that S has *de re* evidence for p): ∃(e')∃(α > 0)∃(β > 0)(F(e,e' ∧ S(e'), α) ∧ F(e',p,β))

> (e is evidence that S has *de dicto* evidence for p): ∃(α > 0)∃(β > 0)(F(e,∃(e')(T(e') ∧ S(e') ∧ F(e',p,α)),β))

3 Three EEEs

In a recent paper, Branden Fitelson (2012) considers three renditions of the EEE principle—including Richard Feldman's preferred formulation—and ends up rejecting them all as plausible candidates of EEE. We follow Fitelson in calling these EEE1, EEE2 and EEE3:

> (EEE1) If *E* (non-conclusively) supports the claim that (some subject) *S* possesses evidence which supports *p*, then *E* supports

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[4] Here we cannot appeal to the T-schema and write instead '∃(α > 0)∃(β > 0)(F(e,∃(e')(e' ∧ F(e',p,α)), β))'. That is simply not a well-formed sentence, in the same way in which the following isn't: ∃(x)(x ∧ G(x)).

p.

(EEE2) If *E1* supports the claim that *S* possesses evidence *E2* which supports *p*, then the conjunction *E1* ∧ *E2* supports *p*.

(EEE3) If *S1* possesses evidence (*E1*) which supports the claim that *S2* possesses evidence (*E2*) which supports *p*, then S1 possesses evidence (E3) which supports p.

Having been convinced by Fitelson that EEE1 won't work, Feldman (2014) offers EEE3 as his latest formulation of the principle. In his paper, however, Fitelson tries to show that EEE3 will not do either. He begins by presenting a counterexample to EEE1. After considering (and rejecting) moving from EEE1 to EEE2, he goes on to argue that the counterexample to EEE1 can be made to work against EEE3 as well.

However, William Roche (2014) points out an ambiguity in these formulations. As we have put it, they can be interpreted *de dicto* or *de re*. Roche argues that Fitelson's case works only against the *de re* interpretation and not against the *de dicto* one. Roche then goes on to argue that a modification of Fitelson's case does work against the *de dicto* version. In this section we argue that although Roche's reasons for thinking that Fitelson's case is not a counterexample to the *de dicto* version of EEE are misguided, it is nevertheless true that Fitelson's case is not a counterexample to that version, whereas Roche's modified case is. But in the next section we argue for a modification of the *de dicto* interpretation of EEE which makes the principle immune to Roche's case.

It is well known that the relationship of probability-raising is not transitive. That is to say, it is sometimes the case that $P(q|p) > P(q)$ and that $P(r|q) > P(r)$ without it being the case that $P(r|p) > P(r)$.[5] Some think that the evidential relation must be understood probabilistically, that is to say, that $F(e,p,\alpha > 0)$ is to be understood as $P(p|e) > P(p)$, where 'P' characterizes the credence function of the relevant subject—or perhaps it characterizes an *evidential probability* function (roughly, the credence function the relevant subject ought to have). If so, then it obviously follows that the evidential relation itself is not transitive. Moreover, the failure of the transitivity of probability-raising is connected to the failure of Hempel's (1945) infamous Special Consequence Condition (where confirmation is also understood as probability-raising):

(Special Consequence Condition): If *e* confirms *p* and *p* entails *q*, then *e* confirms *q*.

The following example shows that the Special Consequence Condition is false (and also shows that probability-raising is not transitive):

E1 = Card c is black.
H = Card c is the Ace of Spades.
H' = Card c is an Ace.

E1 raises the probability of H, and H entails (and so raises the probability of) H', but E1 does not raise the probability of H'.

One need not hold that the evidential relation must be understood as the probability-raising relation to think that the evidential relation is not transitive. In general, reasons to doubt that the evidential relation can be understood probabilistically (for instance, worries about logical omniscience) do not apply to the examples that show that probability-raising is not transitive. Thus, these examples give us strong reasons to think that the evidential relation is not transitive even if we do not think that it can be understood probabilistically.

Our example against the Special Consequence Condition is a simplification of the case that Fitelson uses against EEE1 and EEE3.[6] In Fitelson's case, we assume that John has been shown a card drawn at random from a standard deck. E1, then, is evidence that there is a proposition (namely, H) such that John has H as evidence. Moreover, H is evidence for (indeed, entails) H'. And yet, E1 is not evidence for H'.

What is this case a counterexample to? It is uncontroversially a counterexample to a *de re* reading of EEE1:

(EEE1 *de re*): $\forall(e)\forall(e')\forall(p)\forall(S)\forall(\alpha > 0)\forall(\beta > 0)((F(e,e' \wedge S(e'),\alpha) \wedge F(e',p,\beta)) \rightarrow \exists(\gamma > 0)(F(e,p,\gamma)))$

There exists a proposition, namely H, such that H is evidence for H', and E1 is evidence that John has H—and yet E1 is not evidence for H'. But Roche suggests that the case is not a counterexample to EEE1 *de dicto* (our formulation, not Roche's):

(EEE1 *de dicto*): $\forall(e)\forall(p)\forall(S)\forall(\alpha > 0)\forall(\beta > 0)((F(e,\exists(e')(T(e') \wedge$

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[6] We agree with Fitelson that genuine counterexamples to EEE1, suitably modified, would work as counterexamples to EEE2, and so we ignore EEE2 in what follows.

$$S(e') \wedge F(e',p,\alpha)),\beta)) \rightarrow \exists (\gamma > 0)(F(e,p,\gamma)))^{[7]}$$

According to Roche, Fitelson's case is not a counterexample to EEE1 *de dicto* because we already know the following existential proposition: *there is some proposition that John has which is evidence for H'*. Roche's reasoning is the following: no matter what card c is, there is a proposition that John has which is evidence for H'. If c is an Ace, then the proposition is that c is an Ace, whereas if c is not an Ace but, say, a Queen, then there will still be a proposition that John has which is evidence for H' (for example, that c is not a Jack). Therefore, E1 is not evidence for us that there is a proposition that John has as evidence, which is evidence for H'—we already knew that, and there is no sense in which E1 makes us know it better given our preexisting certainty on the matter. Thus, according to Roche, the antecedent of EEE1 *de dicto* is not satisfied in Fitelson's case.[8]

However, Roche's observation does not show that Fitelson's case is not a counterexample to EEE1 *de dicto*.[9] Roche's point depends on the fact that it is relatively easy to know that somebody has evidence to some degree or other for some proposition *p*. But notice that EEE1 *de dicto* does not say that if *e* is evidence that S has evidence for *p* to some degree or other, then *e* is evidence for *p*. Rather, EEE1 *de dicto* says that, for any particular degree α, if *e* is evidence that S has evidence for *p* to *that* degree α, then *e* is evidence for *p*. That is to say, there is a version of EEE1 *de dicto* that is also *de dicto* with respect to the degrees involved. But the plausible version is the one that is *de re* with respect to degrees of support. Roche's point shows only that Fitelson's case is not a counterexample to the former, implausible, principle.

In other words, what Fitelson's case threatens to show is that *e* is evidence that John has entailing evidence for *p*, i.e., evidence to degree 1 for *p*, but *e* is not itself evidence for *p*. Roche's point, namely, that we already know that John has evidence to some degree for *p*, does nothing to repel this threat. To show this, we can note first that Roche's point can be strengthened. We know, even before learning E1, that John has evidence that raises the probability of H' to at least 4/5. For either John saw an Ace or he saw some other card. If he did see an ace, then he

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[7] Here and in what follows we assume that the proposition that there is evidence for *p* is itself evidence for *p*.

[8] Roche seems to think that the point holds only under a Williamsonian conception of evidence possession, and thus hedges by saying that Fitelson's case only *may* be a counterexample to (in effect) EEE1 *de dicto*. But Roche's point holds (if at all) on any sane conception of evidence-possession, not only a Williamsonian one.

[9] In fairness to Roche, he does not address our EEE1 *de dicto*, but a related formulation of his own.

obviously knows a proposition that raises the probability of H' to at least 4/5 (indeed, he knows a proposition that entails H'). But if John didn't see an Ace, then we know that he knows a proposition of the following form: *either c is an Ace or it is x* (where 'x' is to be replaced by the card that John saw). Of course, while we don't know exactly which proposition that is, we do know that there is some proposition of that form which John knows, and we know that a proposition of that form raises the probability of H' to 4/5. But we don't know that John knows a proposition that entails H', and that is what, according to Fitelson, E1 gives us evidence for. The strengthened version of Roche's point (namely, that we already know that John knows a proposition that raises the probability of H' to at least 4/5, and so we cannot gain evidence for that proposition) is irrelevant to Fitelson's claim that E1 gives us evidence for the proposition that John has entailing evidence for H'.

But although Roche's point does not show that Fitelson's case is not a counterexample to EEE1 *de dicto*, it is nevertheless true that Fitelson's case is not a counterexample to EEE1 *de dicto*. As we just said, the threat is that E1 is evidence for the following existential proposition: *John has as evidence a proposition which entails H'*. But this is simply false. We know that John has as evidence a proposition which entails H' if and only if John saw that *c* is an Ace. Before learning E1, we thought that the chances that John saw that *c* is an Ace were 4/52, because he could have seen any of the four Aces on the deck. After learning E1, we know that John did not see the red half of the deck. But the odds that John saw an Ace are the same as before, at 2/26. Therefore, E1 is not evidence that John has entailing evidence for *p*, and so Fitelson's case is not a counterexample to EEE1 *de dicto* after all. Notice that the fact that Fitelson's case is not a counterexample to EEE1 *de dicto* is yet another example of the failure of the Special Consequence Condition. That John has H and that H is evidence for H' entails that there is a proposition John has which is evidence for H'.[10]

So far we have argued that although Roche's point does not show that Fitelson's case is not a counterexample to (EEE1 *de dicto*), this is nevertheless true. Now, after presenting his misgivings about Fitelson's case, Roche presents a modification of it designed to fix what he sees as its problems. And although what Roche saw as a problem in Fitelson's case is not actually a problem, his modified case does succeed where Fitelson's failed.

Roche's modification is the following: Suppose that, unbeknownst to

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[10] The assumption that the relationship of evidence possession is factive is favorable to Fitelson. If it weren't, then it would be obvious that counterexamples to the *de re* version are not counterexamples to the *de dicto* version.

John, the card will be shown to him if and only if it is the Ace of Spades. In that case, not only is E1 evidence that John has H, which is entailing evidence for H' (as in Fitelson's case), but E1 is now also evidence for the existential proposition that there is a proposition that John has as evidence which is entailing evidence for H'. For on the assumption that the card is black, the odds are 1/26 that there is a proposition that John has which is entailing evidence for H', whereas in the absence of that assumption they are only 1/52. However, for the same reasons as before, E1 is not itself evidence for H'.

Does this example also show that Feldman's favorite version of the principle, EEE3, is false? No. Feldman's own reply to Fitelson is less than crystal clear[11], but there is a proposition E3 (for example, that c is not the Jack of hearts) such that E1 is evidence for us for E3, and E3 is evidence for *p*. But even though neither Fitelson's nor Roche's counterexample work against EEE3, that is no big comfort for the friend of EEE principles, for, as we now argue, EEE3 is trivial. EEE3 is trivial because, for *any* pair of propositions E1 and *p* (about which the subject is not already certain), there is another proposition entailed by E1 which supports *p*—for instance the proposition *Either E1 or p*. Therefore, there cannot be counterexamples to EEE3, but that is only because EEE3 is trivial.[12]

In this section we examined Fitelson's objections to EEE principles. We showed that although Fitelson's case works as a counterexample to EEE1 *de re*, it does not work as a counterexample to EEE1 *de dicto*. We also examined Roche's analysis of Fitelson's case, and argued that Roche misdiagnoses the failure of Fitelson's case to undermine EEE1 *de dicto*. Roche does succeed, however, in constructing a counterexample of his own to EEE1 *de dicto*. We also pointed out that although Feldman's favorite formulation of EEE is safe from counterexamples, that is only because it is trivial. We now turn to show that neither Fitelson's nor Roche's cases undermine what we consider to be the most plausible interpretation of EEE.

4   What evidence is there?

We saw that Fitelson's case is not a counterexample to the *de dicto* version of EEE because a particular proposition E can be evidence that S has as evidence another proposition H which is entailing evidence for H', but not be evidence for the existential proposition that S has entailing evidence for H'. Roche's modification of Fitelson's case is indeed a

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[11] See Feldman (2014) pp. 298-9.
[12] See Comesaña and Tal (forthcoming).

counterexample to the *de dicto* version of EEE, but we will argue now that it suffers from a similar deficiency. This deficiency makes it fail to undermine what we think is the most important version of EEE.

So far, all versions of the EEE principle that we have discussed have been formulated in terms of evidence someone has. But what about corresponding versions of those principles formulated in terms of evidence *there is*? That would give us the following results:

(Existential EEE1 *de re*): $\forall(e)\forall(e')\forall(p)\forall(S)\forall(\alpha > 0)\forall(\beta > 0)((F(e,e',\alpha) \wedge F(e',p,\beta)) \rightarrow \exists(\gamma > 0)(F(e,p,\gamma)))$

For all *e*, *e'* and *p*, if (i) *e* is evidence for *e'* and (ii) *e'* is evidence for *p*, then *e* is evidence for *p*.

(Existential EEE1 *de dicto*): $\forall(e)\forall(p)\forall(S)\forall(\alpha > 0)\forall(\beta > 0)((F(e,\exists(e')(T(e') \wedge F(e',p,\alpha)),\beta)) \rightarrow \exists(\gamma > 0)(F(e,p,\gamma)))$

For all *e* and *p*, if *e* is evidence that there is evidence *e'* for *p*, then *e* is evidence for *p*.

Perhaps surprisingly, although Fitelson's case is a counterexample to Existential EEE1 *de re*, neither Fitelson's case nor Roche's are counterexamples to Existential EEE1 *de dicto*. As we already noted, E1 is evidence for H, H is entailing evidence for H', but E1 is not evidence for H'—therefore, Existential EEE1 *de re* is false. However, although in Roche's case E1 is evidence that there is a proposition that John has and is entailing evidence for H', E1 is not evidence that there is a true proposition that is entailing evidence for H'. As we said, the probability that there is a proposition that John has as evidence and entails H' is higher on the assumption of E1 (1/26) than on the absence of that assumption (1/52). But although E1 raises the probability that John has entailing evidence for H', it doesn't raise the probability that there is entailing evidence for H'—the probability of that existential proposition is the same both before and after learning E1. For we know that there is a true proposition which entails H' if and only if *c* is one of Aces, and the unconditional probability that *c* is one of the Aces is the same as the probability of that proposition conditional on E1, namely 2/26. That Roche's case is a counterexample to EEE1 *de dicto* but not to Existential EEE1 *de dicto* is yet another counterexample to the Special Consequence Condition, for (we are assuming) that there is a proposition that *S* has which is evidence for *p* entails that there is a true proposition that is evidence for *p*.

It is Existential EEE1 *de dicto* that is the relevant version of EEE. The argument for this claim can be made in two parts. First, the relevant version of EEE is a *de dicto* rather than a *de re* version. That there is evidence for a particular proposition that is evidence for *p* can be evidence for *p* only if it is evidence that there is evidence for *p*. For instance, there is no temptation at all to think that E1 is suggestive of there being evidence for H', even though it is evidence for the card being the Ace of Spades. On the other hand, evidence that there is evidence for *p* may be sufficient for counting as evidence for *p* even if there is no proposition that is evidence for *p* which we have evidence for (as our examples from the introduction show). Second, what matters is what evidence there is rather than simply what evidence anybody has. That there is evidence that someone has evidence for *p* can only be evidence for *p* if it is evidence that there is evidence for *p*. For instance, there is no temptation at all to think that evidence that John has evidence for H' (in Roche's case) is evidence for H'. On the other hand, evidence that there is evidence for *p* may be sufficient for counting as evidence for *p* even if nobody has it (suppose, for instance, that all the researchers involved in studying whether *p* declare that they found excellent evidence for *p*, but then die before telling us what the evidence is). Therefore, what matters is whether there is evidence that there is evidence for *p*—that is to say, what matters is Existential EEE1 *de dicto*—and neither Fitelson's nor Roche's cases offer a counterexample to it.

In addition, recall that discussion of EEE principles has one of its origins in the literature on the epistemic significance of disagreement. In a usual way of framing that debate, two "epistemic peers" have the same first-order evidence but disagree on what that evidence supports. On one way of thinking about these cases, this disagreement gives each one of them evidence that the other has evidence for the negation of what they believe. But it is often stipulated that the peers do not know what this evidence is. Consideration of disagreement cases, then, is a further reason for thinking that it is a *de dicto* version of EEE which matters. Moreover, it cannot really matter whether the evidence is that some subject has evidence or that the evidence is out there. Therefore, this is a further reason for thinking that the interesting principle is Existential EEE1 *de dicto*.

Does Existential EEE1 *de dicto* have counterexamples? Unfortunately, yes. Consider, for instance, the following proposition:

H" = It rained in this place 1,000,000 years ago.

We can gain evidence that there is evidence for H", and ordinarily that

would be evidence for H", but not always. Take the following possible evidence:

E2: There is evidence for H", but H" is false.

E2 is certainly evidence that there is evidence for H"—it entails it. However, E2 is not evidence for H"—it entails that it is false. Therefore, Existential EEE1 *de dicto* is false.[13]

We can now go back and create similar counterexamples to EEE1 *de re* and EEE1 *de dicto*. For the *de dicto* version we have:

E3: S has evidence for H', but H' is false.

Just as E2 is a counterexample to Existential EEE1 *de dicto*, so too is E3 a counterexample to EEE1 *de dicto*.[14] We can use the exact same trick for EEE1 *de re*:

E4: There is an *e* such that *e* is evidence for *p*, but *not-p*.

What is common to E2, E3 and E4 is that they all say that there is evidence (whether *de dicto* or *de re*) for a certain proposition *p* and also say that *p* is false. But it is possible to generate similar counterexamples that have a somewhat different structure. For instance, consider the following:

E5: c is the Jack of Spades.

E5 entails (and so is evidence for) E1 (that c is black), and E1 is evidence for H (that c is the Ace of Spades). Yet, far from being evidence for H, E5 is conclusive evidence against it.[15] Thus, this case shows that not only is the Special Consequence Condition false, but so is the following principle, also put forward by Hempel:

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[13] Notice that the second conjunct of E2 specifies some evidence against H"–namely, *not*-H". We could have formulated the counterexample by having the second conjunct be evidence *de dicto* against H":

      E2': There is evidence for H" and there is evidence against H".

E2' does not entail that H" is false, but it is nevertheless true that it is not evidence for it.

[14] As with E2' , we could have formulated E3 so that it is evidence *de dicto* that S has evidence against H':

      E3' : S has evidence for H' and S has evidence against H'.

[15] This counterexample is similar to Fitelson's counterexample to EEE2. See Fitelson (2012), p. 87

(Converse Consequence Condition): If *e* is evidence for *p*, and *q* entails *p*, then *e* is evidence for *q*.

The Converse Consequence Condition is false because E5 is evidence for E1, H entails E1, and yet E5 is not evidence for H.

Another interesting difference between the cases from Fitelson and Roche and the ones we presented in this section is that the former are not counterexamples to versions of EEE1 according to which if *e* entails that there is evidence (whether *de dicto* or *de re*) for *p*, then *e* is evidence for *p*, whereas ours are.

The interesting EEE principle, then, is Existential EEE1 *de dicto*. Although neither Fitelson nor Roche have a counterexample to that principle, there nevertheless are counterexamples to it. These new counterexamples share an interesting structure, and cases with this structure represent new counterexamples to the previous versions of the principles. Roche himself proposed a modification of EEE principles to deal with Fitelson's and his own counterexamples. Although, as we argued in this section, we do not think that Fitelson's and Roche's cases undermine the plausible version of EEE, we consider in the next section whether Roche's suggested fix for EEE could be applied to the version of EEE we favor, thus saving it from our own counterexamples.

5   Screening-off and evidential transitivity

Building on Shogenji (2003), Roche shows that probability-raising *is* transitive if the following "screening-off" condition is satisfied:

(Y screens off X from Z): $P(Z|X \land Y) \geq P(Z|Y) \land P(Z|X \land \neg Y) \geq P(Z|\neg Y)$

Or, generalizing:

(p screens off e from q): $[F(p,q,\alpha) \rightarrow F(e \land p,q,\beta \geq \alpha)] \land [F(\neg p,q,\gamma) \rightarrow F(e \land \neg p,q,\delta \geq \gamma)]$

The screening-off condition is a conjunction. This condition says that irrespective of whether *p* is true, *e* has no negative impact on the probability of *q*.[16] Let us call its first conjunct the *positive* screening-off condition, and its second conjunct, the *negative* screening-off condition.

In Fitelson's case, although the positive screening-off condition is

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[16] Roche (2013), p. 3

satisfied, the negative screening-off condition is not: the evidential support that E1 ∧ ¬H provides to H' is less than the evidential support that ¬H by itself provides to H'—the card is more likely to be an Ace on the assumption that it is not the Ace of Spades than on the assumption that it is not the Ace of Spades and it is a black card (3/52 vs. 1/26). Therefore, Fitelson's case is not a counterexample to following fix for the *de re* version of EEE1:

(EEE1 *de re* screen off): $\forall(e)\forall(e')\forall(p)\forall(S)\forall(\alpha > 0)\forall(\beta > 0)$ $\forall(\gamma)((F(e,e' \wedge S(e'),\alpha) \wedge F(e',p,\beta) \wedge F(e \wedge e',p, \gamma \geq \beta) \wedge \forall(\delta > 0)(F(\neg e',p,\delta) \rightarrow \exists(\varepsilon)(e \wedge \neg e',p,\varepsilon \geq \delta))) \rightarrow \exists(\zeta > 0)(F(e,p,\zeta)))$

For all *e*, *e'* and *p*, if (i) *e* is evidence that *S* has *e'*, (ii) *e'* is evidence for *p*, and (iii) *e'* screens off *e* from *p*, then *e* is evidence for *p*.

It is undoubtable that Roche's fix for the *de re* version of the principle works. However, it works, so to speak, by brute force. We can see that if the screening-off conjuncts are satisfied, then evidence of evidence *de re* is evidence, but we would like to know more. In particular, we would like to know *why* satisfaction of the screening-off conditions has this evidential relevance. Moreover, as we shall soon see, although the screening-off condition is sufficient for evidential transitivity, it is not necessary. This means that there will be cases where *e* is evidence of evidence for *p* and *e* is evidence for *p* even though the screening-off condition is not satisfied. In this sense, then, the fix is not adequate, for it fails to capture all the cases we want captured.

Just like the *de re* version of EEE can be immunized from counterexamples by adding to it the screening-off condition, so too can the *de dicto* version.[17] In Roche's case, as in Fitelson's, it is the negative screening-off condition that is not satisfied. The evidential support that E1 ∧ *there is no proposition John has as evidence which is evidence for H'* gives to H' is less than the evidential support that *there is no proposition John has as evidence which is evidence for H'* alone gives H'. This is because in Roche's case John only gets to have evidence for the card being an Ace (H') if the card drawn is the Ace of Spades. So, if we know that John has no evidence for H' then that means the card drawn is not the Ace of Spades, but could still be one of the other aces (3/51). However, if we

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[17] The formalized version is not particulary transparent:

(EEE1 *de dicto* screen off): $\forall(e)\forall(p)\forall(S)\forall(\alpha > 0)\forall(\beta > 0)((F(e,\exists(e')(T(e') \wedge S(e') \wedge F(e',p,\alpha)), \beta)) \wedge (\forall(\gamma > 0)(F(\exists(e')(T(e') \wedge S(e') \wedge F(e',p,\alpha)),p,\gamma)) \rightarrow \exists(\delta)(F(e \wedge \exists(e')(T(e') \wedge S(e') \wedge F(e',p, \alpha)), p, \delta \geq \gamma)))) \wedge (\forall(\varepsilon > 0)(F (\neg\exists(e')(T(e') \wedge S(e') \wedge F(e',p,\alpha)),p,\varepsilon) \rightarrow \exists(\zeta)(F(e \wedge \neg\exists(e')(T(e') \wedge S(e') \wedge F(e',p,\alpha > 0),p, \zeta \geq \varepsilon)))))) \rightarrow \exists(\eta > 0)(F (e, p, \eta)))$

know that he has no evidence for it being an Ace and also that the card is black (E1) then the odds of the card still being an Ace are only 1/25—if it is the Ace of Clubs.

Moreover, the existential version of EEE *de dicto* can also be immunized from our own counterexamples by adding to it a screening-off condition. In the case of E2, the support that the conjunctive proposition that *there is evidence for H'' ∧ H'' is false* provides to H'' is less than the support that *there is evidence for H''* alone provides, so the positive screening-off condition is not satisfied.[18]

The same question that we asked about the fix to the *de re* version applies to the fixes to the *de dicto* versions, namely: what is the evidential relevance of the satisfaction of the screening-off conditions? We return to this question below. For now, we show that, as we anticipated, the screening-off condition is too strong:

E6 = Either c is the Ace of Spades (H) or c is the Jack of Clubs.

E6 is evidence for H, which is evidence for H'. Moreover, the negative screening-off condition is not satisfied: the support that E6 ∧ ¬H give to H' is lower than the support that ¬H alone gives to H'. Yet E6 is indeed evidence for H'. Therefore, the negative screening-off condition is not necessary for evidential transitivity. The same point can be shown using E6 and the screened off version of EEE1 *de dicto* (see footnote 15), since E6 is evidence that there is entailing evidence for H', and the negative screening-off condition is not satisfied for this existential proposition either.

The positive screening-off condition is also not necessary for evidential transitivity:

E7: c is greater than 10 (J/Q/K/A) but c is not the Ace of Spades.

E7 is evidence that c is greater than 10, which is evidence for H'. Moreover, the positive screening-off condition is not satisfied: the support that c is greater than 10 gives to H' is greater than the support that the conjunction of E7 with c is greater than 10 gives to H'. Yet E7 is indeed evidence for H'. Therefore, the positive screening-off condition is not necessary for evidential transitivity. So not only is the screening-off condition not necessary for evidential transitivity, but neither of its conjuncts is.[19] The same point can be shown using E7 and the screened

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[18] Is the negative screening-off condition satisfied? That is a tricky question, for the relevant conditional probability is undefined.

[19] Roche and Shogenji (2014) themselves notice that the negative screening-off condition is only

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off version of EEE1 *de dicto,* since E7 is evidence that there is entailing evidence for H', and the positive screening-off condition is not satisfied for this existential proposition either. The immunized versions of EEE1 *de re* and EEE1 *de dicto*, then, although true, do not provide us with necessary and sufficient conditions for when evidence of evidence is evidence.

Roche's proposed fix for EEE principles does apply to our preferred version. But his fix is subject to two objections. First, it is not clear what is the evidential relevance of the screening-off conditions, and so even if they worked flawlessly we would not have a deep understanding of the resulting principle. Second, they do not work flawlessly, for the screening-off conditions are sufficient but not necessary for evidential transitivity. In the next section we argue that the right fix for the right version of the EEE principle appeals not to screening-off conditions, but to the notion of a defeater. Defeaters wear their epistemic relevance on their sleeves. Moreover, we will argue that a suitable no-defeaters condition offers a necessary as well as a sufficient condition for evidential transitivity.

6 EEE without defeaters

Let us go back to the point that Roche (unsuccessfully, we argued) makes against Fitelson. The point was that it is very easy to have evidence that there is evidence for a proposition. Thus, in the initial card case, we already have evidence that there is evidence that raises the probability of H' to at least 4/5. This raises a natural question: if we know that there is evidence that raises the probability of H' to at least 4/5, why don't we assign a probability of 4/5 to H', rather than 1/13? The answer is the following. We know that there is evidence that raises the probability of H' to at least 4/5 because we know the following proposition: *either the card is an Ace or it is one of five cards, four of which are Aces*. The first disjunct of that proposition just is H', and its second disjunct raises the probability of H' to 4/5. However, we also know that if the second but not the first disjunct is true, then H' is false and the second disjunct misleadingly supports H' to 4/5. So, either both disjuncts are true and there is evidence supporting H' to degree 1 (which happens in 4/52 cases), or there is only misleading evidence which supports H' to 4/5 (and this happens in 48/52 cases). From this we infer

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sufficient and not necessary for evidential transitivity. One condition which does give the right result for the E6 case is Kotzen's "dragging condition" (see Kotzen (2011)). However, as Kotzen notes, the dragging condition itself is only sufficient and also not necessary for evidential transitivity.

that only in 1/13 cases there is non-misleading (and entailing) evidence for H', and so the rational probability of H' is 1/13.[20]

Another way of putting the same point is as follows: we know that if H' is false, then there is evidence that it is true, but there is also a defeater for that evidence— i.e., the falsity of H'. Following Pollock (1986), philosophers usually define defeaters in terms of evidence (or, in Pollock's case, reasons). Thus, *d* is a defeater for the support that *e* gives to *p* if and only if *e* is evidence for *p* and the conjunction *e* ∧ *d* is not evidence for *p*.[21] Using our formalization:

> (d is a defeater for e's support for p): $\exists(\alpha > 0)F(e,p,\alpha) \wedge \neg\exists(\beta > 0)F(e \wedge d,p,\beta)$

We can then also define what it is for there to be a defeater *d* for the evidence *e* there is for *p*, and what it is for there to be evidence (both *de re* and *de dicto*) that such defeaters exist:

> (There is evidence for p, and there is a defeater for that evidence): $\exists(e)(\exists(\alpha > 0)(T(e) \wedge F(e,p,\alpha)) \wedge \exists(d)(\neg\exists(\beta > 0)(T(d) \wedge F(e \wedge d,p,\beta))))$

> (There is evidence that there is a *de re* defeater for e*'s evidence for p): $\exists(e^*)(\exists(\alpha > 0)(T(e^*) \wedge F(e^*,p,\alpha)) \wedge \exists(d)(\neg\exists(\beta > 0)(F(e^* \wedge d,p,\beta)) \wedge \exists(e)\exists(\gamma > 0)(F(e,d,\gamma))))$

> (There is evidence that there is a *de dicto* defeater for e*'s evidence for p): $\exists(e^*)(\exists(\alpha > 0)(T(e^*) \wedge F(e,p,\alpha)) \wedge \exists(e)\exists(\gamma > 0)(F(e,\exists(d)(\neg\exists(\beta > 0)(F(e^* \wedge d,p,\beta))),\gamma)))$

Let us analyze our counterexamples from the previous section in light of these definitions of defeaters. E2 (that there is evidence for H" but H" is false) is evidence that there is evidence for H", and that there is evidence for H" is evidence for H". But E2 is also a defeater for the support that the proposition that there is evidence for H" provides to H": the

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[20] This we get from multiplying the probability for there being non-misleading evidence for H' by the degree to which such evidence would make H' probable. In this case, the former is 1/13 and the latter is 1.

[21] Actually, this is a good definition of a strong defeater, one which completely erases the support that *e* gives to *p*. There are partial defeaters that take away some, but not all, of that support. There are also defeaters that are super-strong: not only do they take away all the support that *e* gives to *p*, but in addition they also counter-support *p*. We will not be dealing with Pollock's distinction between rebutting and undercutting defeaters. For an examination of how to account for defeaters in a Bayesian framework, see Kotzen (ms).

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conjunction of E2 and *there is evidence for H"* is equivalent to E2 itself, and the support that E2 gives to H" is lower than the support that *there is evidence for H"* gives to H". The same goes for E3 and H', E4 and *p*, and E5 and H.

Rather than appealing to the screening-off condition (which, we have seen, is overkill), we believe that the correct way of fixing EEE principles is in terms of this notion of defeaters. Notice a very interesting thing: when *e* is evidence for *p* which is evidence for *q* but *e* is at the same time a defeater for the support that *p* provides for *q*, the positive screening-off condition will not be satisfied. That *e* is a defeater for the support that *p* provides for *q* means that $e \wedge p$ is not evidence for *q*, whereas the positive screening-off condition requires that the support that $e \wedge p$ gives to *q* not be lower than the support that *p* alone provides to *q*. If $e \wedge p$ provides no support at all to *q*, then of course that support will be lower than the one that *p* alone provides—given that *p* provides any positive support, as is required in all EEEs. We have therefore found a partial explanation of the evidential relevance of the positive screening-off condition: it rules out cases where *e* is itself a defeater for the support that *p* provides to *q*. But given that the positive screening-off condition is overkill, we should replace it with a no-defeaters condition.

What about the negative screening-off condition? The cases that exploited a failure of this condition (Fitelson's and Roche's own cases) no longer posed a problem for us once we moved from EEE1 *de dicto* to Existential EEE1 *de dicto*. We know, moreover, that the negative screening-off condition is not necessary for evidential transitivity. We conjecture, then, that we need not add anything like the negative screening-off condition, and we suggest amending Existential EEE *de dicto* as follows:

> (Existential EEE1 *de dicto* no defeat):
> $\forall(e)\forall(p)\forall(\alpha > 0)\forall(\beta > 0)\forall(\gamma > 0)(F(e, \exists(e')(T(e') \wedge F(e',p,\alpha),\beta) \wedge (F(e \wedge \exists(e')(T(e') \wedge F(e',p,\alpha),p,\gamma)) \rightarrow \exists(\delta > 0)(F(e,p,\delta))$

For all *e* and *p*, if (i) *e* is evidence that there is evidence for *p* and (ii) *e* is not a defeater for the support that the proposition that there is evidence for *p* provides for *p*, then *e* is evidence for p.

Existential EEE1 *de dicto* no defeat takes care of our counterexamples to Existential EEE1 *de dicto*, without the overkill of adding a screening-off condition. But is the resulting principle uninteresting? Kotzen (2012) has argued, in a similar context, that principles relevantly like Existential EEE1 *de dicto* no defeat are not "particularly informative." We first reformulate Kotzen's argument so as to apply to our case and then we

reply to it.[22]

According to the reformulation of Kotzen's argument, what we want out of a plausible EEE principle is to be able to decide whether, when *e* is evidence that there is evidence for *p*, *e* itself is evidence for *p*. Crucially, we want the principle to help us find the answer to this question *without requiring us to already know whether e is evidence for p*. Otherwise, the principle would be trivial and useless. In Kotzen's words:

> … we sometimes acquire E, notice that it confirms H1, and then raise our confidence in H2 on that basis, without directly considering the question of whether E confirms H2. So, we don't want the condition… to require us to conditionalize H2 (or any conjunction containing H2) on E. …So, if we're going to have a principle of the sort I'm suggesting, we need to avoid any term in which "H2" appears to the left of the conditionalization bar and "E" appears to the right.[23]

Notice, first, that Kotzen's argument, if correct, applies not only to our Existential EEE1 *de dicto* no defeat, but also to Roches' screening-off versions of EEE. There is room to argue that the argument goes too far. Surely there are situations where considering whether a conjunction containing *e* is evidence for *p* could non-trivially help determine whether *e* is evidence for *p*. For example, we can learn whether caffeine is likely to give us a headache by considering instances where caffeine combined with other substances (sugar, cream, etc.) gives us headaches.

Furthermore, even if the triviality accusation does show such principles to not be genuinely guiding, the objection should still not concern us for a different reason. We do not consider the EEE principles discussed in this paper as heuristics for figuring out when evidence of evidence is evidence. Rather, we think they are to be taken as providing enlightening constraints on when evidence of evidence is evidence. Whether the constraints are enlightening is not to be determined by their capacity to guide somebody who doesn't know *whether*, in a particular case, evidence of evidence is evidence. Rather, whether the constraints are enlightening is to be determined by whether somebody who already knows that, in a particular case, evidence of evidence is not evidence, finds that failure to satisfy the constraints provides a good explanation for *why* evidence of evidence is not evidence in that case. In other words, we are in that familiar position in philosophy when we know whether a particular case has a certain feature

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[22] The following paragraph is a reformulation of Kotzen (2012), pp. 66-7. We emphasize that Kotzen himself does not make this argument against EEE principles, but against (related) principles having to do with the transitivity of probability-raising.

[23] Kotzen (2012), pp. 66-7

or not (in our case, whether evidence of evidence is evidence) but we do not know why. Formulations of EEE principles are to be judged, then, on the basis of their explanatory power regarding this *why* question—and not on the basis of their usefulness in answering the *whether* question. Of course, it may well happen that somebody does find it easier to figure out whether *e* is a defeater for the support that the proposition that there is evidence for *p* provides for *p* than to figure out whether *e* is evidence for *p*, and in that case our principle will indeed be a useful heuristic to that person. But the point is that EEE principles can play the theoretical role we assigned to them without playing this more practical role.

7   Conclusion

We have seen that the slogan "evidence of evidence is evidence" requires disambiguation. It is wrong when taken to mean that evidence of an evidential relation is evidence. It is also wrong when taken to mean that evidence of someone's having evidence is evidence. We distinguished a *de re* from a *de dicto* reading of the slogan and argued that it is only the *de dicto* version that has sufficient initial plausibility, and even that only happens when the evidence suggests *that there is* evidence, rather than merely suggesting that someone has evidence. After mentioning some problems for the Existential *de dicto* version of the principle, we entertained Roche's offered fix and showed it to be overkill. Finally, we identified a different fix, which has the advantages of taking care of our own counterexamples while not leaving out genuine cases of evidence of evidence. Evidence that there is *de dicto* evidence for *p* is itself evidence for *p* when it is not at the same time a defeater for the support that the proposition that there is evidence for *p* provides to *p*. Doesn't quite roll off the tongue, but it has not yet been shown false.

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