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Probabilities of counterfactuals and counterfactual probabilities

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ABSTRACT

Probabilities figure centrally in much of the literature on the semantics of conditionals. I find this surprising: it accords a special status to conditionals that other parts of language apparently do not share. I critically discuss two notable 'probabilities first' accounts of counterfactuals, due to Edgington and Leitgeb. According to Edgington, counterfactuals lack truth values but have probabilities. I argue that this combination gives rise to a number of problems. According to Leitgeb, counterfactuals have truth conditions-roughly, a counterfactual is true when the corresponding conditional chance is sufficiently high. I argue that problems arise from the disparity between truth and high chance, between approximate truth and high chance, and from counterfactuals for which the corresponding conditional chances are undefined. However, Edgington, Leitgeb and I can unite in opposition to Stalnaker and Lewis-style 'similarity' accounts of counterfactuals.

1. Introduction

My topic is the interaction of probabilities and counterfactuals. Can probabilities illuminate the semantics of counterfactuals: their truth conditions (or lack thereof), their approximate-truth conditions, and their logic?

It is natural to think that probabilities of conditionals are parasitic on their truth conditions. After all, that is the model that we find with the basic connectives: probabilities of conjunctions, disjunctions, and negations are determined by their respective truth conditions, rather than the other way round. Similarly, probabilities of quantified statements display the same order of dependence. And so it apparently goes with

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almost all of our language that is probability-apt: it's truth first, probability second.[2] But a striking theme in much of the conditionals literature is that this order of dependence is reversed for conditionals: their probabilities are regarded as primary, and consequences for their truth conditions—or lack thereof—are then drawn. Then there are accounts that write probabilities into the truth conditions themselves, thus still giving probabilities primacy.[3] Either way, I find it surprising that conditionals should have special status in having their semantics underpinned probabilistically. But if they should, then that fact is striking in itself.

In this paper I will discuss two notable 'probabilities first' accounts of counterfactuals: those presented in agenda-setting papers by Edgington [6] and by Leitgeb [16,17].

2. Edgington's account

2.1. Outline of the account

Edgington begins with a partial job description for counterfactuals:

> they have figured ... in accounts of causation, perception, knowledge, rational decision, action, explanation, and so on. And outside philosophy, in ordinary life, counterfactual judgements play many important roles, for instance in inferences to factual conclusions ... (1)

She has long been an influential advocate of a *suppositional* account of indicative conditionals.

> On this view, a conditional statement is not a categorical assertion of a proposition, true or false as the case may be; it is rather a statement of the consequent under the supposition of the antecedent. A conditional belief is not a categorical belief that something is the case; it is belief in the consequent in the context of a supposition of the antecedent. (2)

Enter probability theory. Edgington regards the strongest evidence for the suppositional account to come from the way uncertain conditional judgments work. Our best theory of uncertainty is probability theory, and our best understanding of conditional uncertainty is conditional probability. Putting these ideas together, a core part of her account is Adams' Thesis that the probability of an indicative conditional 'if A, then B' is the conditional probability of B, given A (where this is defined). But this probability is not to be understood as that of the conditional's *truth*. On the contrary, it is equally central to the account that indicative conditionals do not have truth values.

Various authors (including [1,3,4,8], and [22]) subscribe to this theory of indicative conditionals alongside Edgington. But most authors believe that counterfactuals must be treated differently—typically with some sort of 'similarity' semantics, à la Stalnaker [27] and Lewis [19]. Edgington insists, however, that counterfactuals and indicative conditionals should be given parallel treatment. She forcefully argues that "the easy transitition [sic.] between 'suppose' and 'if' is as evident for subjunctives as it is for indicatives." (4–5). And it is certainly welcome that her view gives a unified treatment of 'if'—especially so when indicatives and counterfactuals seem to coincide in the future tense. Above all, according to her they should be given unified *probabilistic*, rather than truth conditional, treatment.

However, as she is well aware, their treatment had better not be *too* unified: witness our divergent assessments of

[2] Or such is the dominant position in the literature. Exceptions include Field [7], Leblanc [15], and Harper [13], who offer probability-first semantics for classical logic. Of course, once we introduce the counterfactual connective into our language, our logic is no longer classical.

[3] The probabilities that are given primacy here might not be probabilities *of counterfactuals*, but rather probabilities of the counterfactuals' consequents, given their antecedents—as we will soon see.