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ORIGINAL ARTICLE

Evil and evidence: a reply to Bass

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Abstract

In 'Evil is Still Evidence: Comments on Almeida' Robert Bass presents three objections to the central argument (ENE) in my 'Evil is Not Evidence'. The first objection is that ENE is invalid. According to the second objection, it is a consequence of ENE that there can be no evidence for or against a posteriori necessities. The third objection is that, contrary to ENE, the likelihood of certain necessary identities varies with the evidence we have for them. In this reply I explain why ENE has exactly none of the implications described by Bass. I argue in the concluding section that there is a modal solution to the epistemological problems presented by ENE.

Keywords: Evidence; Evil; S5; S4

Introduction

In Bass (2023), Robert Bass presents three objections to the central argument (ENE) in Almeida (2022a). The main conclusion of ENE ensures that no possible state of affairs S constitutes evidence for or against the thesis that God is essentially omnipotent, omniscient, and morally perfect or $\Box F_G$.[1]

The first objection is that ENE is invalid. In the next section, 'The Main Argument', I provide a simplified version of the argument to the conclusion that no possible state of affairs S incrementally confirms or disconfirms $\Box F_G$. Since no possible state of affairs confirms or disconfirms $\Box F_G$, I conclude that there is no possible evidence for or against $\Box F_G$. It is in fact necessarily true that there is no possible evidence for or against $\Box F_G$.

In the section 'On the Confirmation of $\Box F_G$' I argue that this is exactly what we should expect, since the degree of confirmation or disconfirmation a state of affairs provides for $\Box F_G$ – or any other proposition – approaches zero as the prior probability of $\Box F_G$ approaches 0 or 1. Since the prior probability of $\Box F_G$ is either 0 or 1, we know that $\forall S P(\Box F_G|S) = P(\Box F_G)$. Indeed, we know that $\Box(\forall S P(\Box F_G|S) = P(\Box F_G))$, there is necessarily no state of affairs that confirms or disconfirms $\Box F_G$. This proof requires only the S5 theorem $\Box\Box F_G \vee \Box{\sim}\Box F_G$, and the thesis that necessary propositions are assigned probability 1.

Bass's second objection is that we can validly infer from the main argument ENE that no possible state of affairs constitutes evidence for or against a posteriori necessities such as water = H_2O and Hesperus = Phosphorus. Of course, that consequence would be disastrous for defenders of a posteriori identities. But in 'Evidence and a Posteriori Necessities' I show that the main argument does not apply to contingently existing objects like stars or water or planets. The main argument properly applies to necessarily existing objects like God and numbers and propositions.

Finally, Bass offers reasons to believe that the likelihood of $\Box F_G$ and other necessities varies with the amount and kind of evidence we possess. He argues that there is evidence for and against $\Box F_G$ after all, contrary to the main argument ENE. In the section 'Likelihoods' I show that the move from probabilities to likelihoods does nothing to avoid the main epistemic conclusion in ENE. The likelihood of $\Box F_G$ and the probability of $\Box F_G$ are both independent of any possible state of affairs. So, it is reasonable to conclude that no serious challenges to the main argument are forthcoming from Bass (2023).

In the final section, 'Rational Epistemic Agents and $K_{\sigma\rho}$', I show that rational epistemic agents cannot assign credences $Cr(\Box F_G|S) > 0$ & $Cr(\sim\Box F_G|S') > 0$ without contradiction. And the assumption of irrational epistemic agents offers no genuine solution to the epistemic problems of ENE. I show finally that weakening our logic to $K_{\sigma\rho}$ makes it possible to consistently assign $P(\Box F_G|S) > 0$ & $P(\sim\Box F_G|S') > 0$. But even a brief review of the metaphysical implications of $K_{\sigma\rho}$ displays some highly unconventional consequences.

The main argument

Consider the following simplified version of the main argument in Almeida (2022a). Call the argument ENE.[2]

(1) $P(\Box F_G|S) > 0$
(2) $P(\Box F_G|S) > 0 \rightarrow \Diamond\Box F_G$
(3) $\Diamond\Box F_G \rightarrow \Box F_G$
(4) $\Box F_G \rightarrow \forall S P(\Box F_G|S) = 1$
(5) $\therefore \forall S P(\Box F_G|S) = 1$

The argument is valid and there is a justification for each line. Line (1) is an assumption, though most theists, agnostics, and atheists believe the epistemic or evidential probability of theism is greater than 0, or that there is some evidence in favour of theism. Line (2) is just the contrapositive of the proposition that impossible propositions are assigned probability 0 and so equivalent to $\sim\Diamond\Box F_G \rightarrow P(\Box F_G|S) \ngtr 0$. Line (3) is a characteristic S5 theorem. Line (4) follows from the S4 theorem $\Box F_G \rightarrow \Box\Box F_G$ and the thesis that necessary truths are assigned probability 1.[3] Line (5) follows validly from (1)–(4).

The quantifier in (5) ranges over all possible states of affairs, since all possible states of affairs exist at every world. (5) states that there are no possible states of affairs – states describing natural or moral evils, for instance, or states describing great natural or moral goods – that affect the epistemic or evidential probability of $\Box F_G$.

Note that (6) is an additional consequence of the argument ENE, since it follows from $P(\Box F_G|S) > 0$ in premise (1) that $P(\Box F_G) = 1$.[4]

(6) $\forall S P(\Box F_G|S) = P(\Box F_G)$

According to (6), there is no state of affairs S that provides any confirmation or disconfirmation for $\Box F_G$. Indeed, (6) is necessarily true, since $P(\Box F_G)$ is either 0 or 1 in every world: $P(\Box F_G) = 0 \rightarrow (\forall S P(\Box F_G|S) = P(\Box F_G))$ and $P(\Box F_G) = 1 \rightarrow (\forall S P(\Box F_G|S) = P(\Box F_G))$. The very same reasoning applies to $\sim\Box F_G$, so (7) is also a necessary truth.

(7) $\forall S P(\sim\Box F_G|S) = P(\sim\Box F_G)$

Now, S is evidence for $\Box F_G$ just if S confirms $\Box F_G$, and S is evidence against $\Box F_G$ just if S confirms $\sim\Box F_G$. The relevant sort of confirmation is incremental confirmation.[5] So we will say that some possible state of affairs S confirms $\Box F_G$ just if (8) is true.

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(8) $\exists S P(\Box F_G | S) > P(\Box F_G)$

According to (8), there is some state of affairs S such that the epistemic or evidential probability of $\Box F_G$ given S is greater than the prior probability of $\Box F_G$. (8) states that some state of affairs incrementally confirms $\Box F_G$.

Some possible state of affairs S confirms $\sim\Box F_G$ just if (9) is true.

(9) $\exists S P(\sim\Box F_G | S) > P(\sim\Box F_G)$

According to (9), there is some state of affairs S such that the probability of $\sim\Box F_G$ given S is greater than the prior probability of $\sim\Box F_G$. (9) states that some state of affairs incrementally confirms $\sim\Box F_G$ or, equivalently, some state of affairs incrementally disconfirms $\Box F_G$.

Since (6) and (7) are true, (8) and (9) are false. In fact, (8) and (9) are necessarily false. The conclusion from ENE is that, necessarily, there is no possible state of affairs S that incrementally confirms or disconfirms $\Box F_G$ or $\sim\Box F_G$. So, there is no possible state of affairs that constitutes evidence for or against $\Box F_G$.

On the confirmation of $\Box F_G$

It should come as no surprise that there are no states of affairs that confirm or disconfirm $\Box F_G$. In general, the degree of confirmation or disconfirmation a state of affairs S provides for a proposition F_G – whether or not it is a modal proposition – varies directly with the prior probability of F_G.[6] The very same state of affairs S – that is, the *very same evidence* – provides less and less disconfirmation for F_G as the prior probability of F_G approaches 1. And the very same state of affairs S provides less and less confirmation for F_G as the prior probability of F_G approaches 0. The higher the prior probability of F_G, the less disconfirmation the very same evidence S will provide and the lower the prior probability of F_G, the less confirmation the very same evidence S will provide. At the extremes – where $P(F_G)$ is either 0 or 1 – no possible state of affairs S will provide any confirmation or disconfirmation at all.[7] This is true no matter the modal status of the propositions under consideration. The non-modal variants of (6) and (7) above are as follows:

$$P(F_G) = 1 \rightarrow (\forall S P(F_G|S) = P(F_G))$$
$$P(F_G) = 0 \rightarrow (\forall S P(F_G|S) = P(F_G))$$[8]

So, quite apart from the modality of F_G or $\sim F_G$ – and so quite apart from any S5 assumptions – if we are otherwise *certain* of either F_G or $\sim F_G$, then there is no possible state of affairs S that confirms or disconfirms F_G or $\sim F_G$. And if we are *reasonably certain* of either F_G or $\sim F_G$, then the evidential value of any possible state of affairs S for F_G or $\sim F_G$ will be insignificant.

Let F_G be the non-modal proposition that God exemplifies omnipotence, omniscience, and moral perfection. Consider how much evidence S – the observation of serious intrinsic evils in the world – provides against F_G. If the prior probability for F_G is 0.6 or so – so there is not much evidence for F_G – then S can provide significant disconfirmation for F_G. The state of affairs S is not something we would expect to observe, given F_G, so $P(S|F_G)$ might be roughly 0.5. But it is quite reasonable to assume that we would observe S given $\sim F_G$, so suppose $P(S|\sim F_G)$ approaches certainty.[9] If the probabilities are distributed in this way, S decreases the probability of F_G precipitously, by roughly 30%. The probability of F_G given S, assuming a prior probability of about 0.6, is about 0.42.

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But if our priors for F_G are higher, and the distribution of probabilities is otherwise the same, then the very same evidence S – the very same serious intrinsic evils that we observed – provides much less evidence against F_G. So, if our prior probability for F_G is higher – say, $P(F_G) = 0.9$ or so – the very same evidence S against F_G is much less significant. The counterevidence S will now decrease the probability of F_G from 0.9 to 0.81, a roughly 9% decrease. As the prior probability for F_G approaches certainty the evidential significance of S – and the evidential significance of every other possible state of affairs – approaches 0. The observation of serious intrinsic evils is nearly irrelevant to F_G for those whose priors for F_G are very high. And for those whose prior probability for F_G is 1, there is no state of affairs S that constitutes any confirmation or disconfirmation at all for F_G. In general if $P(F_G) = 1$ or 0, then, for every possible state of affairs S, (10) is true.[10]

(10) $P(F_G|S) = P(F_G)$

But now consider the modal proposition $\Box F_G$. Since it is an S5 theorem that $\Box\Box F_G \vee \Box{\sim}\Box F_G$, we know that our prior probability for $\Box F_G$ is either 1 or 0. Indeed, the prior probability of $\Box F_G$ is necessarily 0 or necessarily 1. But then, for every possible state of affairs S, it is true that (11) or (12). Either way, there is no possible state of affairs S that provides any confirmation or disconfirmation for $\Box F_G$ or ${\sim}\Box F_G$. It is in fact necessary that no possible state of affairs provides any confirmation or disconfirmation for $\Box F_G$ or ${\sim}\Box F_G$.

(11) $\Box(P(\Box F_G|S) = P(\Box F_G))$
(12) $\Box(P({\sim}\Box F_G|S) = P({\sim}\Box F_G))$

Since, necessarily, no possible state of affairs confirms or disconfirms $\Box F_G$ there is no possible evidence for or against $\Box F_G$. And of course the same goes for ${\sim}\Box F_G$.

Evidence and a posteriori necessities

In the section, *The Main Argument*, we saw that the main argument ENE is sound. Among the surprising consequences of ENE is that $\Box\forall S(P(\Box F_G|S) = P(\Box F_G))$, necessarily, no state of affairs confirms or disconfirms $\Box F_G$. In the section, *Likelihood*, below we will find that it is also a consequence of ENE that $\Box\forall S(P(S|\Box F_G) = P(S))$, necessarily, no states of affairs affect the likelihood of $\Box F_G$.

If it is an additional consequence of ENE that no state of affairs confirms or disconfirms theoretical identities – a posteriori necessities such as Hesperus = Phosphorus and water = H_2O – that would be a serious problem for defenders of these a posteriori necessities. Compare Almeida (2023). It is good news then that ENE does not apply to theoretical identities.[11] ENE does not show that we cannot confirm or disconfirm a theoretical identity.

ENE is perfectly consistent with the view that there is evidence for or against a posteriori necessary propositions. Consider the version of ENE in (13)–(17) applied to the theoretical identity statement, Hesperus = Phosphorus.[12]

(13) $P(\text{Hesperus} = \text{Phosphorus}|S) > 0$
(14) $P(\text{Hesperus} = \text{Phosphorus}|S) > 0 \rightarrow \Diamond(\text{Hesperus} = \text{Phosphorus})$
(15) $\Diamond(\text{Hesperus} = \text{Phosphorus}) \rightarrow \Box(\text{Hesperus} = \text{Phosphorus})$
(16) $\Box(\text{Hesperus} = \text{Phosphorus}) \rightarrow \forall S P((\text{Hesperus} = \text{Phosphorus})|S) = 1$
(17) $\therefore \forall S P((\text{Hesperus} = \text{Phosphorus})|S) = 1$

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The argument in (13)–(17) shows, according to Bass, that ENE applies to a posteriori propositions. But this version of ENE is unsound. The problem is with an equivocation on (18).

(18) $\Box$(Hesperus = Phosphorus)

The modal proposition in (18) is either a *de dicto* necessity or a *de re* necessity, and either way the version of ENE in (13)–(17) is unsound. If (18) is a *de dicto* necessity, then it states the following:

Hesperus = Phosphorus in every possible world.

On that reading, line (15) is false. Since Hesperus, unlike God, is not a necessarily existing object, there are worlds in which Hesperus does not exist. In worlds where Hesperus does not exist, it is false that Hesperus = Phosphorus.[13] So, (15) is falsified on the *de dicto* reading of (18).

Alternatively, (18) can be read as a *de re* necessity. Read de re, (18) states the following.

Hesperus = Phosphorus in every world in which Hesperus exists.

Given a *de re* reading of (18), line (16) in ENE is false. If (18) is *de re*, then line (16) in ENE reads as follows:

Hesperus = Phosphorus in every world in which Hesperus exists only if the probability that Hesperus = Phosphorus, on any possible S, is 1.

But consider the state of affairs S that Hesperus does not exist. S is a possible state of affairs and the value of $P(\text{Hesperus} = \text{Phosphorus}|S) \neq 1$. So (16) is false given the de re reading of (18).

So ENE is unsound when applied to a posteriori necessities. In general ENE is unsound when applied to contingently existing objects, so ENE does not entail that there cannot be evidence for and against a posteriori necessities like Hesperus = Phosphorus.

Likelihoods

Bass suggests that analysing evidence in terms of likelihoods will show, contrary to the argument in ENE, that there can be evidence both for and against $\Box F_G$. Unfortunately, Bass's example is another a posteriori necessary proposition, namely, Superman = Clark Kent. As we saw in the section 'Evidence and A posteriori Necessities', ENE does not apply to a posteriori necessary propositions.

But suppose we make the argument in ENE applicable to the Superman case. ENE is applicable to the Superman case only if superheroes exist in every possible world or exist in no world at all. So let's assume that Superman is a necessarily existing being. On this assumption ENE entails that there cannot be evidence for or against the identity, Superman = Clark Kent.[14]

Consider some alleged evidence for the proposition that Superman = Clark Kent. The state of affairs S that we never observe Superman and Clark Kent in the same room, for instance, at least appears to be evidence that Superman is identical to Clark Kent. The fact that Superman = Clark Kent, it might be argued, *explains why* we never observe them in the same room.[15] According to Bass, S is more probable on the hypothesis that Superman = Clark Kent than it is on the hypothesis that Superman ≠ Clark Kent. And so, Bass concludes, Superman = Clark Kent is more *likely* on our observation S than is

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Superman $\neq$ Clark Kent. Bass concludes that, on the likelihood approach to evidence, S provides evidence for the proposition that Superman = Clark Kent.

> Let M = Superman and K = Clark Kent and let S state that we never observe both Superman and Clark Kent in the same room. According to Bass, (19) is true.

(19) $P(S|M = K) > P(S)$

If (19) is true, then never observing Superman and Clark Kent separately in the same room increases the likelihood that Superman = Clark Kent, and so constitutes evidence for M = K. If M $\neq$ K, then we would expect to occasionally see Superman and Clark Kent in the same room.

But if Superman is a necessarily existing object, then ENE applies to the Superman example as well. In that case (19) is false and (20) is true. According to (20), S does not affect the likelihood that M = K at all.[16]

(20) $P(S|M = K) = P(S)$

The probability that we never observe both Superman and Clark Kent in the same room given that Superman = Clark Kent is equal to the prior probability of that observation. The proposition in (20) follows from the fact in (21).

$$
\begin{aligned}
(21)\ P(S|M = K) &= P(S).P(M = K|S)/P(M = K)\\
&= P(S).1/1\\
&= P(S)
\end{aligned}
$$

We know from ENE that $P(M = K|S) = P(M = K)$ since $P(M = K) = 1$.[17] So $P(S\ |M = K) = P(S)$. The probability of S given that Superman = Clark Kent just equals the prior probability of S. Since it is true that $\Box(M = K)$, the fact that Superman = Clark Kent does not increase the probability of S at all. Indeed it does not have any stochastic effect on the observation in S. Note that M = K *does* affect the probability of S under the assumption that Superman is a contingently existing object. If Superman is not a necessarily existing object, then the argument in ENE doesn't apply.

Given the necessity of Superman, the probability of S is also unaffected by the assumption that M $\neq$ K.[18]

(22) $P(S|M \neq K) = P(S)$

According to (22), the probability that we never observe Superman and Clark Kent in the same room given that Superman $\neq$ Clark Kent is equal to the prior probability of S. The proposition in (22) is true and follows directly from the fact in (23).

$$
\begin{aligned}
(23)\ P(S|M \neq K) &= P(S).P(M \neq K|S)/P(M \neq K)\\
&= P(S).1/1\\
&= P(S)
\end{aligned}
$$

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We know from ENE that $P(M \neq K|S) = P(M \neq K)$.[19] So $P(S\ |M \neq K) = P(S)$. The probability of S given that Superman ≠ Clark Kent just equals the probability of S. Since it is true that $\Box(M \neq K)$, the fact that Superman ≠ Clark Kent does not increase the probability of S at all. Indeed, it has no stochastic effect on the observation in S. So, contrary to Bass's claim, the observation S – that we never see Superman and Clark Kent in the same room – does not make $M = K$ more likely or less likely than $M \neq K$. The probability of S is the same whether $M = K$ or $M \neq K$.

Similarly, understanding evidence in terms of likelihoods does not affect the fact that there is no evidence for or against $\Box F_G$. We know from ENE that (24) and (25) are true.

(24) $P(\Box F_G|S) = P(\Box F_G)$
(25) $P(\sim\Box F_G|S) = P(\sim\Box F_G)$

From (24) we can derive (26), and $\Box F_G$ does not make any state of affairs S any more probable than it was.

(26) $P(S|\Box F_G) = P(S)$

From (25) we can derive (27) and $\sim\Box F_G$ does not make any state of affairs S any more probable than it was.

(27) $P(S|\sim\Box F_G) = P(S)$

So, there is no state of affairs S that increases the likelihood of $\Box F_G$ and there is no state of affairs S that increases the likelihood of $\sim\Box F_G$. The likelihood approach does not show that we have any evidence either for or against $\sim\Box F_G$ or $\Box F_G$.

Rational epistemic agents and $K_{\sigma\rho}$

In augmented S5 the identity in (28) is necessarily true and so it is impossible that any state of affairs confirms or disconfirms $\Box F_G$. And since no states of affairs could confirm or disconfirm $\Box F_G$ it is impossible that any state of affairs constitutes any evidence for or against $\Box F_G$.

(28) $\forall SP(\Box F_G|S) = P(\Box F_G)$

$\forall SP(\Box F_G|S)$ has exactly the same value in every possible world and therefore so does $P(\Box F_G)$. There is no possible observation in any world – the order and goodness of the world or the vast evils of the world or religious experiences or testimony to the miraculous – that increases or diminishes the epistemic or evidential probability of $P(\Box F_G)$. So there is no possible observation that provides any confirmation of $\Box F_G$ or $\sim\Box F_G$.

It is impossible that $P(\Box F_G|S) > 0$ & $P(\sim\Box F_G|S) > 0$, but it is also impossible that $P(\Box F_G) > 0$ & $P(\sim\Box F_G) > 0$. Since the prior probability of $\Box F_G$ and $\sim\Box F_G$ cannot both be positive, the intrinsic probability of $\Box F_G$ & $\sim\Box F_G$ – namely, their *a priori probability* prior to any empirical investigation – cannot both be positive. An epistemic agent cannot have some a priori reason to believe $P(\Box F_G) > 0$ and also have some a priori reason to believe $P(\sim\Box F_G) > 0$.

The likely source of these epistemological difficulties is premise (2) or premise (3) in ENE.

(2) $P(\Box F_G|S) > 0 \rightarrow \Diamond\Box F_G$
(3) $\Diamond\Box F_G \rightarrow \Box F_G$

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The probability axioms prohibit rational epistemic agents from putting a positive epistemic probability on an impossible proposition. But the probability axioms also prohibit rational agents from putting a *positive credence*, or positive subjective probability, on an impossible proposition. So, violations of (2) are prohibited, but so are violations of (29).

(29) $Cr(\Box F_G|S) > 0 \rightarrow \Diamond\Box F_G$

Since rational epistemic agents cannot assign a positive probability to impossible propositions, it is not possible that rational agents have positive credences both for and against the existence of God. The credences in (30) are not possible.

(30) $Cr(\Box F_G|S) > 0 \ \& \ Cr(\sim\Box F_G|S') > 0$

The assumption in (31) generates the very same argument for credences that the assumption in (1) generates for epistemic probabilities in ENE.

(31) $Cr(\Box F_G|S) > 0$

The proposition in (31) states that an epistemic agent puts some positive credence – has some non-zero degree of belief – in $\Box F_G$ given S. But rational agents cannot have any positive credence on $\Box F_G$ without being certain that $\Box F_G$ on any possible state of affairs S.

(32) $\forall S Cr(\Box F_G|S) = 1$

And of course we can also prove that the credence version of the identity in (6). (33) is necessarily true.

(33) $\forall S Cr(\Box F_G|S) = Cr(\Box F_G)$

Of course, irrational epistemic agents might violate the rational constraints in (2) and (29). But the existence of irrational epistemic agents does not make (6), (7), and (33) false, and does not make it possible that $P(\Box F_G|S) > 0 \ \& \ P(\sim\Box F_G|S') > 0$ or that $Cr(\Box F_G|S) > 0 \ \& \ Cr(\sim\Box F_G|S') > 0$. Instead, the irrationality of agents is the hypothesis that explains why agents have such inconsistent credences.

But there are also hypotheses explaining why *rational* agents might assign $P(\Box F_G|S) > 0 \ \& \ P(\sim\Box F_G|S') > 0$ and $Cr(\Box F_G|S) > 0 \ \& \ Cr(\sim\Box F_G|S') > 0$. Modal logics weak enough to ensure that essential properties are contingently essential and contingent properties are contingently contingent – logics in which objects can survive the acquisition and loss of essential properties – provide a genuine solution to the epistemological problems in ENE. In $K_{\rho\sigma}$, for instance, both (3) and (4) are false and ENE is invalid.

(3) $\Diamond\Box F_G \rightarrow \Box F_G$
(4) $\Box F_G \rightarrow \forall S P(\Box F_G|S) = 1$

And even in logics as strong as S4, (4) is true, but (3) is false. So, S4 can avoid the problems of ENE, too. But in S4 we cannot assign $P(\sim\Box F_G|E)$ any value except 0 or 1, where E is our total evidence. So, (34) is impossible in S4.[20]

(34) $P(\sim\Box F_G|E) = n \ \& \ P(\Box F_G|E) = (1 - n), \ (0 < n < 1)$

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Since (34) is false, we cannot assign $\Box F_G$ and $\sim\Box F_G$ a positive probability on our total evidence E. And (34) is nearly as bad as the impossibility in S5 that $P(\Box F_G|S) > 0$ & $P(\sim\Box F_G|S) > 0$.

Since it is true in $K_{\rho\sigma}$ that $\nvdash \Box F_G \rightarrow \Box\Box F_G$ and $\nvdash \Diamond{\sim}F_G \rightarrow \Box{\sim}\Box F_G$, there are no theorems guaranteeing that the essential properties of objects are necessarily essential or that the contingent properties of objects are necessarily contingent. As a result, it is possible that $P(\Box F_G) > 0$ & $P(\sim\Box F_G) > 0$ and also possible that $P(\Box F_G|S) > 0$ & $P(\sim\Box F_G|S) > 0$. So, there are no epistemological problems forthcoming from ENE. Further, it is possible that $Cr(\Box F_G|S) > 0$ & $Cr(\sim\Box F_G|S') > 0$, so rational epistemic agents can have partial beliefs in both $\Box F_G$ and $\sim\Box F_G$.

But the solution to the epistemological problems provided by $K_{\rho\sigma}$ has some unexpected consequences. For instance, it is true in $K_{\sigma\rho}$ that God can survive the acquisition of an essential property and can also survive the loss or exchange of an essential property. Theists might view this as just one more consequence of divine omnipotence. Neither conjunct in (35) is true in S5 and the left conjunct is false in S4. But both conjuncts are true in $K_{\sigma\rho}$.

(35) $\Diamond(\Box F_G \ \& \ \Diamond{\sim}\Box F_G) \ \& \ \Diamond(\Diamond\Box F_G \ \& \ {\sim}\Box F_G)$

Given (35) God can acquire the nature of a human being – confirming an article of faith among some theists – but God can also acquire the nature of a tortoise – an exotic theological view on any account. It is even possible in $K_{\sigma\rho}$ for God to exemplify $\Box Fx$ and to survive the loss of the property Fx. (36) is possible.

(36) $(\Box F_G \ \& \ \Diamond{\sim}\Box F_G) \ \& \ \Diamond\Diamond{\sim}F_G$

Given (36), God can survive the loss of essential omnipotence and the loss of essential moral perfection. It is not possible that God lacks omnipotence altogether, but it is *possibly* possible that God lacks omnipotence altogether. That is, there are possible worlds in which it is true that God is not *essentially* omnipotent. This is possible because what is essential to objects in $K_{\sigma\rho}$ is a purely contingent matter. Unlike S4 and S5, what is essential to God is not necessarily essential.

Note too that nothing in $K_{\sigma\rho}$ rules out (37) according to which an essentially human Socrates might become essentially an alligator.[21] Socrates might even persist through an exchange of essential properties with another species.

(37) $\Box H_S \ \& \ \Diamond\Diamond(\Box A_S \ \& \ {\sim}H_S)$

Generalizing on (37), it is true in $K_{\sigma\rho}$ that God and everything else can persist through a complete sortal change. A complete change in kind. Nothing in $K_{\sigma\rho}$ precludes the possibility that Socrates becomes essentially a cat or essentially a tree. And the same of course is true for God. Since all essential properties are contingently essential, there are almost no changes through which an object cannot persist.[22]

Neither S5 nor S4 provides a solution to the epistemological problems for $\Box F_G$. S5 validates (3)–(4) and S4 makes (34) impossible. $K_{\sigma\rho}$ does provide a solution to the epistemological problems for $\Box F_G$, but some will find the metaphysical consequences of $K_{\sigma\rho}$ implausible.

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Notes

1. $\Box F_G$ is the proposition that God is essentially omnipotent, omniscient, morally perfect, etc.
2. 'ENE' stands for evil is not evidence. In augmented S5 there is a similar argument that, for all S, $\Box F_G$ is not more likely on S, either.

(1) $P(\Box F_G|S) > 0$
(2) $P(\Box F_G|S) > 0 \to \Diamond\Box F_G$
(3) $\Diamond\Box F_G \to \Box F_G$
(4) $\Box F_G \to (\forall S P(S|\Box F_G) = P(S))$
(5) $\forall S P(S|\Box F_G) = P(S)$

3. Note that $P(\Box F_G) = 1 \to \forall S P(\Box F_G|S) = 1$. In general, a proposition A is certain only if A is certain given any state of affairs S.
4. The ENE argument to (6) and (7) are as follows. (1)–(3) are the first three lines in ENE. The argument for (6).

(1) $P(\Box F_G|S) > 0$
(2) $P(\Box F_G|S) > 0 \to \Diamond\Box F_G$
(3) $\Diamond\Box F_G \to \Box F_G$
(4) $\Box F_G \to$(1)–(3)
(5) $\Box\Box F_G \to$ (4), S5
(6) $P(\Box F_G) = 1 \to$ (5)
(7) $\forall S P(\Box F_G|S) = P(\Box F_G)$ (6)

The identity in line (7) is a necessary truth, since it holds whether $P(\Box F_G) = 0$ or 1. And now the argument for (7).

(1) $P(\sim\Box F_G|S) > 0$
(2) $P(\sim\Box F_G|S) > 0 \to \Diamond\sim\Box F_G$
(3) $\Diamond\sim\Box F_G \to \sim\Box F_G$
(4) $\sim\Box F_G \to$ (1)–(3)
(5) $\Box\sim\Box F_G \to$(4), S5
(6) $P(\sim\Box F_G) = 1 \to$ (5)
(7) $\forall S P(\sim\Box F_G|S) = P(\sim\Box F_G) \to$ (6)

The identity in (7) is a necessary truth, since it holds whether $P(\sim\Box F_G) = 0$ or 1.
5. Compare the distinction between incremental confirmation and absolute confirmation. We will say that S incrementally confirms $\Box F_G$ just if $P(\Box F_G|S) > P(\Box F_G)$. To say that S absolutely confirms $\Box F_G$ is just to say that $P(\Box F_G|S)$ is high (even if S incrementally disconfirms $\Box F_G$). See Otte (2000, 5-6), but compare Carnap (1950).

> Confirmation can mean at least two things. It can be taken in the incremental sense, which is that evidence confirms a hypothesis if it raises the probability of the hypothesis, and evidence disconfirms a hypothesis if it lowers the probability of the hypothesis. Or it can be taken in the absolute sense, which is that the probability of the hypothesis on the evidence is high. These two concepts of confirmation are very different, but a strong case can be made that when we claim that some evidence confirms a hypothesis we are normally using the incremental concept of confirmation.

6. See Almeida and Thurow (2021). See also Wykstra (1996).
7. Since F_G is a contingent proposition, the regularity requirement ensures that in most cases $P(F_G)$ will not actually reach 0 or 1.
8. How do we know $P(F_G) = 0 \to (\forall S P(F_G| S) = P(F_G))$? We know that:

(1) $P(F_G) = 0 \to$ Assumption
(2) $P(F_G) = 0 \to P(\sim F_G) = 1$
(3) $P(\sim F_G) = 1 \to \forall S P(\sim F_G|S) = 1$
(4) $\forall S P(\sim F_G| S) = 1 \to \forall S P(F_G|S) = 0$
(5) $\forall S P(F_G| S) = 0 \to (\forall S P(F_G|S) = P(F_G))$
(6) $\therefore P(F_G) = 0 \to (\forall S P(F_G|S) = P(F_G))$

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9. The exact distribution of these probabilities does not matter to the argument.
10. If $P(F_G) = 0$ then $P(\sim F_G) = 1$ and so $P(\sim F_G|S) = 1$. So, $P(F_G|S) = 0$ and (11) is true. (11) $P(F_G|S) = P(F_G)$
11. Saul Kripke and Penelope Mackie provide an analysis of necessary identity for contingent objects which preserves the a posteriority of necessary identity. For further discussion, see Almeida (2023), Kripke (2011a) and Mackie (2006).
12. Examples like water = H_2O present additional complications since 'water' and 'H2O' are predicates (general terms) and not singular terms. So strictly they cannot flank an identity sign. Necessary coextension might be a better regimentation, $\Box\forall x(x \text{ is water} \longleftrightarrow x \text{ is } H_2O)$. In addition, there are other well-known worries about rigid designation and general terms. If general terms are rigid, they do not refer to the same – numerically identical – substance in every world in which the substance exists, but to a qualitatively identical substance in every world in which there exists that kind of substance. So we have an entirely different notion of rigidity at work.
13. Hesperus = Phosphorus $\vdash \exists x(x = \text{Phosphorus})$. But since $\sim\exists x(x = \text{Phosphorus})$ in some worlds, it follows that $\sim$(Hesperus = Phosphorus) in some worlds. Modal logics that have a free logic basis invalidate this inference and might allow objects to exemplify properties in worlds in which they do not exist, but that's a price that objectors to a posteriori identities might not wish to pay.
14. There are of course additional issues arising from the use of fictional discourse and non-referring singular terms. Let's set these aside and assume that these terms are non-empty proper names.
15. A referee for *Religious Studies* makes the following observation.

> one might think that, at least in that kind of case, we should opt for a different view [of evidence]; perhaps, for example, some kind of explanationist account of evidence. (That is, some sophisticated version of the claim that E is evidence for S just in case S explains E, where explanation is not understood in terms of confirmation.)

But we have an explanationist account of evidence in this very section. The identity M = K explains S, but the explanationist account fails, too. The explanationist account of evidence cannot avoid the problems forthcoming from ENE.
16. Note that $P(\sim S|M = K) = P(\sim S)$ is also true, so the observation of Superman and Clark Kent in the same room also does not affect the likelihood that M = K.
17. Compare propositions (6) and (7) above.
18. It also follows under this assumption that $P(S|M = K)$ = undefined.
19. Compare propositions (6) and (7) above.
20. See Almeida (2022b), 294ff.
21. (37) $\Box H_S \,\&\, \Diamond\Diamond(\Box A_S \,\&\, \sim H_S)$ is true at w_0 in the following $K_{\sigma\rho}$ model.

$\overset{\curvearrowleft}{w_0} \leftrightarrow \$\overset{\curvearrowleft}{w_1} \leftrightarrow \$\overset{\curvearrowleft}{w_2}$

$\Box H_S \,\&\, \Diamond\Diamond(\Box A_S \,\&\, \sim H_S) \quad A_S \,\&\, H_S \quad \Box A_S \,\&\, \sim H_S$

22. For additional details and consequences of see $K_{\sigma\rho}$, see Almeida (2022b), esp. 301–306.

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