

# SUBJUNCTIVE CONDITIONALS ARE MATERIAL

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## ABSTRACT

The material account proposes that indicative conditionals are material, but it is widely believed that this account cannot be applied to subjunctive conditionals. There are three reasons for this consensus: (1) the concern that most subjunctive conditionals would be vacuously true if they were material, which seems implausible; (2) the inconsistency with Adams pair, which suggests that indicative and subjunctive conditionals have different truth conditions; and (3) the belief that the possible world theories are a superior alternative to the material account. In this paper, I will argue against (1) by showing that the counterintuitive aspects of vacuously true conditionals can be explained away in a consistent manner, regardless of whether they are indicative or subjunctive. I will support this argument by demonstrating that the positive arguments for the material account of indicatives also apply to subjunctives. I will counter (2) by explaining the Adams pair as logically equivalent conditionals that may be appropriate at different times, depending on the speaker's epistemic situation. Finally, I will challenge (3) by arguing that the possible world account faces insurmountable issues and that a comprehensive material account of both indicatives and subjunctives is ultimately a more elegant solution.

## 1. INTRODUCTION

A conditional sentence is a construction that comprises a subordinate clause, often introduced by the conjunction 'if', that specifies the condition necessary for the main clause to take effect. For instance, 'If it rains, there will be a flood in the city' and 'If it had rained, there would have been a flood in the city' are two examples of conditionals. The classification of conditional sentences is generally based on the grammatical mood of the verbs employed. An 'indicative' conditional is one where the verbs appear in the indicative mood, while a 'subjunctive' conditional uses verbs in the subjunctive mood. In the aforementioned examples, the first one is an indicative conditional, whereas the second is a subjunctive conditional<sup>1</sup>.

The material account of indicative conditionals posits that these sentences have the same truth conditions as the material conditional. Although elegant, it has some counterintuitive aspects. For example, it implies that any indicative conditional with a false antecedent or a true consequent is vacuously true. Despite these problems, the material account has many defenders who attempt to explain away its counterintuitive aspects. They suggest that these aspects result

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<sup>1</sup> I will make a distinction between indicative and subjunctive conditionals, instead of a distinction between indicative and counterfactuals because the latter terminology wrongly suggests that any indicative conditional with a false antecedent is a counterfactual, which would render the distinction between counterfactuals and indicatives pointless (Lowe, 1995: 42). Moreover, there are clear examples of conditionals with true antecedents which would be routinely classified as counterfactuals, e.g., 'I think she took arsenic; for she has symptoms X, Y, and Z, and these are just the symptoms she would have if she had taken arsenic' (Anderson, 1951: 37). The indicative vs subjunctives terminology is also not completely accurate since the 'subjunctive' in subjunctive conditionals involve additional layers of past tense morphology. The indicative 'If Roman is at the post office now, he is missing the meeting' becomes the subjunctive 'If Roman had been at the post office now, he would have been missing the meeting.' Thus, one could argue subjunctives could be called 'additional past conditionals' (von Stechow, 2012: 466–467). However, I will stick to the indicatives/subjunctives terminology because it is easier to grasp, it is already widely accepted and it reliably allows us to recognise visible grammatical features such as the use of 'would' in the main clause and a past tense in the 'if'-clause.

from the confusion between pragmatic elements in natural language and logical or semantic elements<sup>2</sup>.

One would expect that the material account would naturally extend to subjunctive conditionals. However, there is a consensus in the literature<sup>3</sup> that subjunctive conditionals cannot be material. Interestingly, even proponents of the material account express a skeptical attitude regarding this possibility<sup>4</sup>. In this paper, I will argue that this consensus is unfounded. In sections 2, 3, and 4, I will make the case that material theorists must adopt the material account of subjunctives for the sake of coherence. In section 5, I will argue that the examples that motivate the belief that indicative and subjunctive conditionals have different truth-conditions are not convincing. Finally, in section 6, I will argue that possible world theories have too many problems to be considered the default position on this subject and cannot be considered superior to the material account from the outset.

## 2. FOR THE SAKE OF COHERENCE

One of the main reasons that leads us to the prevailing idea that subjunctives are not material is that it does not do justice to our modal intuitions about subjunctive conditionals. Since the vast majority of subjunctive conditionals are asserted under the assumption that their antecedents are false, they would be vacuously true if they were material. This is implausible since many subjunctive conditionals with false antecedents seem false. In fact, two subjunctive conditionals can have false antecedents even if only one of them is intuitively true. For example, given the usual conditions and the fact that it was not raining, the conditional ‘If it were raining, the street would be wet’ is intuitively true, while the conditional ‘If it were raining, the planet Earth would be invaded by Martians’ is intuitively false. However, if we accept that subjunctives are material, we cannot make these distinctions, as both would be true solely due to the falsity of the antecedent.

It is important to note that this line of reasoning can be challenged using the same approach that proponents of the material account already use for indicatives with false antecedents. Although many indicatives have false antecedents, proponents of the material account would agree that: (1) those indicatives are vacuously true, (2) their counter-intuitive aspects can be explained pragmatically, and (3) their abundance is irrelevant. If these responses are reasonable for indicatives, they should also hold for subjunctives, even if most of them are vacuously true. The fact that there are even more vacuously true subjunctives than indicatives does not affect the strength of the argument.

In fact, item (2)—the attempt by proponents of the material account to explain the counter-intuitive aspects of indicatives pragmatically—makes a material account of subjunctives necessary to maintain coherence. All the intuitions that motivate the belief that subjunctives are not material are the same as those that motivate the belief that indicatives are not material.

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<sup>2</sup> See Ajdukiewicz (1956), Allott & Uchida (2009a; 2009b), Breul, (2022), Clark (1971), Hanson (1991), Lewis (1976), Grice (1989), Jackson (1987, 2006), Mellor (1993), Noh (1998); Rieger (2006; 2015); Smith (1983); Smith & Smith (1988); Williamson (2020).

<sup>3</sup> To my knowledge, the only exception is Strawson (1986: 229) who argues that the “view that ‘if . . . then . . . ’ is identical in conventional force with ‘. . .  $\supset$  . . . ’ is sometimes accompanied by reservations about counterfactual conditionals. But if it is to be attractive, I think it will have to be forced through for counterfactuals as well”. But since he is a critic of formal logic, this can’t be considered an endorsement from a material account enthusiast. The other apparent exception is Williamson (2020), who claims that subjunctive conditionals are material, but interprets them as context-dependent strict conditionals. This stance does not qualify as a material account of subjunctives tout court.

<sup>4</sup> This is evidenced by the fact that the enthusiasts of the material account who have a properly argued position about the distinction between indicative and subjunctive conditionals, defend a distinctive approach to analyse subjunctive conditionals. For example, Lewis (1973) and Jackson (1987: 72–85) endorse a possible world approach for subjunctives, while Rieger (2017) accepts a quinean stance that is more unsympathetic to subjunctives.

For example, a subjunctive such as ‘If today were Thursday, the Martians would invade our planet’ is vacuously true according to the material account if the antecedent is false, but its counter-intuitiveness can be explained in the same way as with indicatives. Paul Grice (1989) could explain the counter-intuitive aspect of this subjunctive by stating that the conditional is inappropriate in a conversation since it implies that the speaker has indirect or non-truth-functional evidence for the proposition asserted. Since someone would only assert this subjunctive because its antecedent is false, they would imply a false implicature, which would be inappropriate for conversation. Therefore, the subjunctive conditional is counter-intuitive because it is not appropriate for conversation.

Frank Jackson (1987) tried a different approach, which can also be applied to subjunctives. He argued that the assertion of a conditional conveys a conventional implicature that the probability of the consequent given that the antecedent is true is high. In this case, this means that by asserting a subjunctive conditional, the speaker implicates that the conditional is robust in relation to its antecedent, i.e., that the conditional could be employed on a modus ponens. The subjunctive conditional only seems false because it is accompanied by a false implicature. If it turns out that I am wrong about today’s date, and it is Thursday, I would not conclude by modus ponens that the Martians will invade our planet. Rather, I would abandon the conditional. The fact that the conditional is a subjunctive does not change the rationale behind the explanation.

My favourite account explains the counter-intuitive character of the example as a result of a contextual fallacy<sup>5</sup>. The relevant conditions to evaluate the truth-value of a conditional involve the actual truth-values of the antecedent and the consequent. If the antecedent is false, the conditional is vacuously true. Our intuitive understanding tends to ignore this basic fact because it evaluates the truth-value of the conditional based on a possible circumstance in which the antecedent is true, even if the antecedent is false. This is a contextual fallacy because to determine the truth-value of a conditional the intuitive understanding ignores the actual truth-values of its components. If the modal intuition is unjustified when the subject matter is indicative conditionals, there are no reasons to accept it when the subject matter is subjunctive conditionals.

The only explanation that deviates from this pattern is the one provided by Adam Rieger (2006; 2015). He argued that for  $A \rightarrow B$ <sup>6</sup> to be conversationally appropriate, the following conditions must be met:

- I.  $S$  knows  $A \supset B$
- II.  $S$  does not know  $A$ , and does not know  $\neg A$
- III.  $S$  does not know  $B$ , and does not know  $\neg B$ .

The first condition observes the requirement that knowledge is a norm of assertion. The second and the third are motivated by the idea that we ordinarily assert  $A \rightarrow B$  only if the truth-values of  $A$  and  $B$  are epistemically open (Rieger, 2006: 234). Now, with this explanation we could explain why some indicatives are counter-intuitive, e.g., ‘If today is Thursday, the Martians will invade our planet’. The problem, though, is that this solution would imply that most subjunctive conditionals are inappropriately asserted since they usually involve the knowledge that  $A$  is false and so is  $B$ . Thus, not only counter-intuitive subjunctives but also intuitive ones

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<sup>5</sup> See Allott & Uchida (2009a; 2009b) and Chakraborti (1998: 498–501).

<sup>6</sup> Here ‘ $\rightarrow$ ’ stands for indicative conditionals, ‘ $\supset$ ’ stands for material conditional and ‘ $\models$ ’ stands for entailment. All argumentative forms and metalogical principles discussed will be initially named, and from then on will be referred by their respective abbreviations. Some of the known argumentative forms will be introduced only by their names and their logical form will not be introduced. For simplicity of exposition, I will use the same numeration (1,2,3...) for each positive argument and the capital letters  $A, B, C, \dots$  for both sentence letters and propositional variables—the context will make it clear which one is being used. I will not use quotes to highlight the use-mention distinction when there is no risk of confusion, and the symbols and variables quoted will be modified to ensure that the notation remains uniform.

such as ‘If today were Thursday, tomorrow would be Friday’, would be rendered inappropriate. Therefore, this solution cannot be extended to subjunctive conditionals.

The first condition states that knowledge is a norm of assertion. The second and third conditions stem from the notion that we usually assert  $A \rightarrow B$  only if the truth-values of  $A$  and  $B$  are unknown (Rieger, 2006: 234). This can explain why some indicatives are counterintuitive, such as ‘If today is Thursday, the Martians will invade our planet’. While Rieger’s solution to counter-intuitive conditionals is elegant, it is not without its limitations. This solution implies that most subjunctive conditionals are inappropriately asserted since they usually involve the knowledge that both  $A$  and  $B$  are false. Thus, not only counterintuitive subjunctives but also intuitive ones, such as ‘If today were Thursday, tomorrow would be Friday’, would be rendered inappropriate. Therefore, this solution cannot be extended to subjunctive conditionals.

I believe that this approach’s limitations are a consequence of more basic problems. Rieger’s solution appears to provide conditions for asserting conditionals only based on regular ‘if  $A$ ,  $B$ ’ constructions. Such constructions imply that the speaker is uncertain about the truth-values of  $A$  and  $B$ , making it natural to assume that they should not assert the conditional otherwise. However, this reasoning gives too much weight to regular ‘if’ constructions, ignoring that the terms used in the subordinate clause of a conditional can vary based on different contexts and speaker assumptions. As we understand this fact, it becomes challenging to overlook examples that violate II and III. For instance, a conditional such as ‘Since she got late to the airport, she lost the airplane’ is conversationally appropriate, even though the speaker asserts the conditional with the assumption that both the antecedent and the consequent are true. This is because the speaker uses terms that adequately express their knowledge of the truth-value of the constituents involved. Other suitable terms ‘Given that  $A$ ,  $B$ ’, ‘ $B$ , because  $A$ ’, ‘When  $A$ ,  $B$ ’, ‘Despite  $A$ ,  $B$ ’, etc<sup>7</sup>.

But this solution also faces counterexamples with regular ‘ifs’ in contexts where it is implicitly obvious to interlocutors what the speaker’s assumptions are. In these cases, the regular ‘if’ does not need to be flexed according to the speaker’s assumptions. Consider Dutchman conditionals such as ‘If John is a great artist, I’m Einstein.’ These conditionals are asserted under the assumption that both the antecedent and the consequent are false, but are perfectly appropriate. Rieger’s solution also faces problems in trying to explain the following conditional: ‘If Messi waits just a second longer, he scores on that play.’ (von Fintel, 2012: 467). Conditionals of this sort are common in sportscast play-by-play commentary but are appropriate even if the speaker already knows that both antecedent and consequent are false.

Other circumstances that will potentially be problematic for Rieger’s solution are lectures. Suppose that in a lecture on Kripke’s thesis about the necessity of identity, a teacher asserts the following conditional: ‘If water is H<sub>2</sub>O, then it is necessarily H<sub>2</sub>O.’ He asserts the conditional knowing the truth-values of the antecedent and consequent of the conditional, but he is not being inappropriate in any way. Or consider a mathematics teacher who presents an informal proof that there are infinite prime numbers with two conditionals: ‘If there is an  $N$  which is the biggest prime number, there is a prime number bigger than  $N$ . If there is an  $N$  which is the biggest prime number, there is no prime number bigger than  $N$ . Therefore, there is no  $N$  which is the biggest prime number.’ The conditionals are asserted under the assumption that there is no  $N$  which is the biggest prime number, but they are appropriate. Also, notice that these

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<sup>7</sup>‘Even-ifs’ admit a similar explanation, although the term can signal different things about the speaker’s expectations in different contexts. In an example such as ‘Even if you offer me a huge pay rise, I shall resign’ it expresses the speaker’s belief that the consequent is true independent of the antecedent. However, the ‘even’ particle could be dispensed with altogether if the context is enough to understand the speaker’s beliefs, for instance, ‘If he was surprised, he didn’t show’ (Grice, 1989: 62). In some cases, ‘even’ can signal that the consequent is unexpected given the antecedent, such as ‘Even though she is older, she is still attractive.’ The verbal modifications characteristic of subjunctive conditionals admit a similar explanation since conditionals with the form ‘If  $A$  were/had been the case,  $B$  would be the case’ express the speaker’s belief that the antecedent and consequent of the conditional are false unless indicated otherwise by the context.

conditionals are part of a more general pattern in which two conditionals  $A \rightarrow B$  and  $A \rightarrow \neg B$  can be employed together in reductio arguments that show that  $A$  is false. None of these facts is compatible with Rieger's solution<sup>8</sup>.

One issue with the approach to assertability discussed is that it implies any conditional in a *modus ponens* or *modus tollens* inference is inappropriate. For example, the inference 'If you're late, you can't take the bus. You are late. Therefore, you can't take the bus' seems intuitively valid, but it would be ruled out by this approach. Rieger (2015: 254–255) argues that such examples are special cases that are to be expected in a Gricean approach, along with other examples like artificial conditionals based on a Bridge Convention ('If I have a red king, I also have a black king') and even-ifs (e.g., 'Even if you offer me a huge pay rise, I shall resign').

However, this seems like a cop-out to avoid the issue. If the requirements do not apply in these cases, why should they be treated as special cases rather than counterexamples? Shouldn't an instance of *modus ponens* be considered a basic use that should be predicted, rather than a special circumstance? Moreover, the other examples mentioned above suggest that these cases are not rare. If we apply the solution only to cases where the knowledge of the truth-values of  $A$  and  $B$  are relevant to the assertability of  $A \rightarrow B$ , then this is not a general theory of assertability, but a particular observation that only applies to these particular cases. A proper theory of assertability of conditionals should not be arbitrarily restricted to a few cases, but should be able to handle a wide range of examples and circumstances<sup>9</sup>.

Thus, the fact that this approach cannot be extended to subjunctives should not be seen as a problem, since it already makes too many wrong predictions with indicative conditionals to begin with. The notion that a theory of assertability for indicative conditionals cannot be extended to subjunctive conditionals is dubious and should be viewed skeptically. Verbal modifications, such as subjunctives, should not have such a significant impact on the rules of appropriate conversation, particularly when compared to disjunctions and conjunctions.

It is possible that the reason behind the strong resistance against the material account approach is due to the misleading suggestion of subjunctive conditionals that the speaker is contemplating a context where the antecedent is true. This may explain why critics of the material account make similar mistakes as those made by proponents of the material account when it comes to analyzing subjunctive conditionals.

### 3. THE POSITIVE ARGUMENTS

The positive arguments that imply the material account of indicative conditionals are also intuitively valid for subjunctive conditionals. Take an instance of (Or-to-If), which is intuitively valid for indicative conditionals, such as 'Either the butler is the killer or the

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<sup>8</sup> Other contexts that pose problems for this solution include guessing games and testimonies, but I will not discuss them further to avoid a lengthy digression.

<sup>9</sup> Rieger posits that his theoretical approach shares the same spirit as Grice's. However, Grice's solution establishes the assertion of a conditional based on the indirectness that it implies. In other words, the speaker believes that he has non-truth-functional evidence to support the conditional that is being asserted. Interestingly, having truth-functional evidence to support a conditional does not necessarily mean that there is no indirect evidence to support it as well. The truth-value of the propositional components of a conditional is not sufficient for its assertion, but rather the implicature of indirectness. If this implicature of indirectness is accurate, then the conditional is indeed assertable, regardless of the speaker's knowledge of the truth-values of its components. On the other hand, if the implicature of indirectness is false, then the conditional becomes unassertable, even if the speaker disregards the truth values of its components. It is clear why Grice's approach does not face the issues mentioned earlier. However, in certain contexts, such as the game of Bridge, 'even-if' or with Dutchman conditional examples, the evidence required is truth-functional rather than indirect. In other contexts, such as those involving conditionals in teaching or *modus ponens* instances, Grice's approach is not problematic since it does not convey a false implicature of indirectness. Rieger's stance can be more accurately categorized within the same lines as Ajdukiewicz's solution (1956).

gardener is the killer. Hence, if the butler is not the killer, the gardener is the killer' (Stalnaker, 1975: 269). This argumentative form implies the material account of indicatives as follows (Rieger, 2012: 6)<sup>10</sup>:

Prem	(1)	$\neg A \vee B \models A \rightarrow B$	(Or-to-If)
Prem	(2)	$A \supset B \equiv \neg A \vee B$	given the truth conditions of ' $\supset$ '
1,2	(3)	$A \supset B \models A \rightarrow B$	1,2 transitivity of entailment
Sup	(4)	$A \rightarrow B \models A \supset B$	given the validity of modus ponens for ' $\rightarrow$ '
1, 4	(5)	$A \rightarrow B \equiv A \supset B$	3,4 mutual entailment

It's interesting to note that similar examples are also applicable to subjunctive conditionals. For instance, consider the statements 'If any stranger had approached, the dog would have barked. Therefore, either no stranger approached or the dog would have barked' and 'If Napoleon were not a conqueror, he would have died young. Therefore, Napoleon would have either been a conqueror or died young.' (Anscombe, 1981: 203; 205).

Instances of *Exportation* (EXP), the argumentative principle that allow us to infer  $A \rightarrow (B \rightarrow C)$  from  $(A \& B) \rightarrow C$ , plausibly apply to indicative conditionals, as it is evidenced by the following example: 'If he is a man and he is married, then he is a husband. Therefore, if he is a man, then if he is married, he is a husband' (Leavitt, 1972: 10). We can show that conditionals are material assuming *ex contradictione quodlibet* (ECQ)  $A, \neg A \models B$ , conditional proof (CP), the meta-logical principle that states that if  $A \models B$ , then  $A \rightarrow B$  is a tautology and (EXP). The argument is as follows:

Prem	(1)	$A \& \neg A \models B$	(ECQ)
1	(2)	$(A \& \neg A) \rightarrow B$	1, (CP)
1	(3)	$\neg A \rightarrow (A \rightarrow B)$	2, (EXP)
1	(4)	$\neg A \models A \rightarrow B$	3, (CP)

(EXP) can also be used in a slightly different argument that employs (E&) instead of (ECQ):

Prem	(1)	$B \& A \models B$	(E&)
1	(2)	$\models (B \& A) \rightarrow B$	1, (CP)
1	(3)	$\models B \rightarrow (A \rightarrow B)$	2, (EXP)
1	(4)	$B \models A \rightarrow B$	3, (CP)

According to the material account, the validity of (EXP) for subjunctive conditionals would mean that subjunctives are material. This is supported by intuitive examples of (EXP) with subjunctives, like 'If Juan hadn't married Xochitl and Sylvia hadn't run off to India, Juan and Sylvia would have become lovers. Therefore, if Juan hadn't married Xochitl, then if Sylvia hadn't run off to India, Juan and Sylvia would have become lovers' (McGee, 1985: 466–467) and 'If John were in and Tom were out, Father'd be left alone. Thus, if John were in, then if Tom were out, Father'd be left alone.' (Anscombe, 1981: 203).

Another important argumentative form is (U-to-if), which is the principle that if every  $F$  is  $G$ , then  $Fa \rightarrow Ga$  (Rieger, 2013: 3166–7). This principle supports the material account because if the falsity of  $Fa \rightarrow Ga$  implies the falsity of every  $F$  is  $G$ , it must be because the antecedent is true and the consequent is false. Rieger gives an intuitive example of this principle: if everyone studying French is also studying German, and Anna is one of the students, then we can infer that if Anna is studying French, she is also studying German. We

<sup>10</sup> The argument is attributed to Stalnaker (1968: 269).

can apply a similar inference in the subjunctive mood: if Anna had studied French, she would have studied German.

Two of the previous arguments used (CP), which can also show that conditionals follow conditional negation (CN), meaning that  $A \rightarrow B$  is logically equivalent to  $\neg(A \& \neg B)$ . To derive (CN) using (CP), we also need (E&), (MP), (I&), and reduction to absurdity (I $\neg$ ) (Hanson, 1991: 54):

Prem	(1)	$A \rightarrow B$	
Sup	(2)	$A \& \neg B$	assumption
2	(3)	$A$	2, (E&)
1,2	(4)	$B$	1,3 (MP)
2	(5)	$\neg B$	2, (E&)
1,2	(6)	$B \& \neg B$	4,5 (I&)
1	(7)	$\neg(A \& \neg B)$	2–6, (I $\neg$ )

Prem	(1)	$\neg(A \& \neg B)$	
Sup	(2)	$A$	assumption
Sup	(3)	$\neg B$	assumption
2,3	(4)	$A \& \neg B$	2,3 (I&)
1,2,3	(5)	$\neg(A \& \neg B) \& (A \& \neg B)$	1,4 (I&)
1,2	(6)	$B$	3,5 (I $\neg$ )
1	(7)	$A \rightarrow B$	2,6 (CP)

The principle of Conditional Proof (CP) is valid whether the conditional is indicative or subjunctive. If  $A$  implies  $B$ , then it is a logical truth that if  $A$  is the case,  $B$  is the case (indicative) or that if  $A$  had been the case,  $B$  would have been the case (subjunctive). For example, if Socrates being Athenian implies that he is Greek, then ‘if Socrates is Athenian, he is Greek’ and ‘if Socrates were Athenian, he would have been Greek’ are both logically true. The grammatical mode of the conditional makes no difference from a semantic point of view. This also holds for Conditional Negation (CN). ‘If John were in, James would not’ is equivalent to ‘It is not the case that John would be in and James not.’ (Anscombe, 1981: 203).

Another important principle is *General Conditional Proof* (GCP), which states that if  $A$  and  $B$  imply  $C$ , then  $A$  implies  $B \rightarrow C$ . Rieger, correctly to my view, uses the following example to claim that this principle is intuitively valid: if having eggs and olive oil implies that one can make mayonnaise, then having eggs implies that if one has olive oil, they can make mayonnaise. This principle can be used to show that  $A \supset B$  and  $A \rightarrow B$  are logically equivalent. First, we need to show that  $A \rightarrow B$  entails  $A \supset B$ . This conclusion follows from the assumption that (MP) is valid for ‘ $\rightarrow$ ’. If the entailment of  $A \rightarrow B$  and  $A$  to  $B$  were to fail, there would be an  $A$  and a  $B$  for which  $A \rightarrow B$  is true, but  $A \supset B$  is false. But if  $A$  were true and  $B$  false, we would be able to infer by (MP) that for ‘ $\rightarrow$ ’ that  $B$  is true, which is a contradiction. Now we need to show that  $A \supset B$  entails  $A \rightarrow B$ . We know that  $A \supset B, A \vDash B$  since it is uncontroversial that (MP) is valid for ‘ $\supset$ ’. From (GCP) it follows that  $A \supset B \vDash A \rightarrow B$  (Rieger, 2013: 3163). Thus, GCP implies that conditionals are material. Interestingly, the intuitive instance of GCP involving indicative conditionals is also valid when the indicative conditional in the conclusion is replaced by a subjunctive conditional. For example, ‘If having eggs and olive oil entails that I can make mayonnaise, it follows that if I had olive oil, I could have made mayonnaise.’

These examples suggest that if the positive arguments imply that indicative conditionals are material, they also imply that subjunctive conditionals are material since the same fundamental principles are also valid for subjunctive conditionals. This reasoning, simple as it may be, is still met with resistance. Rieger (2013: 3164–5), for instance, argued that (GCP) fails for subjunctives since the evaluation of subjunctives involves a hypothetical assumption of the antecedent that represents an alternative pathway that events could have taken, thus putting at risk the background information necessary to make the inference.

Consider the intuitive instance of (GCP): if having eggs and olive oil entails that I can make mayonnaise, it follows that having eggs entails that if I have olive oil I can make mayonnaise. Rieger thinks that this inference will not work with a subjunctive conditional in the conclusion since the hypothetical assumption that I have olive oil may direct me to a scenario in which I may not have eggs, which is required to make mayonnaise. However, there is no context in which the premise, ‘I have eggs’ is true and the conclusion, ‘if I had olive oil, I could make mayonnaise,’ is false.

That would only occur if we change the context during the evaluation of the argument, but this is a contextual fallacy that can render any argumentative form invalid. It is a basic tenet of semantics that when evaluating arguments for validity, we need to maintain the context constant<sup>11</sup>. This tenet must be observed, as attested by the fact that a plausible instance of *modus ponens* will be rendered invalid by changing the context, e.g., ‘If it’s raining, the streets are wet. It’s raining. Therefore, the streets are wet.’ If the premises’ truth-values are evaluated on Wednesday and the conclusion on Thursday, the premises could be true and the conclusion false (Brogaard & Salerno, 2008: 40–41).

It is not surprising then that one of the main explanations for the counterexamples to *modus ponens* presented in the literature is that they result from an illicit context in the evaluation of the argument<sup>12</sup>. But there is no need to defend *modus ponens* to highlight the importance of holding the contextual features fixed. The same point can be made with uncontroversial argumentative forms such as conjunctive elimination. Consider the following example: ‘It’s raining and the streets are wet. Therefore, the streets are wet.’

This argumentative form could be said to be invalid if we evaluate the premise on Wednesday and the conclusion on Thursday. That won’t do. Thus, Rieger’s objection to (GCP) does not hold water. One could object that the examples above do not involve contextual shifts since the actual propositional content has temporal indexers. Thus, if the premise is intended to refer to streets on Wednesday, the premise should be interpreted as ‘It’s raining and the streets are wet on Wednesday,’ and this would entail ‘The streets are wet on Wednesday.’

The attempt to shift the context to make the conclusion false will be ineffective with this qualification since the truth-values of the propositions will not vary over time. Of course, to fully determine the proposition expressed by the sentences, we would need to expand it with other unarticulated constituents, e.g., what is the name of the street that was wet, in which city? It was raining on a Wednesday, but in which year and what was the local time? However, even a partial elucidation of the propositional content is enough to block any contextual shift.

After making a necessary qualification, there are no contextual shifts against (GCP). For instance, if the premise ‘I have eggs’ needs to be expanded to include its unarticulated constituents such as ‘I have eggs at time  $t$ , in place  $x$ ,’ then the conclusion would be ‘if I had olive oil at time  $t$ , in place  $x$ , I could make mayonnaise at time  $t$ , in place  $x$ .’ Hence, there would be no counterexamples to (GCP) with subjunctive conditionals.

Surprisingly, this platitude about the importance of maintaining context fixed also enables us to block the main counterexamples to the material account. The counterexamples to contraposition, strengthening of the antecedent, and hypothetical syllogism with both

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<sup>11</sup> See Allott & Uchida (2009a; 2009b); Brogaard & Salerno (2008); Gauker (2005: 94); Kaplan (1989).

<sup>12</sup> See McGee (1985), Lycan (1999), and Sinnott-Armstrong (1999).



indicative<sup>13</sup> and subjunctive<sup>14</sup> conditionals are usually perceived as indisputable proofs that the material account of both types of conditionals is false. They are not known as conditional fallacies for nothing. However, these counterexamples involving both types of conditionals are disarmed if the context is kept fixed<sup>15</sup>. Thus, the solution for Rieger’s objection against (GCP) contains the element for a powerful argument for the material account of both indicatives and subjunctives. Everything falls into place<sup>16</sup>.

#### 4. THE MATERIAL ACCOUNT MUST BE UNIFORM

A sound methodological principle is that a plausible logical system should explain closely related phenomena by the same fundamental principles (Ellis, 1984: 50–51). The material account satisfies this requirement with ease since it is a particular case of the same semantics used for other logic operators, such as disjunction, conjunction, and negation. Regardless of the operator, the truth-functional thinking remains the same.

The same logic applies whether the operator in question is in the indicative or subjunctive mood. While we may rarely find a free-standing conjunction with subjunctive clauses due to grammatical habits, they occur just as naturally as antecedents of conditionals, e.g., ‘If John were in and Tom were out, Father’d be alone’; or consequents, e.g., ‘If Father had made a will, Jim and Michael would have been disinherited’ (Anscombe, 1981: 206). Similarly, free-standing disjunctions with subjunctive clauses are rare, but they can occur naturally as consequents of conditionals, e.g., ‘If there were a meat shortage, then either prices would not be low or there’d be governmental control’ (Anscombe, 1981: 196). Moreover, notice that ‘If there were a meat shortage, then either prices would not be low or there’d be governmental control’ is intuitively equivalent to ‘If there were a meat shortage, then if meat prices were low there’d be governmental control’ (Anscombe, 1981: 196). This reinforces the material account for subjunctives since the disjunction in the consequent of the first proposition is logically equivalent to the conditional in the consequent of the second proposition. The first proposition has the logical form  $A \rightarrow (\neg B \vee C)$ , which is logically equivalent to  $A \rightarrow (B \rightarrow C)$  due to the application of (OTF).

One could object that (OTF) is not a valid argumentative form for subjunctive conditionals in alternatives to the material account. For instance, in a popular version of the possible world account,  $A \rightarrow B$  is only true if  $B$  is true in the closest  $A$ -world (Stalnaker, 1968: 102). However, from a disjunction such as ‘Oswald killed Kennedy or someone else did it’, we cannot infer ‘If Oswald had not killed Kennedy someone else would have’, for in the actual world the disjunction is true since Oswald killed Kennedy, but the conclusion is false since in the most

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<sup>13</sup> See Adams (1965); Bennett (2003).

<sup>14</sup> See Lewis (1973).

<sup>15</sup> See Allott & Uchida (2009a; 2009b); Chakraborti (1998: 498–501); Lycan (1999: 133–136). See also Brogaard & Salerno (2008); Lowe (1995: 56–57). The same strategy is also used in specific cases by different authors, for instance, Edgington (1995: 254) defends hypothetical syllogism for indicatives with this argument. Sinnott-Armstrong, Moor & Fogelin (1990: 10–14) articulate a similar defence of the validity of *modus tollens* for indicatives, while Sinnott-Armstrong (1999: 129) explains the counterexamples against strengthening of the antecedent and *modus ponens* for indicatives as contextual fallacies. McDermott (2004: 346–347) uses the same strategy in defence of strengthening the antecedent for subjunctives, and Read (1992: 7) accepts a similar explanation for one particular counterexample involving a classical inferential form with quantifiers.

<sup>16</sup> There is also a case to be made for a restricted material account of subjunctives as follows (this argument was presented by Nelson Goodman): From a subjunctive conditional such as ‘If that piece of butter had been heated at 150°, it would have melted’ it follows by contraposition an indicative conditional with a true antecedent and a true consequent, namely ‘Since that butter did not melt, it was not heated at 150°F’ (Goodman, 1947, p. 113–114). This is not a general argument for a material account of subjunctives since the subjunctive must have a false antecedent and a false consequent, and the corresponding indicative is a contrapositive but it places a restriction in any system that treats contraposition as valid. In classical logic, each counterfactual will have a corresponding indicative pair given the acceptance of contraposition.

similar world Oswald would not have killed Kennedy and no one else would have. It could be objected that the argumentative form involving subjunctives is intuitively valid if the disjunction is properly formulated in the subjunctive mode, namely, 'Either Oswald killed Kennedy or someone else would have', and from which it follows that 'If Oswald had not killed Kennedy someone else would have'. Additionally, it could be objected that the counterexample commits a contextual fallacy since the disjunction relies on the fact that Oswald killed Kennedy, but the conditional is evaluated in a context where Oswald did not kill Kennedy. The context is illicitly shifted because the truth-values of the disjunction are determined in the actual world, but the truth-values of the conditional are determined in the closest world in which the antecedent is true.

It is important to observe that these examples pose a problem for the possible world account, which receives significant intuitive support from subjunctive conditionals, particularly due to their subjunctive clauses. However, here we have instances of conjunctions and disjunctions with subjunctive clauses, and yet no one would argue that subjunctive conjunctions require a possible world semantics. If there are no compelling reasons to provide a possible world semantics as a fundamental principle for disjunctions or conjunctions, then there are no compelling reasons to provide the same semantics for conditionals.

The fact that the possible world account treats conditionals as a *sui generis* operator should be considered a hindrance. A similar objection could be raised against conditional-assertion theorists, who claim that conditionals are not propositions, but rather conditional assertions of the consequent given the assumption of the antecedent<sup>17</sup>. It does not seem likely that only conditionals among the logical operators would lack truth values. If there are no reasons to think that logical operators such as 'or' or 'and' should have different truth conditions in different grammatical moods, why should 'if' be any different? The idea that a verbal modification should require an entirely different logic reflects the excessive importance attributed to certain intuitions regarding 'if'. A full-fledged material account that incorporates both indicative and subjunctive conditionals has none of these problems and ensures that our logical principles are uniform by providing the same truth conditions for 'and', 'not', 'or', and 'if'.

If possible world theories do not offer a uniform explanation of closely related phenomena, conditional-assertion theories do it even less, as they treat conditionals as conditional assertion acts instead of propositions with truth conditions. This implies, among other things, that conditionals cannot be embedded. Lewis (1976: 305) objects that this consequence would require too much work and disregards the knowledge we already have about the phenomena:

I have no conclusive objection to the hypothesis that indicative conditionals are non-truth-valued sentences .... I have an inconclusive objection, however: the hypothesis requires too much of a fresh start. It burdens us with too much work still to be done, and wastes too much that has been done already. ... We think we know how the truth conditions for compound sentences of various kinds are determined by the truth conditions of constituent subsentences, but this knowledge would be useless if any of those subsentences lacked truth conditions. Either we need new semantic rules for many familiar connectives and operators when applied to indicative conditionals—perhaps rules of truth, perhaps special rules of assertability like the rule for conditionals themselves—or else we need to explain away all seeming examples of compound sentences with conditional constituents.

It is implausible that only conditionals among the connectives should not be embeddable. It is a drastic revisionary hypothesis that goes against our understanding of closely related

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<sup>17</sup> See, for example, Appiah (1985); Edgington (1986, 1995), Barker (1995), Woods (1997); DeRose (1999), and DeRose & Grandy (1999).

phenomena. The same can be said about the claim that conditionals lack truth-conditions. It seems like a drastic hypothesis that goes against the way we explain the semantics of logic operators. If the operators ‘or’, ‘and’ and ‘not’ have truth-conditions, why should conditionals be singled out as an exceptional case? This hypothesis only works by isolating conditionals from other connectives, and inferences with disjunction and conjunction are severed, leaving us with half-truth-functional logic (‘not’, ‘or’, ‘and’) and half-revisionary semantics. The material account, on the other hand, remains uniform. It does not ‘waste what we know’ about the other operators, and it is closely related to its connective partners. If conjunctions and disjunctions are truth-functions of two propositions, so are conditionals. The semantics must be an account universally applicable to every connective. Treating conditionals as *sui generis* operators is a step backwards compared to truth-functional thinking. We need a uniform account of connectives, and the only way to achieve that is by accepting a full-fledged material account that includes both indicatives and subjunctives.

## 5. THE APARTHEID THESIS

One reason to think that the material account cannot be extended to subjunctives is the belief that indicative and subjunctive conditionals have different truth conditions, known as the Apartheid thesis. This thesis is supported by the widely held view that indicative conditionals concern how things are, while subjunctive conditionals concern alternative ways things could have been. In other words, indicative conditionals are about the actual world, while subjunctive conditionals are about other possible worlds. Jackson (1987: 74–75) argues for this view with the following example. Suppose that the weather is nice and there are no signs of rain, but we know that the match will be cancelled if it rains and it won’t be cancelled if it doesn’t rain. Further, suppose you believe that it won’t rain and the match will happen. Given these assumptions, consider the following pair of conditionals:

- (1) If it rains, things will be different from the way they will actually be.
- (2) If it were to rain, things would be different from the way they will actually be.

But while (2) seems acceptable, (1) is odd. Rather, one should have said that ‘If it rains, things will be as they actually will be’. Jackson reasons that this example not only shows that indicatives and subjunctives have different truth conditions, but also that subjunctives can take us from the actual world.

Here are a couple of things in reply. First, it could be argued that the real pair of (1) is not (2), but (2’):

- (2’) If it were to rain, things would be different from the way things actually would have been.

(2’) is just as counter-intuitive as (1), because the use of the auxiliaries ‘will’ and ‘would’ do not express the speaker’s beliefs adequately, while (2) is intuitive for the opposite reason. Jackson ignores this point because he changes the mood of the other auxiliaries—he introduces ‘were’ in the antecedent and replaces ‘will’ with ‘would’, while maintaining the indicative mood of the auxiliary that accompanies the actuality clause. However, a similar trick could be used to modify (1) into a proper sentence (1’):

- (1’) If it rains, things will be different from the way they would actually be.

This sentence could be interpreted as stating that if it rains, things will be different from the way the speaker thought they would actually be, which is perfectly reasonable.

It could also be objected that because the use of the auxiliaries does not properly express the speaker's beliefs, (1) shouldn't be deemed as apparently false, but ungrammatical. The recognition that an indicative sentence is poorly formed just shows that its formulation is inadequate. It doesn't have logical relevance.

Another recurrent argument for the Apartheid thesis is the Adams pair:

(1a) If Oswald did not kill Kennedy, someone else did.

(2a) If Oswald had not killed Kennedy, someone else would have.

Intuitively, these conditionals have different truth conditions. After all, to accept (1a) is enough to know that Kennedy was killed by someone, but to accept (2a) is necessary to assume a conspiracy theory regarding its murder (Lewis, 1973: 3)<sup>18</sup>.

These arguments, however, face many objections. Arguably, the example of Kennedy's killer is only plausible if we confuse the truth conditions of conditionals with the reasons that were used to accept them. The reasons to accept an indicative conditional and its subjunctive version can be distinct even if they have the same truth conditions. Suppose that Fred and Mark have different reasons to think that John went to the bookstore on Wednesday afternoon. Fred thinks that John went to the bookstore because he knows that John goes to the bookstore every Wednesday afternoon. Mark thinks that John went to the bookstore because he suspects that John has an affair with a client who goes to the bookstore every Wednesday afternoon. These reasons do not affect the conditions in which the proposition 'John went to the bookstore Wednesday afternoon' is true or false. We should not confuse our claims about what is unacceptable or acceptable with claims about what is true, since the first relies on the evidence available to the epistemic agent about the proposition, but the second relies on the truth conditions of the proposition at hand. To think otherwise would amount to a confusion between epistemic and semantic phenomena.

However, one could object that it is precisely because the truth conditions cannot be determined by epistemic elements that we should expect that the subjunctive conditional of the pair could be accepted for the same reasons as its indicative version. Nevertheless, this is not what happens, since in every possible circumstance the subjunctive 'If Oswald had not killed Kennedy, someone else would have' is only plausible given the acceptance of a conspiracy theory.

One way to placate this criticism is to observe that (1a) and (2a) only seem to have different truth conditions if we disregard the contextual assumptions in which they should be evaluated. If both are evaluated under the same assumptions, they will have the same truth conditions. It is not difficult to imagine a context in which (1a) and (2a) would be acceptable under the same conspiracy theory. The only difference between the two is that (2a) would be asserted given the assumption that Oswald was the killer, while (1a) would be more appropriate to assert if Oswald were the main suspect. The problem, however, is to imagine a plausible context in which (1a) and (2a) can be interpreted as involving only the assumptions that Kennedy was killed by someone and that Oswald is the main suspect. (2a) resists this interpretation, since it seems to involve two assumptions, i.e., that Kennedy was killed by Oswald and that he would be killed even if Oswald was not the killer.

These arguments face objections. The example of Kennedy's killer may only be plausible if we confuse the reasons for accepting indicative and subjunctive conditionals with their truth conditions. Even if the reasons for accepting them are distinct, their truth conditions can be the same. For instance, Fred and Mark may have different reasons to believe that John went to the

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<sup>18</sup> This example is a modification of the original example presented by Adams (1970: 90). Hence the name 'Adams pair'.

bookstore on Wednesday afternoon, but their reasons do not affect the truth conditions of the proposition 'John went to the bookstore Wednesday afternoon.' We should not confuse what is acceptable or unacceptable with what is true or false, as the former depends on the available evidence to the epistemic agent, while the latter depends on the truth conditions of the proposition.

One could object that it is precisely because the truth conditions cannot be determined by epistemic elements that the subjunctive conditional of the pair could be accepted for the same reasons as its indicative version. Nevertheless, the subjunctive 'If Oswald had not killed Kennedy, someone else would have' is only plausible given the acceptance of a conspiracy theory in every possible circumstance.

One way to address this criticism is to note that (1a) and (2a) only seem to have different truth conditions if we ignore the contextual assumptions in which they should be evaluated. If evaluated under the same assumptions, they will have the same truth conditions. It is not difficult to imagine a context in which (1a) and (2a) would be acceptable under the same conspiracy theory. The difference between the two is that (2a) would be asserted under the assumption that Oswald was the killer, while (1a) would be more appropriate if Oswald were the main suspect. The challenge is to imagine a plausible context in which (1a) and (2a) involve only the assumptions that Kennedy was killed by someone and that Oswald is the main suspect. (2a) resists this interpretation because it appears to involve two assumptions: that Kennedy was killed by Oswald and that he would be killed even if Oswald was not the killer.

The reason why (1a) and (2a) are not accepted as equivalent by some is that the antecedent of (2a) assumes Oswald did not kill Kennedy, which is considered false, whereas (1a) does not. But we can cancel this assumption and see that both (1a) and (2a) admit the same non-conspiratorial interpretation. For instance, 'If Oswald didn't kill Kennedy, someone else did. In fact, this was precisely what happened. He was killed by another person.' and 'If Oswald had not killed Kennedy, someone else would have. In fact, that was exactly what happened. He was killed by another person.' In this case, both propositions admit the same interpretation that involves the perpetrator of the crime. This answer, however, does not eliminate the problem, since it makes the non-conspiratorial interpretation of (2a) acceptable only if the antecedent and the consequent were taken as true, i.e., only if under the assumption that someone different from Oswald killed Kennedy. (1a) admits a non-conspiratorial interpretation even if we haven't yet decided about the identity of Kennedy's assassin.

One way to bypass this difficulty is to maintain that we have the right to ignore as illusory the interpretation that the antecedent of (2a) is considered false when we are considering both conditionals under the same contextual assumptions. If this looks strange, it is because it contradicts our linguistic habits. This strategy, however, is inadequate. If the truth conditions of conditionals are independent of speakers' contextual assumptions, the idea that we should maintain the contextual assumptions unchanged to maintain the equivalence between (1a) and (2a) is mistaken.

Alternatively, we could incorporate the contextual assumptions implicit in each conditional in their propositional content. For example, if (1a) involves only the assumptions that Kennedy was killed by someone and that Oswald is the main suspect, then (2a) should involve the same assumptions. Thus, (2a) could be interpreted as (2a)\* 'If Oswald wasn't the one who killed Kennedy, then someone else was'. In this case, (2a)\* would be the corresponding pair of (1a) rather than (2a). (Fogelin, 1998: 288). This strategy seems plausible but faces some difficulties. Consider the following conditional:

(3a) If Oswald does not kill Kennedy, someone else will.

If (1a) is logically equivalent to (2a), then so is (3a). However, it is not obvious how an attribution of identity could fit in accordance with (3a). The conspiracy reading seems natural in this case, but not the attribution of identity reading. In fact, (3a) involves a slightly different assumption from (2a) since (2a) requires a conspiracy reading and the assumption that Oswald

killed Kennedy, while (3a) requires only the conspiracy reading. Besides, this solution blurs the distinction between speakers' contextual assumptions involved in the acceptance of (1a) and (2a) and the propositional content of (1a) and (2a).

Lowe (1979: 140) used a similar approach but argued that (1a) is poorly formulated, and not (2a). More precisely, he argued that the real pair of (2a) is another indicative with an auxiliary verb 'will', namely, 'If Oswald has not killed Kennedy, then someone else will have'. Since both have the same consequent directed towards the future, and both are acceptable or not in the same circumstances, the problem would be solved. But this solution only postpones the problem, for it raises the question of what would be the subjunctive corresponding to the indicative without the auxiliary. If (1a) has no subjunctive pair, an explanation for this absence must be provided. In a similar line of reasoning, Ellis (1984: 54) argued that the real indicative pair of (2a) is (3a), but this raises the question of why there are no proper subjunctive pairs of (1a). This solution could not be successful unless this explanation is provided, and it does not seem likely that any such explanation could be provided.

I think these approaches are not in the right direction because they neglect the main issue, namely, that (1a), (2a), and (3a) are made true by the same event, i.e., Kennedy's murder, regardless of whether or not there is a conspiracy. In fact, it is arguable that both conditionals are just different ways of referring to the same facts but can be appropriate in different moments depending on the speaker's epistemic situation. For instance, an indicative conditional asserted today such as 'If it rains tomorrow, the match will be canceled' is intuitively equivalent to a subjunctive conditional asserted tomorrow about the same event, i.e., 'If it had rained, the match would be canceled' (Adams, 1975: 103). The same explanation holds for Kennedy's killer conditionals. The indicative 'If Oswald didn't kill Kennedy, someone else did' and the subjunctive 'If Oswald had not killed Kennedy, someone else would have' are both typically asserted in different moments, even if they have the same truth conditions. Thus, the only difference is that each grammatical mode is appropriate at different moments. The reason why (2a) only admits a conspiracy reading is that it reflects this assumption.

However, these differences lack logical significance because the connection between indicative and subjunctive conditionals follows from a broader principle regarding truth-value links. This principle asserts that a proposition expressed as 'An event of the type K is occurring' when stated in the present has the same truth conditions as the proposition expressed as 'An event of the type K occurred one year ago' when stated one year later (Dummett, 2004: 75). There are independent justifications for this principle, which are elucidated when examining non-conditional propositions, for instance:

(1b) Someone killed Kennedy on November 22, 1963.

(2b) Someone would kill Kennedy on November 22, 1963.

The reason to accept (1b) may be the news that Kennedy was killed on November 22, 1963, while the reason to accept (2b) could be the belief that someone would assassinate Kennedy on that day. Nevertheless, it is implausible to think that the truth conditions of (1b) differ from those of (2b) since both are made true by the occurrence of the same event: the killing of J. F. Kennedy in Dallas on November 22, 1963.

The distinct modes and tenses of conditionals express the speaker's epistemic situation rather than the truth conditions of the conditionals themselves. Thus, it is not only the case that (1a)-(2a) are logically equivalent, but also that (3a) can be logically equivalent.

(1a) If Oswald didn't kill Kennedy, someone else did.

(2a) If Oswald had not killed Kennedy, someone else would have.

(3a) If Oswald doesn't kill Kennedy, someone else will.

The propositional constituents of each conditional are more complex than those presented in (1a)-(3a), as they involve specific contextual elements. If these contextual elements are included in the formulation, we obtain a conditional that is independent of the speaker's epistemic situation:

(4a) If Oswald is not Kennedy's killer on November 22, 1963, someone else is Kennedy's killer on November 22, 1963.

The propositional constituents of each conditional are more complex than those presented in (1a)-(3a), as they involve specific contextual elements. If we include these elements in their formulation, we obtain a conditional that is independent of the speaker's epistemic situation. This suggests that the truth conditions of conditionals are independent of their grammatical modes (indicative and subjunctive), as well as the different expressions employed in the antecedent and consequent, and their auxiliaries ('if', 'had', 'were', 'will', 'would', etc.), since these are just extra-propositional constituents used to express the speaker's assumptions during the assertion. The Kennedy examples appear logically different only because we are led by these grammatical elements to confuse the speaker's assumptions (an epistemic element) with the truth conditions of a conditional (a semantic element).

The role of these extra-propositional constituents in expressing the speaker's assumptions becomes evident when we compare their use in questions. Suppose someone asks the question: 'John did not go, did he?' We can infer from this question that they believe that John did not go. On the other hand, if the question is asked in a slightly different way, 'Surely John went, didn't he?', then we can infer that they believe that John did go. If John did go, the correct answer to both questions is 'yes', even if the first question was asked with the expectation that the answer would be 'no', while if he did not go, the correct answer to both questions will be 'no', even if the second question expects a 'yes' as the answer.

Similarly, suppose we are considering John's chances in a competition. The assertion of 'If he entered, he won' is equivalent to 'If he enters, he will win' and 'If he had entered, he would have won'. The only difference is that the last assertion suggests that the speaker thinks that John did not enter. However, this does not imply that the subjunctive version demands a different logical treatment, for the same reasons that the different suggestions associated with the two versions of the same question do not require a distinct logical treatment (Ayers, 1965: 353).

This link of truth-values is also supported by the way we employ indirect discourse about indicative conditionals. For instance, about the conditional 'the meetings will be held indoors if it rains', someone could say, 'he said that the meetings would be held indoors if it rained' (Adams, 1975: 103). We do not think that the indicative conditional has a different truth condition when reported as a subjunctive conditional by another person. Rather, it would make more sense to think that the subjunctive just reflects the speaker's epistemic situation regarding the conditional.

Despite its plausibility, this explanation faces criticism. The argument that (1a)-(3a) express the same conditional in distinct moments presupposes that the moments must be the ones suggested by the argumentation. Specifically, (1a)-(2a) are both asserted after the murder, while (3a) must be asserted before the murder. However, it is arguable that they can be asserted in distinct moments since conditionals can have different temporal directions. For instance, a subjunctive conditional can be about the present (e.g., 'If Her Majesty were here now, she would be revolted') or about the future (e.g., 'If the auditors come tomorrow, they will find everything in order') (Dudman, 1984: 146). These examples show that we cannot determine the epistemic situation of the speaker from the tense or the grammatical mode of the conditional sentence alone.

In response to this objection, we could observe that despite the temporal flexibility of indicative and subjunctive conditionals in general, in the examples mentioned we have restrictions that justify our interpretation. Specifically, (1a) and (2a) can only be plausibly

interpreted as being about a moment in the past before the killing took place, while (3a) can only be plausibly interpreted as referring to the same event in the future and before any killing had taken place. In any case, even if both had plausible alternative interpretations of (1a)-(3a), this would not affect the argumentation. All we need is to maintain that (1a)-(3a) are logically equivalent, even if they can assume different grammatical modes when they are asserted in distinct moments. If due to the temporal flexibility of conditionals, the sentences (1a)-(3a) could be plausibly asserted in the same moment, but with distinct grammatical modes, this would only reinforce the idea that they are logically equivalent.

Another objection involves some possible reasons to accept (3a). Suppose that (1a) and (3a) are equivalent, but appropriate in distinct moments. This temporal thesis also implies that the proposition 'Someone will kill Kennedy' is logically indiscernible from 'Someone killed Kennedy,' being the only difference between the two propositions that the first says about the future what the last says about the past. However, a conspirator could accept that Oswald plans to kill Kennedy without any help from a second killer, thus accepting 'Someone will murder Kennedy' but without accepting (3a) (Dudman, 2000: 147).

To answer this objection, it is important to observe first that the assumption of the conspirator is not just that someone will kill Kennedy, but the more specific assumption that Oswald will kill Kennedy. In this case, the conspirator refuses to accept that 'If Oswald does not kill Kennedy, someone else will kill him' from the assumption that 'Oswald will kill Kennedy.' This resistance, however, involves a refusal of the material account, i.e., the conspirator doesn't accept that the conditional  $A \rightarrow B$  can be true simply because  $A$  is false.

There are various ways to address the contrary intuition presented. The conspirator believes that the conditional 'If Oswald does not kill Kennedy, someone else will kill him' is false because she assumes that if Kennedy were not killed by Oswald, then no one else would have killed him. However, this reasoning is incoherent because it assumes that Oswald is the only possible killer while simultaneously rejecting the conditional for considering a scenario where Oswald is not the killer. Moreover, it is arguable that the objection involves another incoherence since it acknowledges that (1a) is entailed by the falsity of the antecedent, i.e., by the fact that Oswald killed Kennedy or by the truth of the consequent, i.e., if Kennedy's killer was not Oswald. This argument is generally presented as evidence supporting the material account (Johnston, 1996: 100). Therefore, it would be inconsistent to accept this consequence but then insist that it conflicts with our pre-theoretical beliefs. This discussion suggests that the only way to maintain the coherence of our temporal intuitions is to accept the material account.

Another criticism of the thesis that indicative and subjunctive conditionals are appropriate in different contexts, depending on the speaker's epistemic situation, is that it conflicts with the way we use indirect discourse. For instance, suppose someone said (1d) 'I'm awake'. The indirect reference of (1d) would be (2d) 'X said that she was awake'. Now consider the following propositions:

- (1b) Someone killed Kennedy on November 22, 1963.
- (3b) Someone kills Kennedy on November 22, 1963.
- (4b) Someone will kill Kennedy on November 22, 1963.

According to the temporal thesis, we should have said that what (1b) says about the past is exactly what (4b) says about the future and what (3b) says about the present. However, this is inconsistent with the way we use indirect discourse since we could say, in the present, about (4b), the following (5b): 'X said that someone killed Kennedy on November 22, 1963.' This description of what X said is false because X didn't have in mind an event that had occurred but an event that would occur. If we adopt the same objection for conditionals, the equivalence between (1a), (2a) and (3a) is put at risk (Dudman, 1992: 431). An immediate reply is to observe that the correct reference to (4b) would be 'X said that someone would kill Kennedy on November 22, 1963'. Dudman (1992: 432), however, insists that the occurrence of 'will' in



this case has the function of placing Kennedy's killer in the future, just as the word 'killed' places the killer in the past.

The argument must be criticized by a different route. Note that when we say 'X said that she was awake', we flex the verb to express our epistemic situation (i.e., the fact that we are referring to the past) and not to express the epistemic situation of the quoted speaker (i.e., the fact that he is referring to the present). In other words, we are referring to the speaker's assertion in (1d) as if she had said something about the past, but we know that she was saying something about her present. If this is acceptable in this case, it will also be acceptable in (5b). Moreover, it is also arguable that we can adopt a distinct manner of making an indirect speech that would not involve any counterintuitive aspects. For instance, we can replace (2d) with (2d'): X said, 'I'm awake'. We can also replace (5b) with (5b'): X said, 'Someone will kill Kennedy on November 22, 1963'.

Thus, to sum up: there are no reasons to think that indicatives and subjunctives have different truth-conditions. The Adams pair can be properly explained as a pair of conditionals that are appropriate in different contexts, given each speaker's epistemic situation, but they are made true by the same facts. Ellis (1984: 52-53) eloquently expresses the irrelevance of their difference in mood in the following passage:

The distinction [between indicatives and subjunctives] is one of mood. In many natural languages (I am assured most) in which the distinction is made at all it is made in this way, i.e., by verbal modification. But verbal modifications, such as those involved in changes of tense or mood, do not normally alter the character of sentential connectives. 'Or' and 'and' have the same significance whatever the tense or mood of the sentences they connect. Consequently, we should not expect an indicative 'if' to be any different from a subjunctive 'if'. (...) The difference between subjunctive and indicative conditionals should be more superficial than this—more like the difference between 'is' and 'was', say, than between 'is' and 'must be'. Fundamentally, logically, they should be the same, apart from the specific implications of tense and mood.

Indeed. Since verbal modifications have no logical significance with other connectives, they should not affect the truth conditions of conditionals either. The Apartheid thesis is unjustified

## 6. POSSIBLE WORLD THEORIES

The dismissal of the material account of subjunctives is partly due to the popularity of possible world theories, which can accommodate some of our modal intuitions about subjunctive conditionals. For instance, Stalnaker (1968: 102) offers an alternative approach, according to which the truth-value of  $A \rightarrow B$  is established by considering the possible world that is closest to the actual world in which  $A$  is true, and then checking if  $B$  is true in that world. A conditional is true only if  $B$  is true in this possible world, and false otherwise. If the closest  $A$ -world is the actual world, we then consider if  $B$  is true in the actual world<sup>19</sup>. If  $A$  is necessarily false, the conditional is vacuously true.

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<sup>19</sup> David Lewis (1973) offers a distinct version of possible world semantics for conditionals inspired by the same idea as Stalnaker. The main difference is that  $A \rightarrow B$  is true if and only if, in every possible  $A$ -world that is as close to the actual world as the truth of  $A$  allows,  $B$  is true. These conditions reflect many disagreements between Lewis and Stalnaker. For instance, Lewis thinks that this explanation must be provided only for subjunctive conditionals since he believes that indicative conditionals are material. Lewis also rejects the assumption that there is only one possible world more similar to the actual world since he assumes that there could be many possible worlds equally close to the actual world. There are many other possible world semantics inspired by the same idea—see Davis (1979). In any case, our core objection holds for any possible world semantics employed since it is directed against the pre-theoretic intuitions that motivate them. From here on, I will take Stalnaker's semantics as default and refer to it as vanilla possible world semantics or simply a possible world account.

These truth conditions can explain why some subjunctive conditionals with false antecedents are more plausible than others. Following our modal intuitions, this hypothesis predicts that the conditional ‘If it was raining, the street would be wet’ would be true, since in the closest world in which it is raining, the street would be wet. In contrast, the conditional ‘If it was raining, the planet would be invaded by Martians’ would be false, since in the closest world in which it is raining, the planet would not be invaded by Martians. Given that possible world theories can account for our modal intuitions regarding subjunctives so elegantly, it is no wonder that the material account, which is ridden with counter-intuitive aspects, is so promptly ignored. Critics argue that a material account of subjunctives would at best inherit the legion of problems that the material account of indicatives already has, and therefore would not be worth the trouble.

However, possible world theories also have their counter-intuitive aspects. They work as a particular case of the material account in the world selected by the evaluation of a conditional’s truth-value. In other words, when the antecedent is true, a truth-functional calculus is still used to establish the truth-values of the conditional. If in the closest  $A$ -world,  $B$  is true, then  $A \rightarrow B$  will be true even if  $A$  and  $B$  are unrelated to one another. If there are no possible worlds in which  $A$  is true or  $B$  is false,  $A \rightarrow B$  is vacuously true. These counter-intuitive aspects can hardly be perceived as an improvement over the material account. The fact that the same counter-intuitive aspects of the material account are now accompanied by a semantics that is considerably more complicated and dissociated from the truth conditions of other connectives (disjunctions and conjunctions are still material), does not make this hypothesis any more promising. Possible world theories are at a disadvantage in comparison to the material account, since they have many of its defects in new clothing, but none of its qualities, such as simplicity and logical uniformity.

Upon deeper inspection, the notion that possible world theories can capture our modal intuitions in all circumstances is a gross exaggeration. These theories are inherently inadequate to explain the truth conditions of Dutchman conditionals, which are conditionals that cannot be true if their antecedents are true. For example, the conditional ‘If John’s speaking the truth, I’m a Dutchman’ is only deemed acceptable if we assume that John is lying, but in the closest possible world where John is speaking the truth, I am not a Dutchman. While possible world theories predict that every Dutchman conditional is false, there is no independent reason to support this prediction. On the contrary, the material account has the upper hand because it can easily accommodate these cases: Dutchman conditionals are true when they have false antecedents in the actual world, but false in the closer world where they have true antecedents.

Furthermore, it is possible that possible world theories are motivated by the logical form of conditionals. The logical form of  $A \rightarrow B$  suggests inferential jumps that are naturally perplexing when it comes to truth conditions. Since the propositional form of  $A \rightarrow B$  indicates that  $B$  can be inferred from  $A$ ’s assumption, it is natural to assume that  $A \rightarrow B$  is true when  $B$  is true in the closest  $A$ -world. However, this confusion becomes evident when we consider that other propositional forms, such as  $\neg A \vee B$ , can have the same inferential jumps as  $A \rightarrow B$ , but they do not lead to the same modal intuitions. The reason is that unlike  $A \rightarrow B$ , the logical form of  $\neg A \vee B$  does not imply any inferential jump from  $A$  to  $B$ , despite the fact that they have the same inferential jumps—see the table below:

$A \rightarrow B$	$\neg A \vee B$
<i>modus ponens</i>	<i>disjunctive syllogism</i>
If Oswald did not kill Kennedy, someone else did. Oswald did not kill Kennedy. Thus, someone else killed Kennedy.	Either Oswald killed Kennedy, or someone else did. Oswald did not kill Kennedy. Thus, someone else killed Kennedy.

The truth of  $\neg A \vee B$  doesn't require an evaluation of the closest  $A$ -world; therefore, the truth of  $A \rightarrow B$  shouldn't require such an evaluation either. The only reason conditionals seem different is because of their misleading grammatical and logical form. This suggests that their truth is determined by an inferential jump from one of its constituent propositions to the other.

It is important to observe that one of the main reasons for the popularity of possible world theories also contains its fair share of fundamental problems. Possible world theories are known for their expressive power since they allow us to navigate freely in a vast ocean of possible worlds to verify the satisfaction of different patterns. Given their enormous expressive power, conditionals are routinely used to represent metaphysical principles, epistemic relations, causal chains, empirical regularities, and so on. This makes it natural to assume that the truth-value of each conditional must be determined by the satisfaction of the pattern expressed by it. If these patterns can be satisfied in circumstances that are not actual, or if they can fail to manifest themselves in the actual world, possible world semantics are needed to track these patterns in other worlds. Possible world theories seem to be a perfect marriage between the expressive power of conditionals and our corresponding modal intuitions attached to them.

However, this expressive power of possible world theories is both their main strength and their main weakness, as they make logic hostage to different modal intuitions that are in constant conflict and pulling in different directions. To understand this, we need to consider a few things first. Possible world proponents can't afford the satisfaction of every single modal intuition, so they stick with one of them at the expense of the others. This, in turn, generates criticisms. The vanilla possible world semantics states that  $A \rightarrow B$  is true if and only if the closest  $A$ -world is a  $B$ -world. Notice that these theories seem appropriate for conditionals that express causal relations by allowing us to determine whether the conditional is true even if the antecedent is false in the actual world. For instance, the truth-value of the conditional 'If this match is struck, it will light' can be determined in the closest possible world where the antecedent is true, even if the antecedent is false in the actual world. If in the closest world in which the match is struck, it lights, then the conditional is true; otherwise, it is false. Thus, it becomes possible to test or verify whether the pattern expressed by the conditional would be realized in the proper circumstances through an alternate means.

So far, so good. However, problems arise when the pattern is satisfied in many other possible worlds. Possible world theories appear to be inadequate in explaining our intuitions about tautological conditionals that are true by definition, such as 'If a figure is rectangular and equal-sided, then it is a square' and 'If today is Tuesday, then tomorrow isn't Friday.' The idea that we need to check the closest antecedent-world to determine the truth of the consequent seems far-fetched, since these conditionals are true by definition, and we can recognize their truth by their logical form alone (Hunter, 1993: 289). Therefore, it is implausible that a possible world semantics would be necessary to express the related modal intuitions.

It is possible that the semantics must be adjusted to fit the stronger or weaker patterns of each conditional. Tautological conditionals express a conceptual necessity that is not guaranteed only by the closest worlds. Thus, one could argue that the conditional  $A \rightarrow B$  is true if and only if  $B$  is true in all  $A$ -worlds, not just the closest  $A$ -worlds. However, this modification may not be enough, and further adjustments may be necessary if the relations involve impossibilities. For example, the conditional 'If 16 were divisible by 9, it would be divisible by 3' intuitively expresses a conceptual necessity, but there is no possible world in which 16 is divisible by 9. Therefore, another semantics would be required to include impossible worlds<sup>20</sup>.

Furthermore, it could be argued that the semantics should be revised to accommodate our modal intuitions in epistemology. Certain modal intuitions in the analysis of knowledge have led some philosophers to demand a different possible world theory. Vanilla possible world theories imply that any conditional with a true antecedent and consequent is true, but these truth conditions cannot do justice to Nozick's analysis of knowledge. Nozick (1981: 18)

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<sup>20</sup> See Sorensen (1996), Nolan (1997) and Zalta (1997).

employs new clauses as substitutes for justification in an analysis of knowledge. He explains that a subject *S* knows a proposition *P* if and only if:

- (1) *P* is true.
- (2) *S* believes that *P*.
- (3) If *P* weren't true, *S* wouldn't believe that *P*.
- (4) If *P* were true, *S* would believe that *P*.

The element (3) is introduced in the definition to block Gettier's counterexamples since in these cases *S*'s belief that *P* is not sensitive to the truth of *P*, especially if *S* would still believe that *P* even if *P* were false. *S* knows that *P* if her belief in *P* is safe, i.e., if her belief could not easily be false.

In order to prevent Gettier-style counterexamples, an additional condition (3) is included in the definition of knowledge, requiring that *S*'s belief in *P* is sensitive to the truth of *P*. That is, *S* knows *P* only if her belief in *P* could not easily be false. While possible world theories typically entail (4) from (1) and (2), Nozick argues that (3) must involve not just the closest *P*-world, which would be the actual world, but an appropriate range of possible worlds close to the actual world in which *P* is true. Thus, *S* knows *P* if an appropriate range of possible worlds close to the actual world in which *P* is true, *S* believes it. Only in this way can we do justice to (3) and explore the consequences of maintaining the truth of *P*, while changing other things (Read, 1995: 55–56). This requires a modification of possible world semantics to fit Nozick's intuitions about the nature of knowledge, suggesting that a whole new logic must be designed to express the truth conditions of conditionals that account for different modal intuitions and patterns. This approach, however, sacrifices logic's generality and practicality, as it requires building a new possible world semantics for every new pattern expressed by conditionals. The task of determining the truth conditions of conditionals was thus hijacked by other theoretical interests that go beyond its original scope. Therefore, we should not be forced to choose between different logics when formalizing a conditional sentence, but rather develop a more general approach that does justice to our modal intuitions without sacrificing logic's generality and practicality.

Possible world theories are viewed differently by their advocates and detractors, especially those who support the material account. Proponents of possible world theories consider its flexibility to be a major strength, while supporters of the material account regard it as a weakness because it tends to introduce non-logical factors. Conversely, critics of the material account dismiss it because it relies solely on actual truth-value combinations to determine the truth conditions of conditionals and the nature of validity. Interestingly, this limitation is perceived as an advantage by its proponents. This suggests that possible world enthusiasts are either uninterested in pure logic or have a different perspective on what logic should aim for.

Another problem that should not be ignored is the need to distinguish between the ability of possible world semantics to track different patterns across possible worlds and its ability to express our modal intuitions about these patterns. While the second task seems at least in principle feasible, the first is doomed to fail from the beginning due to circularity. To decide whether to accept or reject a conditional  $A \rightarrow B$ , we need to consider the available reasons for accepting it. However, the vanilla possible world account suggests that we should instead consider whether *B* would be true in the closest *A*-world. This approach, however, reverses the order of acceptance, as we can only determine whether *B* would be true in the closest *A*-world if we already have reasons to accept it in the first place. The same criticism can be extended to its use as a tool to track patterns: it only allows us to track different patterns whose distribution in the modal universe we already assume. Therefore, the possible world semantics can only express some of our modal intuitions.

The truth conditions are easily applicable to conditionals that are already known to be true for independent reasons. For instance, under standard conditions, we know that touching a live wire will result in an electric shock. Given this knowledge, we can infer the consequent based

on the hypothetical assumption of the antecedent. However, this is only possible because we have already established the truth of the conditional in the first place.

Now, given the lack of independent reasons to determine whether a conditional is acceptable or not, the test will be ineffective. Consider the following pair of conditionals:

(1c) If Bizet and Verdi had been compatriots, Bizet would have been Italian.

(2c) If Bizet and Verdi had been compatriots, Verdi would have been French.

It is unclear to me whether Bizet would be Italian or Verdi would be French under the hypothetical assumption that they are compatriots because there is no evidence pointing in either direction (Quine, 1982: 23). This is one of the major challenges posed by possible world theories, as they place an enormous epistemic burden on our analysis of conditionals. To determine the truth-value combinations of a conditional in a different possible world, we need to imagine and provide justifications based on matters of fact. This is exemplified by Lewis' criteria of similarity, which seeks to determine which possible world is closer to the actual world by considering factors such as the presence of large or small miracles and degree of similarity to the actual world. This can be a daunting task.

In contrast, the material account offers a simpler solution. We do not need to explore what happens in other possible worlds; instead, we can rely on consistency in truth-value attribution to determine whether an argument preserves the truth of its premises. If each propositional variable maintains the same truth-value throughout the argument, we can determine whether there is any possible combination that would fail to preserve the truth. The beauty of the material account lies in its simplicity.

There are various criticisms that call into question the ability of the possible world account, even when it is understood in a limited role. For instance, the fact that some of the proponents of the possible world account acknowledge that they are only 'modest realists', that there are context-dependent ways of determining the similarity relation, and that the truth conditions for subjunctives can be highly indeterminate, is not reassuring. The truth conditions of a conditional in a possible world account are context-dependent and subjective. In this theory,  $A \rightarrow B$  is true if  $B$  is true at the closest  $A$ -world (or at all the closest  $A$ -worlds). However, the problem is that 'closest  $A$ -world' is just a synonym for 'belief system updated by the hypothetical addition of  $A$ .' This is not surprising since these truth conditions were motivated by Ramsey's test, which states that in order to accept  $A \rightarrow B$ , we add  $A$  (hypothetically) to our system of beliefs, make whatever adjustments are required to maintain consistency without modifying the hypothetical belief in  $A$ , and consider whether or not  $B$  is true. The point is that claiming that  $A \rightarrow B$  is true if  $B$  is true in the closest  $A$ -world is just a different way of saying that  $A \rightarrow B$  is true if  $B$  is true in my system of beliefs updated by the hypothetical addition of  $A$ . However, since different individuals will have different belief systems, the truth-value of a given conditional will be relative to each belief system. A similar criticism is that the possible world approach only provides acceptability conditions that will vary according to the speaker's beliefs about which world is closer (Mackie, 1973: 89). This implies that the expression of modal intuitions allowed by the possible world account is marred by the threat of subjectivism.

And this is just one of a long list of problems that includes irreducible disputes about particular conditionals (Rieger, 2017: 187–188) and the consequence that most ordinary subjunctives are false (Hájek, 2014). The list is too extensive to discuss in detail here, but it serves to reinforce the point that the utility of possible world accounts is far from obvious. Moreover, the prospectus of subjunctive conditionals either having subjective truth-values, or most of them being false, could be hardly considered an improvement over most subjunctives being vacuously true, as it is implied by the material account. At least the material account provides a simple and austere semantics.

## 5. CLOSING REMARKS

I have argued that subjunctive conditionals can be interpreted as material, contrary to prevailing beliefs. Modal intuitions related to subjunctive and indicative conditionals are similar, and if pragmatic explanations can account for the latter, then they can also account for the former. The truth-functional theorist cannot deny this without inconsistency, as the principles entailing the material account also apply to subjunctive conditionals. Thus, the theses that indicative and subjunctive conditionals are material are intertwined. I criticized the justifications for denying the material account, including the examples supporting the Apartheid thesis and possible world theories. While a conclusive argument is unlikely in philosophy, I believe I have presented a plausible case that may overcome objections to the material account of subjunctives.

## REFERENCES

- Adams, E. (1965). The logic of conditionals. *Inquiry: An Interdisciplinary Journal of Philosophy*, 8(1-4), 166–197.
- Adams, E. (1975). *The Logic of Conditionals: An Application of Probability to Deductive Logic*, Dordrecht-Holland/Boston-U.S.A: D. Reidel Publishing Company.
- Ajdukiewicz, K. (1956). Conditional Sentence and Material Implication, *Studia Logica: An International Journal for Symbolic Logic*, 4(1), 117–153.
- Allott, N; H. Uchida (2009a). Classical logic, conditionals and “nonmonotonic” reasoning. *Behavioral and Brain Sciences* 32(1), 85.
- Allott, N; H. Uchida (2009b). *Natural language indicative conditionals are classical*. UCL Working Papers in Linguistics, 1–17. <http://www.ucl.ac.uk/psychlangsci/research/linguistics/publications/wpl/09papers/allott>.
- Anderson, A. (1951). A Note on Subjunctive and Counterfactual Conditionals. *Analysis*, 12(2), 35–38.
- Anscombe, E. (1981). Subjunctive Conditionals. In Anscombe, E. (Ed.) *Collected Philosophical Papers: Metaphysics and the Philosophy of Mind*, Minneapolis: University of Minnesota Press.
- Appiah, A. (1985). *Assertion and Conditionals*. Cambridge: Cambridge University Press.
- Ayers, M. R. (1965). Counterfactuals and Subjunctive Conditionals. *Mind*, New Series, 74(295), 347–364.
- Barker, S. (1995). Towards a Pragmatic Theory of ‘If’. *Philosophical Studies*. 79(2), 185–211.
- Barker, S. (1997). Material implication and general indicative conditionals. *The Philosophical Quarterly*, 47(187), 195–211.
- Bennett, J. (2003). *A Philosophical Guide to Conditionals*. Oxford: Clarendon Press.
- Bennett, J. (1995). Classifying Conditionals: The Traditional Way is Right. *Mind*, 104(414), 331–44.
- Breul, C. (2022). If a man buys a horse, ... you have no argument against material implication: On a flaw in the foundations of the restrictor approach to conditionals. *Linguistische Berichte* 269, 43–54.
- Brogaard, B; J. Salerno. (2008). Counterfactuals and context. *Analysis*, 68(1), 39–46.
- Chakraborti, C. (1998). Some Remarks on Ernest Adams's Theory of Indicative Conditionals, *Indian Philosophical Quarterly*, 25(4), 495-509.
- Clark, M. (1971). Ifs and Hooks, *Analysis*, 32(2), 33–39.
- Davis, W. (1979). Indicative and Subjunctive Conditionals. *The Philosophical Review*, 88(4), 544–64.
- DeRose, K. (1999). Can It Be That It Would Have Been Even Though It Might Not Have Been?,” *Philosophical Perspectives*, 13: 387–413.
- DeRose, K., Grandy, R. (1999). Conditional Assertions and “Biscuit” Conditionals. *Noûs*, 33(3), 405–420.

- Dudman, V. H. (1992). A Popular Presumption Refuted. *The Journal of Philosophy*, 89(8), 431–432.
- Dudman, V. H. (2000). Classifying ‘conditionals’: the traditional way is wrong. *Analysis*, 60(266), 147.
- Dudman, V. H. (1984). Parsing ‘If’-Sentences. *Analysis*, 44(4), 145–153.
- Dummett, M. (2004). *Truth and the Past*. New York: Columbia University Press.
- Edgington, D. (1986). Do Conditionals Have Truth Conditions? *Crítica: Revista Hispanoamericana de Filosofía*, 18(52), 3–39.
- Edgington, D. (1995). On Conditionals. *Mind*, 104(414), 235–329.
- Ellis, B. (1984). Two Theories of Indicative Conditionals. *Australasian Journal of Philosophy*, 62(1).
- Fogelin, R. (1998). David Lewis on indicative and counterfactual conditionals. *Analysis*, 58(4), 286–289.
- Gauker, C. (2005). *Conditionals in Context*. Cambridge, Mass: The MIT Press.
- Goodman, S. N. 1947. The problem of counterfactuals conditionals. *Journal of Philosophy*, 44(5), 113–128.
- Grice, P. (1989). Indicative Conditionals. In: *Studies in the way of words*. Cambridge: Harvard University Press.
- Hanson, W. (1991) Indicative Conditionals Are Truth-Functional. *Mind*, New Series, 100(1), 53–72.
- Hájek, A. (2014). Most counterfactuals are false. Unpublished. Available at: [http://philosophy.anu.edu.au/sites/default/files/Most%20counterfactuals%20are%20false.1.11.11\\_0.pdf](http://philosophy.anu.edu.au/sites/default/files/Most%20counterfactuals%20are%20false.1.11.11_0.pdf) (last visited on October 12, 2015).
- Hunter, G. (1993). The Meaning of ‘If’ in Conditional Propositions. *The Philosophical Quarterly*, 43(172), 279–297.
- Jackson, F. (1987). *Conditionals*. Oxford: Basil Blackwell.
- Jackson, F. (2006). Indicative Conditionals Revisited. Seminar at the Chinese University of Hong Kong. URL: <http://phil.arts.cuhk.edu.hk/~phidept/TCIVP/jackson/indicative.pdf>.
- Johnston, D. (1996). The Paradox of Indicative Conditionals. *Philosophical Studies*, 83(1), 93–112.
- Kaplan, D. (1989). Demonstratives. In *Themes from Kaplan*, ed. J. Almog, J. Perry and H. Wettstein, 481–563. New York: Oxford University Press.
- Leavitt, F. (1972). An Unpublished Remark of Russell’s on “If ... Then”. *Russell: The Journal of Bertrand Russell Studies*, 92(2), 10.
- Lewis, D. (1973). *Counterfactuals*, Oxford: Blackwell Publishers.
- Lewis, D. (1976). Probabilities of Conditionals and Conditional Probabilities. *Philosophical Review*, 85(3), 297–315; reprinted in Harper et al. (eds.) (1981) *Ifs*, Dordrecht: D. Reidel.
- Lewis, D. (1979). Counterfactual Dependence and Time’s Arrow. *Noûs*, 13(4): 455–76.
- Lowe, E. J. (1979). Indicative and Counterfactual Conditionals. *Analysis*, 39(3), 139–141.
- Lowe, E. J. (1995). The Truth About Counterfactuals. *The Philosophical Quarterly*, 45(178), 41–59.
- Lycan, W. (1999). It’s Immaterial (a reply to Sinnott-Armstrong). *Philosophical Papers*, 28(2), 133–136.
- Mackie, J. L. (1973). *Truth, probability and paradox: studies in philosophical logic*. USA: Oxford University Press.
- McDermott, M. (2004). Critical Notice of Bennett’s A Philosophical Guide to Conditionals. *Australasian Journal of Philosophy*, 82(2), 341–350.
- McDermott, M. (1999). Review of Woods’ Conditionals. *The Philosophical Review*, 108(1), 103–106.
- McGee, V. (1985). Counterexample to Modus Ponens. *The Journal of Philosophy*, 82(9), 462–47.
- Mellor, D. (1993). How to Believe a Conditional. *The Journal of Philosophy*, 90(5), 233–248.
- Noh, E.-J. (1998). A relevance-theoretic account of metarepresentative uses in conditionals. In Rouchota, V. and A. H. Jucker, eds., *Current Issues in Relevance Theory*, Amsterdam: John Benjamins, 271–304.

- Nolan, D. (1997). Impossible Worlds: A Modest Approach. *Notre Dame Journal of Formal Logic*, 38(4), 535–572.
- Nozick, R. (1981). *Philosophical Explanations*. Oxford: Clarendon Press.
- Quine, W. (1982). *Methods of Logic*. Cambridge, MA: Harvard University Press.
- Ramsey, F. General Propositions and Causality, 1929, 237–255. In: *The foundations of mathematics and other logical essays*, (ed.) Braithwaite, R. B. London: Routledge & Kegan Paul, 1950.
- Read, S. (1992). Conditionals Are Not Truth-Functional: An Argument from Peirce. *Analysis*, 52(1), 5–12.
- Read, S. (1995). Conditionals and the Ramsey Test. *Proceedings of the Aristotelian Society Supplementary Volume*, 69(1), 47–65.
- Rieger, A. (2006). A simple theory of conditionals. *Analysis*, 66(3), 233–40.
- Rieger, A. (2013). Conditionals are material: the positive arguments. *Synthese*, 190(15), 3161–3174.
- Rieger, A. (2017). Was Quine Right About Subjunctive Conditionals? *The Monist*, 100(2), 180–193.
- Sanford, D. (2003). *If P, Then Q: Conditionals and the Foundations of Reasoning*. 2nd ed. London: Routledge.
- Sinnott-Armstrong, W; Moor, J; Fogelin, R. (1990). A Defence of Modus Tollens. *Analysis*, 50(1), 9–16.
- Sinnott-Armstrong, W. (1999). “MPP, RIP” RIP. *Philosophical Papers*, 28(2), 125–131.
- Smith, N. (1983). On Interpreting Conditionals. *Australian Journal of Linguistics*, 3(1), 1–24.
- Smith, N; Smith, A. (1988). A Relevance-theoretic Account of Conditionals. In Larry M. Hyman; Charles N. Li, eds., *Language, Speech and Mind: Essays in Honour of Victoria A. Fromkin*, pp. 322–352. London: Routledge.
- Sorensen, R. (1996). Modal Bloopers: Why Believable Impossibilities Are Necessary. *American Philosophical Quarterly*, 33(3), 247–261.
- Stalnaker, R. (1968). A Theory of Conditionals. In *Studies in Logical Theory*. Oxford: Blackwell Publishers.
- Stalnaker, R. (1975). Indicative Conditionals. *Philosophia*, 5(3), 269–86.
- Strawson, P. (1986). ‘If’ and ‘ $\supset$ ’. In *Philosophical Grounds of Rationality: Intentions, Categories, Ends*, vol. Grandy, R. and Warner, R. (eds) Clarendon Press, 229–42.
- von Fintel, K. (2012). Subjunctive conditionals. In Gillian Russell & Delia Graff Fara (eds.), *The Routledge companion to philosophy of language*, 466–477. New York: Routledge.
- Zalta, E. (1997). A Classically-Based Theory of Impossible Worlds. *Notre Dame Journal of Formal Logic*, 38(4), 640–660.
- Williamson, T. (2020). *Suppose and Tell: The Semantics and Heuristics of Conditionals*, Oxford University Press.
- Woods, M. (1987). *Conditionals*. Oxford: Clarendon Press.