A Note on Knowledge-First Decision Theory and Practical Adequacy

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# 1. Introduction

According to Williamson (2000), your evidence at a given time is given by all the propositions you know at that time. According to traditional decision theory, in figuring out what to do you should consider all the states that are compatible with your evidence. The combination of the two views, knowledge-first decision theory, has it then that in figuring out what to do you should consider all and only those states compatible with what you know. If knowledge by inductive inference is possible, however, knowledge-first decision theory would have you rule out for considerations states which you shouldn’t rule out. In this note I first present this problem for knowledge-first decision theory, and then suggest a fix for it based on the idea that a proposition cannot be known unless it is practically adequate.

# 2. Knowledge-First Decision Theory

Traditional decision theory has it that a decision problem is determined by a matrix such as the following:

|  |  |  |
| --- | --- | --- |
|  | S1 | S2 |
| A1 | O1 | O2 |
| A1 | O3 | O4 |
| Table 12.1 |  |  |

The row headings on the table represent the acts available to the agent, the column headings the states of the world that the agent considers possible, and the cells the possible outcomes of the actions. $O1$, for instance, is the outcome that results if the agent performs action $A1$ and the world is in state $S1$. It is assumed that the agent’s preferences between outcomes can be represented by a utility function which assigns a number to each outcome. It is also assumed that a probability function is defined over the set of possible states of the world. Different representation theorems show how such utilities and probabilities can be derived from simple preferences of the agent, but I will not be concerned here with such reductions. Assuming that the relevant utility and probability functions exists, then, traditional decision theory is the claim that an action is rational just in case it maximizes expected utility. The expected utility of an action $A$ is a weighted average of the utilities of all the possible outcomes of $A$, where the weights are provided by the probability function in question.

When a possible state of the world is assigned 0 by the probability function, then it doesn’t have any effect on the expected utility calculation. A crucial question for a normative interpretation of decision theory (that is to say, an interpretation according to which it models how agents *ought* to decide) is: which states should be assigned probability 0? This question can be put in Bayesian lingo: are there any constraints on which *prior probabilities* subjects can assign to different propositions? Subjective Bayesians (such as Jeffrey (1965)) are happy to leave the choice of priors completely unconstrained, save for the requirement that they be indeed probabilities. Some other decision theorists think that this is too subjectivist to have any real normative bite, and so provide some further constraints (for instance, Lewis (1980) argues for the “Principal Principle”, regarding deference to chances). At the other extreme, Objective Bayesians hold that that there is a unique rational prior. Williamson himself is an Objective Bayesian of this extreme kind. This version of Objective Bayesianism is often dismissed as a non-starter (for instance, Kelly (2005), takes its falsity for granted), but it shouldn’t. It is the equivalent, in the fine-grained framework, of the thesis of Uniqueness in the traditional binary epistemological framework, a thesis so embedded in epistemological theorizing that until recently it wasn’t even explicitly discussed. Its denial amounts to a kind of epistemological relativism that is no more acceptable in the fine-grained than in the binary realm.

Be that as it may, what I am interested in this paper is not Williamson’s objectivism (with which I agree), but rather another aspect of his overall view which is also related to the issue of to which states can subjects assign probability 0. Traditional Bayesianism has a nominal answer to this question: precisely those states incompatible with the evidence the subject has at the time. The answer is merely nominal because Bayesians, as such, do not have a theory of evidence. Again, Subjective Bayesians will say that a subject’s evidence at a time are whatever propositions the subject assigns credence 0 to at that time. Williamson, however, identifies a subject’s evidence at a time with what the subject knows at that time, a view enshrined in the equation E = K. The overall Objective Bayesian picture from Williamson, then, is there is a unique rational prior assignment of probabilities to states, and that the probability assignment that is rational for a subject to hold at any given time is the result of conditionalizing that prior on whatever the subject knows at that time.[[1]](#endnote-1) This means that, for Williamson, a subject should take into account only those states which are compatible with her knowledge at any given time.

# 3. A Problem for Knowledge-First Decision Theory

The view that a subject need only consider those states which are compatible with what she knows in figuring out what to do has a number of untoward consequences. Here I concentrate on just one.[[2]](#endnote-2)

Assume that it is possible to come to know a proposition $p$ inferentially on the basis of another proposition $q$ which doesn’t entail $p$. Of course, given E = K, whenever a subject knows a proposition $p$, $p$ itself is then part of her evidence, and so the subject’s total evidence does entail $p$—because any proposition entails itself. But E = K is still compatible with the possibility of inductive inferential knowledge as I have just characterized it. It is not true in general (and perhaps it is never true) that when a subject has inferential knowledge of a proposition $p$ the inferential basis is $p$ itself. We can distinguish between the subject’s total evidence and the subject’s “basing evidence”. If E = K is right, these two will often come apart: the propositions which we use as an inferential basis form a proper subset of all the propositions we know at a given time. So, E = K is compatible with the claim that it is possible for a subject to have inferential knowledge of a proposition $p$ even if her basing evidence does not entail $p$. Indeed, many philosophers will see compatibility with this kind of inductive inferential knowledge as a constraint on any adequate epistemological theory.[[3]](#endnote-3)

To be specific, let us suppose that you know that train A will leave on time today, based on hard to specify evidence which includes your background knowledge about the on-time statistics for train A and several other pieces of evidence. This evidence is indeed hard to specify, but we will also assume that it doesn’t entail that train A will leave on time. It is compatible with all that evidence, for instance, that some accident up ahead on the tracks prevents train A from leaving on time today. For the sake of specificity, let us say that the conditional probability of the ur-prior on your basing evidence for the proposition that train A leaves on time today is .903.[[4]](#endnote-4)

Let us now also specify your practical preferences. You are going where train A would take you, but it is crucial that you get to your destination on time. If train A leaves on time, then you will indeed make it, with some time to spare. The alternative is to get an Uber, which will get you there on time, but will also cost significantly more. Indeed, let us assume that your preference for being on time (whatever the cost) vs. not being on time is such that, given a probability of .903 that train A will be on time, taking an Uber has a higher expected utility for you.

Given this setup, the problem for knowledge-based decision theory is the following. Given that you know that train A will be on time, in figuring out what to do you should not take into account a state of the world where train A is not on time. Therefore, given the higher cost of taking an Uber, it obviously maximizes expected utility for you to take train A. So, according to knowedledge-based decision theory, you should take train A. But this is the wrong result: given the specification of the case, you should take an Uber. There are two relevant probabilities in question: one is the probability that train A will be on time, conditional on everything you know; the other is the probability that train A will be on time, conditional on the evidence on the basis of which you believe that train A will be on time. Assuming, as we are doing, that you know that train A will be on time on the basis of some inductive evidence, these two will come apart. Which of them, then, is the relevant one—that is to say, which of those two probabilities should we use to weigh the utilities in question? Obviously, we should use the basing evidence probability. Using your total probability artificially inflates the likelihood that train A will be on time. You should not exclude the possibility that train A will not be on time, as you would have to do if you were to use your total evidence (according to E = K) for that purpose. Therefore, knowledge-based decision theory has the wrong consequence here.

# 4. The Practical Adequacy Condition on Knowledge

The problem for knowledge-based decision theory arises from a combination of two factors: there is a proposition you know (that train A will leave on time), and yet your rational credence in that proposition is less than 1. Whenever this happens, it will be possible to come up with a preference structure such that it is rational for you to act as if the proposition in question is false.[[5]](#endnote-5) Knowledge-based decision theory, however, has it that you should always act as if every proposition you know is true.

The claim that, if you know a proposition, then you should act as if it is true, is held not only by proponents of E = K and knowledge-based decision theory, but also by a number of other philosophers. Indeed, some philosophers have elevated this claim to the position of an independent necessary condition on knowledge.[[6]](#endnote-6) Say that if your rational credence in a proposition is high enough for it to be rational for you to act as if it is true, then that proposition is practically adequate for you.[[7]](#endnote-7) What some philosophers have claimed, then, is that a belief cannot amount to knowledge for a subject unless it is practically adequate for that subject. Thus, in the situation described above, you would not know that train A will be on time, because that proposition is not practically adequate for you.

The idea of the practical adequacy condition on knowledge is that your preferences can prevent you from knowing a proposition no matter how likely that proposition is on your basing evidence (provided that it is less than certain). It is not that knowledge in itself requires an arbitrarily high probability of the proposition in question on your basing evidence, but rather that your preferences set a lower bound for that probability. A consequence of this is that the view that practical adequacy is a condition on knowledge is committed to the truth of some rather odd-sounding counterfactuals, such as the following: had it not been so important to you to be on time, you would have known that train A will be on time. Notice that the view that practical adequacy is a condition on knowledge is compatible with the possibility of knowledge on the basis of non-entailing evidence—it just is not compatible with the possibility of knowledge on the basis of evidence insufficient for practical adequacy.

# 5. Practical Adequacy to the Rescue?

If you cannot know a proposition unless it is practically adequate for you, then the problem for knowledge-based decision theory disappears. The problem, recall, arises from the fact that it is possible to know a proposition on the basis of non-entailing evidence. For if this kind of knowledge is possible, then we can tinker with your preferences while keeping fixed the rational credence in the proposition in question, with the result that the proposition is not practically adequate. But, of course, if practical adequacy is a condition on knowledge, then this last step fails. We cannot freely tinker with the subject’s preferences while keeping fixed whether she knows the proposition or not, for tinkering with the subject’s preferences can *make it the case* that she no longer knows the proposition in question. And, of course, the kind of tinkering needed to make the proposition no longer be practically adequate is precisely the kind of tinkering that, according to practical adequacy condition, destroys knowledge.

Thus, the practical adequacy condition can help with a serious problem for knowledge-first decision theory. Whether the help is welcome or not depends, of course, on whether the practical adequacy condition is itself plausible. In this note, I merely wanted to notice a point of contact between two influential views in contemporary epistemology.

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1. The conditionalization of a probability function $Pr$ on a proposition $E$ is the conditional probability function $Pr'(-|E)$, which is in turn defined as a ratio of unconditional probabilities: $fracPr(-∧E)Pr(E)$. The conditional probability is undefined whenever $Pr(E)=0$. Williamson’s updating rule is a kind of ur-prior conditionalization rather than the traditional Bayesian conditionalization rule. For more on conditional probabilities see Hájek (2003), and for more on ur-prior conditionalization see Meacham (2016). [↑](#endnote-ref-1)
2. For more on the problems with knowledge-based decision theory, see Comesaña (forthcoming) [↑](#endnote-ref-2)
3. My own view on this is more complicated. See my dispute with Pryor in Comesaña (2013b), Pryor (2013), and Comesaña (2013a). [↑](#endnote-ref-3)
4. This ridiculous level of specificity serves in part to highlight the problem of false precision (see Kaplan (1996)), but that problem is orthogonal to the issues in which I am interested here. [↑](#endnote-ref-4)
5. To act as if a proposition is true is to maximize utility in worlds where the proposition is true, and *mutatis mutandis* for acting as if a proposition is false. [↑](#endnote-ref-5)
6. See, for instance, Fantl and McGrath (2002). [↑](#endnote-ref-6)
7. The terminology of “practical adequacy” is from Anderson and Hawthorne (forthcoming). [↑](#endnote-ref-7)