Yunbing Li
Department of Philosophy, University of Calgary, AB, Canada
E-mail: yunbing.li@ucalgary.ca

A Direct Argument from Counterfactual Skepticism to Future Skepticism

Abstract

Counterfactual skepticism is the view that most counterfactuals are false. The key principle in the argument of counterfactual skepticism is the Chance-Undermines-Would-Principle, which says that if had A obtained, and there would have been some chance of C not obtaining, then the counterfactual "if A had happened, then C would have happened" is false. In this paper, I present a direct argument from counterfactual skepticism to future skepticism, the view that we have very limited knowledge about the future. I also show that future skepticism is a logical consequence of counterfactual skepticism. Since my argument relies only on the Chance-Undermines-Would-Principle, compared with current arguments from counterfactual skepticism to future skepticism that rely on additional principles, my argument is direct.

Hájek famously (2014) argues that most counterfactuals are false. To illustrate his argument, suppose there is a dry match on the table, and it is never struck. The environment is dry enough, and there is little to no wind. In this case, the following counterfactual seems true:

(1) If the match had been struck, it would have been lit.

But the probability that the match would not light is non-zero after it has been struck. For instance, even though the probability is very small, a sudden gust of wind might still blow and prevent the match from lighting. This small probability is enough to make the following counterfactual true:

(2) If the match had been struck, it might not have been lit.

Nevertheless, the combination of (1) and (2) sounds odd:

(3) #If the match had been struck, it would have been lit, but if the match had been struck, it might not have been lit.

Supported by the infelicity of (3), it seems that there is a tension between counterfactual (1) and counterfactual (2). According to Hájek, although (1) seems true at first glance, it is in fact false because (2) is incontrovertibly true. What Hájek draws from arguments along these lines is that the truth of a counterfactual $A \Box\!\!\rightarrow C$ is incompatible with a non-zero probability of $\neg C$, had A been the case. That is, he endorses the following general principle:

(4) Chance-Undermines-Would-Principle: $A \Box\!\!\rightarrow ch(\neg C) \neq 0 \Rightarrow \neg(A \Box\!\!\rightarrow C)$

Given our chancy world, for any chancy counterfactual $A \Box\!\!\rightarrow C$, the probability of $\neg C$ given A is greater than 0. Therefore, if the Chance-Undermines-Would Principle holds, most counterfactuals are false because they are chancy.

One may be interested in the philosophical costs of counterfactual skepticism. In this paper, I will show that counterfactual skepticism directly leads to future skepticism, the view that we have very limited knowledge about the future. My argument proceeds in two steps. First, by presenting parallels between ordinary counterfactuals and knowledge claims with respect to data points that are crucial to arguments for the Chance-Undermines-Would-Principle, I argue that if we accept the Chance-Undermines-Would-Principle, we should also accept that knowing a contingent future fact is incompatible with a non-zero probability of that fact not occurring. This further leads to future skepticism, as it is always possible for a chancy future fact not to happen. And then, I will show that future skepticism is a logical consequence of Chance-Undermines-Would-Principle, and thus a logical consequence of counterfactual skepticism.

My argument differs from current arguments from counterfactual skepticism to future skepticism[1] in that my argument only relies on the Chance-Undermines-Would-Principle, no other principles are needed. While current argument relies on the Qualitative Thesis, which says that if one knows A entails C but does not know A, then one knows that if A, then C.[2] Since no other principles are needed, my argument shows that future skepticism is a direct consequence of counterfactual skepticism.

Now let's start by presenting parallels between ordinary counterfactuals and knowledge claims with respect to data points that are crucial to arguments for the Chance-Undermines-Would-Principle. At the beginning of the paper, we have seen that the Chance-Undermines-Would-Principle is motivated by the seeming tension between the truth of a counterfactual $A \Box\!\!\rightarrow C$ and a non-zero probability of $\neg C$, had A been the case. Similarly, there is also a seeming tension between a knowledge claim "I know that C" and a non-zero probability of $\neg C$. For instance, just like (3), sentence (5) is also infelicitous, even if the probability of the match lighting is very high.

(5) #I know the match will light, but it might not light.

Based on the view that the infelicity of sentences like (3) indicates a conflict between the truth of the counterfactual $A \Box\!\!\rightarrow C$ and the probability of $\neg C$ being non-zero had A been the case, it seems to follow that the infelicity of (5) suggests a similar clash between knowing a chancy future fact and a non-zero probability of that fact not occurring. That is, if we accept the Chance-Undermines-Would-Principle, it seems that we should also accept the following principle:

(6) Chance-Undermines-Knowledge-Principle: $ch(\neg C) \neq 0 \Rightarrow \neg KC$
If the probability of $\neg C$ is non-zero, then one cannot know that C.

Since our world is so chancy, for any chancy future fact C, it is always possible for C not to happen. So if we accept the Chance-Undermines-Knowledge-Principle, then it follows that we have almost no knowledge about the future.

[1] See Boylan (2023).
[2] See Boylan (2022).

Some philosophers hold that the infelicity of (5) arises from pragmatics rather than from semantic contradiction. That is, uttering the sentence "the match might not light" requires that the possibility that the match will not light be compatible with the speaker's knowledge.[3] But this is inconsistent with the speaker's knowing that the match will light. For this reason, (5) is unassertable. And when we say that we know a chancy future fact, we typically do not consider very remote possibilities. Those remote possibilities can be ignored. In normal contexts, for a chancy future fact C, it is entirely possible for one to rule out all $\neg C$ possibilities except those that can be properly ignored. This is sufficient for the knowledge claim "one knows that C" to be true.[4] In (5), the knowledge claim "I know the match will light" may be true when the speaker's evidence eliminates all possibilities in which the match will not light except those that can be properly ignored. However, uttering the sentence "the match might not light" signals that there are possibilities in which the match will not light that are compatible with the speaker's knowledge and cannot be ignored. This is inconsistent with the speaker's knowing that the match will light. Hence, (5) is infelicitous.

Some philosophers hold instead that uttering "the match might not light" does not require that the possibility that the match will not light be compatible with one's knowledge, but requires only that this possibility be compatible with one's evidence. These philosophers argue that knowledge is not a subset of one's evidence, and that one can know C while one's evidence does not eliminate all relevant $\neg C$ possibilities. To explain the infelicity of (5), they appeal to maxim of quantity[5], i.e., one should make one's assertions as relevantly informative as one can. Then it follows that the reason why (5) is infelicitous is that "I know the match will light" conveys more information than "the match might not light." For instance, by uttering "I know the match will light," the speaker may convey that she is quite sure that the match will light, even though her evidence does not eliminate all possibilities in which the match will not light. This information is more informative than the information conveyed by the sentence "the match might not light." Therefore, if

[3]See Rysiew (2001). According to him, uttering it is possible that q requires that the speaker does not know q and does not know $\neg q$.

[4]See Lewis (1996).

[5]See Dougherty&Rysiew (2008).

one utters "the match might not light," one implies that one does not know the match will light. For this reason, one cannot say "I know the match will light, but it might not light."

Regardless of which of the above explanations we adopt, we can accept that we have knowledge about the future when we accept that (5) is infelicitous. However, if proponents of counterfactual skepticism were to accept these explanations, then the tension in (3) could be explained in a similar way, and the conclusion that most counterfactuals are false can be avoided. Thus, proponents of counterfactual skepticism would not accept these explanations. According to counterfactual skepticism, for any counterfactual $A \Box\!\!\rightarrow C$, if C is not entailed by A, then the probability of $\neg C$ is greater than zero had A been the case. Thus, the counterfactual $A \Diamond\!\!\rightarrow \neg C$ is always true, no matter how remote the $\neg C$ possibilities are. Because the truth of $A \Box\!\!\rightarrow C$ conflicts with the truth of $A \Diamond\!\!\rightarrow \neg C$, the counterfactual $A \Box\!\!\rightarrow C$ is always false. If proponents of counterfactual skepticism accepted that very remote possibilities can be properly ignored when evaluating truth, they would not conclude that $A \Diamond\!\!\rightarrow \neg C$ is always true. In an ordinary context, it is entirely possible to eliminate all $\neg C$ possibilities given A except for those remote possibilities that can be properly ignored, and in such a case $A \Box\!\!\rightarrow C$ is true. Hence, they would also not conclude that $A \Box\!\!\rightarrow C$ is always false. The infelicity of (3) could then be explained without taking If the match had been struck, it would have been lit" to be false. Since uttering If the match had been struck, it might not have been lit" implies that there are not-lighting possibilities that cannot be ignored given the antecedent, it is infelicitous in that context to say "If the match had been struck, it would have been lit."

Similarly, if proponents of counterfactual skepticism accepted that the infelicity of (5) can be explained by appealing to the maxim of quantity, they would also accept an analogous explanation for (3). That is, the counterfactual "If the match had been struck, it would have been lit" also conveys more information than the counterfactual "If the match had been struck, it might not have been lit." For example, by uttering "If the match had been struck, it would have been lit," the speaker communicates a high degree of confidence that the match lights when struck, despite being unable to eliminate all relevant possibilities where it does not. This communicated content is more informative than "If the match had been struck, it might not have been lit," since this might-counterfactual only conveys that it is possible for the match not to be lit after being struck. Uttering the might-counterfactual implies that the speaker cannot utter a more informative sentence, i.e., the counterfactual "If the match had been struck, it would have been lit." Thus, (3) is infelicitous. If proponents of counterfactual skepticism accept this explanation for the infelicity of (3), they need not conclude that all ordinary counterfactuals are false. Since we can explain the infelicity of (3) by appealing to the maxim of quantity, we do not need to conclude that there is a semantic contradiction in (3). It is entirely possible that (3) is true, and that both counterfactuals $A \Box\!\!\rightarrow C$ and $A \Diamond\!\!\rightarrow \neg C$ can be true at the same time.

So far, we have shown a parallel between the tension involving a would-counterfactual $A \Box\!\!\rightarrow C$ and a might-counterfactual $A \Diamond\!\!\rightarrow \neg C$, and the tension involving a knowledge claim that S knows that C and a might proposition that it might not be C. Interestingly, there is another parallel which is related to Hájek's objection to a view that conflicts with the Chance-Undermines-Would Principle. This view holds that for a counterfactual $A \Box\!\!\rightarrow C$ to be true, it suffices that the probability of C be sufficiently high had A been the case (let us call this view "high-chance-entail-would"). For instance, the counterfactual in (1) can be true when the probability of the match lighting after being struck is sufficiently high.

(1) If the match had been struck, it would have been lit.

Although high-chance-entail-would can well explain why ordinary counterfactuals seem to be true, Hájek argues that it leads to inconsistent results. To illustrate this, consider Hájek's example:[6]

(7) Suppose a coin is heavily biased towards the head. When tossed, the probability of it landing heads is 0.99. Consider the following counterfactuals:

   a. If the coin were flipped 1000 times, it would land heads on the first flip.
   b. If the coin were flipped 1000 times, it would land heads on the second flip.
   ⋮

[6]See Hájek (2014), p. 11.

c. If the coin were flipped 1000 times, it would land heads on the 1000th flip.

Suppose in (7), high-chance-entail-would predicts a counterfactual $A \square\!\!\rightarrow C$ to be true if the probability of C is greater than 0.9, had A been the case. Then it follows that all counterfactuals in (7) are true since the probability of the coin landing heads each time is 0.99. Naturally, the agglomeration of these counterfactuals should also be true:

(8) If the coin were flipped 1000 times, it would land heads every time.

But the probability that the coin would land heads on all 1000 tosses is approx 4.32×10^{-5}. So (8) is predicted to be false by high-chance-entail-would. Then there is a contradiction. Therefore, due to this inconsistency, high-chance-entail-would is not an effective objection to the Chance-Undermines-Would-Principle, and high chances do not prevent counterfactuals from falsehood.

Similar to Hájek's argument that high chances do not save counterfactuals from falsehood, if for a future knowledge claim "S knows that A" to be true, the probability of A only needs to be high enough (let's call this view "high-chance-entail-knowledge"), then we will also obtain an inconsistent result. To illustrate this point, consider the following scenario:

(9) Suppose a coin is heavily biased towards the head. When tossed, the probability of it landing heads is 0.99. I am informed that the coin will be tossed 1000 times. Suppose in this scenario, high-chance-entail-knowledge predicts the knowledge claim "I know that A" to be true when the probability of A is greater than 0.9. Then I know the following propositions:

a. The coin will land heads on the first flip.

b. The coin will land heads on the second flip.

$\vdots$

c. The coin will land heads on the 1000th flip.

Naturally, I should also know the conjunction of these propositions — that the coin will land heads every time. But due to the low probability of the coin landing heads on all 1000 tosses, the knowledge claim that I know this conjunction is predicted to be false by high-chance-entail-knowledge. Thus we arrive at a contradiction. So we obtain a conclusion similar to that of Hájek's argument: high chances do not save knowledge claims about chancy future facts from falsehood.

Moreover, Hájek holds that there are true counterfactuals like counterfactuals with a probabilistic consequent, since there is no tension between counterfactuals with a probabilistic consequent and might-counterfactuals.[7] For instance, the following sentence is felicitous:

(10) If the match had been struck, it would probably have been lit, but if the match had been struck, it might not have been lit.

Based on sentences like (10), we can see that a counterfactual with a probabilistic consequent "if A, then it would probably be that C" is not in tension with the might-counterfactual "If A, then it might not be C." Hájek argues that this is because counterfactuals with a probabilistic consequent merely express a possibility of their consequent. They are similar to might-counterfactuals. The counterfactual "if A, then it would probably be that C" is not in tension with the non-zero probability of $\neg C$ given A. So chances do not undermine counterfactuals with a probabilistic consequent, and these counterfactuals might be true. By contrast, since a counterfactual $A \Box\!\!\rightarrow C$ is in tension with a non-zero probability of $\neg C$ given A, this counterfactual is always false.

Similarly, it seems that probabilistic future knowledge claims are also compatible with might-sentences:

(11) I know the match will probably light, but it might not light.

Hence, following Hájek's argument that counterfactuals with a probabilistic consequent can

[7] See Hájek (2014), p. 72.

be true, since probabilistic future knowledge claims like “I know it will probably be that C” are compatible with might-sentences like “it might not be that C,” such probabilistic future knowledge claims may also be true. This is because “I know it will probably be that C” merely expresses a possibility of C compatible with my knowledge and is not in tension with the non-zero probability of $\neg C$. In contrast, since “I know that C” is in tension with “it might not be that C,” the knowledge claim “I know that C” is always false.

So far, we have shown three parallels between future knowledge claims and would-counterfactuals. The first parallel is between sentences like (3) and (5). Sentences like (3) motivate the Chance-Undermines-Would Principle. Analogously, from sentences like (5), we can derive the Chance-Undermines-Knowledge Principle. According to the Chance-Undermines-Knowledge Principle, since for almost any future event C the probability of it not occurring is non-zero, the knowledge claim “I know that C” is false. The second parallel is between the view high-chance-entail-would and the view high-chance-entail-knowledge. If we accept Hájek’s argument, then even if the probability of C given A is sufficiently high, as long as this probability is not equal to 1, the counterfactual “if A, then C” is false. By a line of reasoning parallel to Hájek’s, I show that even if the probability of a chancy future fact C is sufficiently high, as long as it is not equal to 1, the knowledge claim “I know that C” is also false. Since the probability of almost any future fact C not occurring is not equal to zero, the knowledge claim “I know that C” is false. The third parallel is between counterfactuals of the form “If A, then it would probably be that C” and knowledge claims of the form “I know that it will probably be that C.” Hájek argues that not all counterfactuals are false. In particular, counterfactuals with probabilistic consequents can be true, since the counterfactual “If A, then it would probably be that C” is compatible with a non-zero probability of $\neg C$ given A. Similarly, not all future knowledge claims are false. Knowledge claims such as “I know that it will probably be that C” may be true, since such knowledge claims are compatible with a non-zero probability of $\neg C$. Taken together, these three parallels show that just as a non-zero probability of $\neg C$ given A is what makes counterfactual “if A, then C” false, a non-zero probability of $\neg C$ also makes the knowledge claim “I know that C” false.

Building on the intuition that future skepticism is a natural consequence of the Chance-Undermines-Would-Principle, I now present an argument to show that future skepticism is in fact a logical consequence of this principle, and thus a logical consequence of counterfactual skepticism. Let's assume that knowing a chancy future fact A is compatible with $\neg A$ having a non-zero probability for reductio. Since knowing A entails the truth of A, the following two counterfactuals have nonvacuous antecedents, and clearly they are true because their antecedent entail their consequent:[8]

(12) $\quad A \wedge ch(\neg A) \neq 0 \mathrel{\Box\!\!\rightarrow} A$

(13) $\quad A \wedge ch(\neg A) \neq 0 \mathrel{\Box\!\!\rightarrow} ch(\neg A) \neq 0$

By the Chance-Undermines-Would-Principle, (13) entails the following counterfactual:

(14) $\quad \neg(A \wedge ch(\neg A) \neq 0 \mathrel{\Box\!\!\rightarrow} A)$

(14) directly contradicts (12). This contradiction indicates that knowing a contingent future fact A is incompatible with $\neg A$ having a non-zero probability if the Chance-Undermines-Would-Principle holds. Thus, we have to accept that we have very limited knowledge about the future, as the probability of any contingent future fact not occurring is always greater than zero. Therefore, future skepticism is a logical consequence of the Chance-Undermines-Would-Principle, and thus a logical consequence of counterfactual skepticism.

Some philosophers may argue that Chance-Undermines-Would-Principle only applies to a counterfactual whose consequent is not entailed by its antecedent. That is to say, if C is entailed by A, then we cannot infer $\neg(A \mathrel{\Box\!\!\rightarrow} C)$ from $A \mathrel{\Box\!\!\rightarrow} ch(\neg C) \neq 0$. In the above argument, since $A \wedge ch(\neg A) \neq 0$ entails A, we cannot derive $\neg(A \wedge ch(\neg A) \neq 0 \mathrel{\Box\!\!\rightarrow} A)$ from $A \wedge ch(\neg A) \neq 0 \mathrel{\Box\!\!\rightarrow} ch(\neg A) \neq 0$. So the inference from (13) to (14) is blocked. But I argue that the inference from (13) to (14) is as well motivated as the inference from $A \mathrel{\Box\!\!\rightarrow} ch(\neg C) \neq 0$ to $\neg(A \mathrel{\Box\!\!\rightarrow} C)$ when C is not entailed by A. According to Hájek,

[8] Proponents of counterfactual skepticism might deny that (12) and (13) are tautologies, and thus hold that (12) and (13) might be false. However, this move is unconvincing, since it is widely accepted and there is no good reason to reject that counterfactuals of the form "if A and B, then A" are tautologies.

the might-counterfactual recognizes $\neg C$ possibilities, while the would-counterfactual eliminates $\neg C$ possibilities.[9] So there is a semantic tension between $A \Box\!\!\rightarrow C$ and $A \Diamond\!\!\rightarrow \neg C$. Because a non-zero probability of $\neg C$ makes it true that it might $\neg C$, it follows that there is a semantic tension between $A \Box\!\!\rightarrow C$ and $A \Box\!\!\rightarrow ch(\neg C) \neq 0$. Similarly, if there is a non-zero probability of $\neg A$, then it might be $\neg A$. And then we can infer from $A \wedge ch(\neg A) \neq 0 \Box\!\!\rightarrow ch(\neg A) \neq 0$ to $A \wedge ch(\neg A) \neq 0 \Diamond\!\!\rightarrow \neg A$. Since $A \wedge ch(\neg A) \neq 0 \Diamond\!\!\rightarrow \neg A$ is inconsistent with $A \wedge ch(\neg A) \neq 0 \Box\!\!\rightarrow A$, we have that if $A \wedge ch(\neg A) \neq 0 \Box\!\!\rightarrow ch(\neg A) \neq 0$ is true, then $A \wedge ch(\neg A) \neq 0 \Box\!\!\rightarrow A$ is false.

To conclude, in this paper, I present a direct argument from counterfactual skepticism to future skepticism, which relies only on the Chance-Undermines-Would-Principle. And I also show that future skepticism is a logical consequence of counterfactual skepticism. Compared with existing arguments from counterfactual skepticism to future skepticism that rely on additional principles, my argument is direct because it relies only on the Chance-Undermines-Would-Principle.

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[9] See Hájek (2014), p. 23.