

SUBJUNCTIVE CONDITIONALS ARE MATERIAL

Draft of August 26, 2021

Matheus Silva

ABSTRACT

The material account claims that indicative conditionals are material. However, the conventional wisdom even among material account enthusiasts is that the material account cannot be extended to subjunctive conditionals. There are mainly three reasons that motivate this consensus: (1) the belief that if subjunctives were material, most subjunctive conditionals would be vacuously true, which is implausible; (2) its inconsistency with Adams pair, which suggest that indicative and subjunctive conditionals have different truth conditions; and (3) the belief that it is an inferior hypothesis compared to the possible world theories. I will argue against (1) that the counterintuitive aspects of vacuously true conditionals can be explained away in a uniform fashion, regardless of whether they are indicatives or subjunctives. I reinforce this assumption by showing that the positive arguments for the material account of indicatives are also intuitively valid for subjunctives. The point mentioned in (2) is resisted by explaining Adams pair as logically equivalent conditionals that can be appropriate at different times, depending of the speaker's epistemic situation. Finally, (3) is criticised by making the case that the possible world account faces insurmountable problems and that a full-blown material account of indicatives and subjunctives is overall a more elegant solution.

1. INTRODUCTION

A conditional is a sentence composed by a subordinate clause, usually accompanied by the term 'if', that indicates the condition for the occurrence of the main clause. Two examples of conditionals are 'If it rains there will be a flood in the city' and 'If it had rained, there would be a flood in the city'. Conditional sentences are usually classified according to the grammatical mood of the verbs. When the verbs are presented in the indicative mood, the conditional is called 'indicative'; while if there are in the subjunctive mood, they are called 'subjunctive'. The examples mentioned above are respectively of an indicative conditional and a subjunctive conditional¹.

The material account of indicatives states that indicative conditional sentences and the material conditional have the same truth conditions. It is an elegant explanation, but it has some counter-intuitive aspects, e.g., it implies that any indicative conditional with a false antecedent or a true consequent is vacuously true. Despite these problems, the material account found many defenders that attempted to explain away its counter-intuitive aspects as resulting from

¹ 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 allow us to recognise visible grammatical features such as the use of 'would' in the main clause and a past tense in the 'if'-clause.

the confusion between pragmatic elements of the natural language and logic (or semantic) elements².

One would expect that the material account would be naturally extended to subjunctive conditionals. However, the consensus in the literature³ is that subjunctive conditionals cannot be material. Interestingly though, even proponents of the material account express a sceptical attitude regarding this possibility⁴. I will argue that this consensus is unfounded. In the sections 2, 3 and 4, I make the case that material theorists must adopt the material account of subjunctives for the sake of coherence. In the section 5, I argue that the examples that motivate the belief that indicative and subjunctive conditionals have different truth conditions are not convincing. In the section 6, I argue that possible world theories have too many problems to be considered the default position about the subject and cannot be considered superior to the material account from the get-go.

2. FOR THE SAKE OF COHERENCE

One of the main reasons that lead us to the prevailing idea that subjunctives are not material is that it does not do justice to our modal intuitions about subjunctive conditionals. A material conditional is true when its antecedent is false, but since the vast majority of subjunctive conditionals are asserted under the assumption that their antecedents are false, if they were material, it would follow that the vast majority of subjunctive conditionals are vacuously true. 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 instance, given usual conditions and the fact that it was not raining, the conditional ‘If it was raining, the street would be wet’ is intuitively true, while the conditional ‘If it was 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, for both of them are true solely due to the falsity of the antecedent.

The first thing that is important to observe is that this line of reasoning can be questioned using the same line of reasoning that material account theorists already employ regarding indicative conditionals with false antecedents. A large number of indicative conditionals have false antecedents, but any material account proponent would admit that: (1) those indicative conditionals are vacuously true, (2) their counter-intuitive aspects can be explained away by pragmatic means, and (3) the fact that they are in large numbers is irrelevant to the question. If these answers can be plausible in this case, they will also be plausible if most subjunctive conditionals are vacuously true. The fact that there are even more vacuously true subjunctives than vacuously true indicatives does not affect the strength of the argument.

As a matter of fact, the item (2)—the fact material account theorists attempt to explain away the counter-intuitive aspects of indicative conditionals by pragmatic means—ensures that a material account of subjunctives is inevitable for *any* defence of the material account due to a question of coherence. After all, all the intuitions that motivate the belief that subjunctive

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

³ 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.

⁴ 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.

conditionals are not material are the same that motivate the belief that indicative conditionals are not material. For instance, a subjunctive conditional such as ‘If today were Thursday, the Martians would invade our planet’, will be vacuously true according to the material account if the antecedent is false, but its counter-intuitiveness can be explained by the same pragmatic resources used with indicatives. Paul Grice (1989) could explain the counter-intuitive aspect of this subjunctive in the following way: the conditional is counter-intuitive because it is conversationally inappropriate, since the assertion of a conditional conveys a conversational implicature that the speaker has indirect, or non-truth-functional, evidence for the proposition asserted. Since one would only assert this subjunctive due to the falsity of its antecedent, she would implicate a false implicature, thus being conversationally inappropriate. Therefore, the subjunctive conditional is counter-intuitive because it is not conversationally appropriate.

Frank Jackson (1987) tried a different approach that 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 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 probability of the conditional asserted would remain high if the antecedent turns out to be true, or to put in other words, 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 was wrong about today’s date, and in fact 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 in this case 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 fallacy⁵. 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 modal intuition tends to ignore this basic fact, because it conceives a possible circumstance in which the antecedent is true in order to evaluate the truth value of the conditional, even if the antecedent is actually false. This is as contextual fallacy, because in order to determine the truth value of a conditional, the modal intuition 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 in order for $A \rightarrow B$ ⁶ 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

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

⁶ 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.

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

However, I think that this restriction is a consequence of the problems of this approach. It seems that Rieger's solution offers conditions of assertibility for conditionals motivated only by regular 'if A , B ' constructions. Since these expressions implicitly suggest that the speaker does not know the truth values of A and B , it is natural to think that they would not be proper to assert otherwise. But this line of reasoning gives too much importance to regular 'if' constructions when in reality the terms employed on the subordinate clause of a conditional can vary according to the speakers' assumptions and different contexts. Once we understand this fact, it is hard to ignore that examples that violate II and III abound. 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 under the assumption that both the antecedent and the consequent are true. Why? Because the speaker is using a term that adequately express her knowledge about the truth value of the constituents involved. There are many other suitable terms such as 'Given that A , B ', ' B , because A ', 'When A , B ', 'Despite A , B ', etc⁷.

But this solution also faces counter-examples with regular 'ifs' in contexts in which it is implicitly obvious to interlocutors what are the speaker's assumptions. 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 of Kripke's thesis about the necessity of identity a teacher asserts the following conditional, 'If water is H_2O , then it is necessarily H_2O '. 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 that presents an informal proof that there are infinite prime numbers with two conditionals: If there is a N which is the biggest prime number, there is a prime number bigger than N . If there is a 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 (Jackson, 1987: 53). 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 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 are compatible with Rieger's solution⁸.

Another problem of this approach to assertability is that it predicts that any conditional that occurs in an instance of *modus ponens* and *modus tollens* are inappropriate. Consider the

⁷ '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 he will resign despite the offer, i.e., his confidence in the truth of the consequent is independent of the antecedent. But the 'even' particle could be dispensed altogether if the context is enough to understand the speaker's beliefs, e.g., '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, e.g., 'Even being older, she is still attractive'. The verbal modifications characteristic of subjunctive conditionals admits 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 the opposite it is indicated by the context.

⁸ Other possible contexts that will be problematic for this solution includes guessing games and testimonies, but I will not discuss these contexts to avoid a needlessly long digression.

following instance of *modus ponens*: ‘If you’re late, you can’t take the bus. You are late. Therefore, you can’t take the bus’. This seems implausible. Rieger (2015: 254–255) anticipated this objection by arguing that these examples are special cases that should be expected in a Gricean approach. Other special cases in which a conditional is assertable although II and III are not satisfied are 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’.

But this seems a cop-out to avoid the issue. If the requirements do not apply in these cases, what reason is there to interpret these examples as special cases instead of just counter-examples? Is an instance of *modus ponens* to be interpreted as a special circumstance or as a basic use that should be predicted? The other examples mentioned above suggest that these cases are not rare. If the solution should be applied 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 is not to be arbitrarily restricted to a few cases, but should have the generality necessary to be applied to a vast range of examples and circumstances where the assertability of conditionals take place⁹.

Thus, the fact that this approach cannot be extended to subjunctives should not be seen as problem, since it already makes too many wrong predictions with indicative conditionals to begin with. As a matter of fact, the very idea that a theory of assertability of indicative conditionals cannot be applied to subjunctive conditionals seems implausible and should be received with scepticism, since verbal modifications should not have this impact on our rules of appropriate conversation and certainly do not have any impact so as far as disjunctions and conjunctions are concerned.

Perhaps the fact that subjunctive conditionals misleadingly suggest that the speaker is considering a context in which the antecedent is true explains why the resistance against the material account is even stronger with subjunctives than indicatives. It would not be an exaggeration to suggest that the mistakes committed by the critics of the material account are also committed by the material account theorists when subjunctive conditionals are concerned.

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 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)¹⁰:

⁹ Rieger says that his theory is Gricean in spirit, but Grice’s solution grounds the assertability of a conditional in the implicature of indirectness it conveys, i.e., in the implicature that the speaker believes she has indirect, or non-truth-functional evidence to accept the conditional that is asserted. The fact that one has truth-functional evidence to accept a conditional is not inconsistent with the fact that she also has indirect evidence on top of it. If this implicature of indirectness is true, the conditional is assertable, even if the speaker knows the truth values of its propositional components. If this implicature of indirectness is false, the conditional is unassertable, even if the speaker ignores the truth values of its propositional components. This explains why Grice’s solution does not face any of the problems mentioned above. In the contexts involving the game of Bridge, ‘even-if’ and Dutchman conditional examples, the relevant evidence is truth-functional, not indirect. The other examples involving conditionals in teaching and *modus ponens* instances are not a problem for Grice, since they do not convey a false implicature of indirectness. Rieger’s position is more plausibly classified in the same lines of the solution of Ajdukiewicz (1956).

¹⁰ The argument is attributed to Stalnaker (1968: 269).

| | | | |
|------|-----|---|--|
| 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 |

Curiously, similar instances are also intuitively valid for subjunctive conditionals, for instance, 'If any stranger had approached, the dog would have barked. Therefore, no stranger approached, or the dog would have barked' (Anscombe, 1981: 203), and 'If Napoleon were not a conqueror, he would have died young. Therefore, Napoleon would have been a conqueror, or else have died young' (Anscombe, 1981: 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) |

Now, being a central principle for the material account, the validity of (EXP) for subjunctive conditionals would mean that subjunctives are material. This is exactly what is suggested by intuitive instances of (EXP) with subjunctives such as the following: '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), that principle that the acceptance that every F is G allows us to infer that $Fa \rightarrow Ga$ (Rieger, 2013: 3166–7). This can be used in a positive argument for the material account since the only way that the falsity of $Fa \rightarrow Ga$ could imply the falsity of every F is G is by having a true antecedent and a false consequent. Rieger presents the following intuitive instance of this principle: Given that everyone studying French is studying German and Anna is one of the students, we can infer that if Anna is studying French, then she is studying German. Now, a similar conclusion could be inferred in the subjunctive mood, namely, if Anna had studied French, she would have studied German.

Two of the previous arguments employed (CP). This principle can also be used to show that conditionals obey conditional negation (CN), i.e., the principle that $A \rightarrow B$ is logically

equivalent to $\neg(A \& \neg B)$. The argument that allows us to derive (CN) with (CP) also involves (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) |

What is important is that (CP) is intuitively valid whether the conditional in question is indicative or subjunctive. If A entails 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 instance, if the proposition that Socrates is Athenian entails the proposition that Socrates is Greek, then it is a logical truth that ‘if Socrates is Athenian, he is Greek’, and ‘If Socrates were Athenian, he would have been Greek’. Again, the fact that the conditional is in a different grammatical mode makes no difference from a semantic point of view. The same could be said about (CN). It is also intuitively valid for subjunctives: ‘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 , B entails C , it follows that A entails $B \rightarrow C$. Rieger, correctly to my view, uses the following example to claim that this principle is intuitively valid: given that 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, 2013: 3164). Now, (GCP) could 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 $A \supset B$, $A \models B$, since it is uncontroversial that (MP) is valid for ‘ \supset ’. From (GCP) it follows that $A \supset B \models A \rightarrow B$ (Rieger, 2013: 3163). Thus, (GCP) implies that conditionals are material. What is interesting is that the intuitive instance of (GCP) involving indicative conditionals is intuitively valid when the indicative conditional in the conclusion is replaced by a subjunctive conditional: ‘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. As simple as it is, this reasoning 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* way things could have been, thus putting in 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 constant¹¹. That this tenet must be observed is 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 counter-examples to *modus ponens* presented in the literature is that they result from an illicit context in the evaluation of the argument¹². But there is no need to defend *modus ponens* in order 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 shift since the actual propositional content has temporal indexers. Thus, if the premise is intended to refer 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 in order to make the conclusion false will be ineffective with this qualification since the truth values of the propositions will not vary across time. Of course, in order 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 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.

But if this qualification is made, then there are no contextual shifts against (GCP) either. If the premise ‘I have eggs’ needs to be expanded to include its unarticulated constituents, for instance, ‘I have eggs at the time *t*, in the place *x*’, then the conclusion would be ‘if I had olive oil at the time *t*, in the place *x*, I could make mayonnaise at the time *t*, in the place *x*’. Thus, there would be no counter-examples to (GCP) with subjunctive conditionals.

Surprisingly, this platitude about the importance of maintaining the context fixed also enable us to block the main counter-examples to the material account. The counter-examples to contraposition, strengthening of the antecedent and hypothetical syllogism with indicative conditionals¹³ and subjunctive conditionals¹⁴ are usually perceived as an indisputable proof that the material account of indicatives and subjunctives are false. They are not known as

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

¹² See McGee (1985), Lycan (1999), and Sinnott-Armstrong (1999).

¹³ See Adams (1965); Bennett (2003).

¹⁴ See Lewis (1973).

conditional fallacies for nothing. However, these counter-examples involving indicatives¹⁵ and subjunctive conditionals¹⁶ are disarmed if the context is kept fixed. 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.

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. It does not matter what is the operator, the truth-functional thinking is the same.

In fact, the same logic applies whether the operator in question is in the indicative or subjunctive mood. In virtue of grammatical habits, we will rarely find a free-standing conjunction with subjunctive clauses, but 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). The same could be said about the rarity of free-standing disjunctions with subjunctive clauses, but that can also occur naturally in 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). But 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 similar world Oswald would have not killed Kennedy and no one else would have. However, 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'. Besides, it could be objected that the counter-example 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.

¹⁵ See Allott & Uchida (2009a; 2009b); Chakraborti (1998: 498–501); Lycan (1999: 133–136).

¹⁶ See 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 counter-examples 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 of the antecedent for subjunctives, and Read (1992: 7) accepts a similar explanation for one particular counter-example involving a classical inferential form with quantifiers.

It is also important to observe that these examples represent a problem for the possible world account, since this hypothesis receives considerable intuitive support from subjunctive conditionals especially due to their subjunctive clauses. But here we have examples of conjunctions and disjunctions with subjunctive clauses and yet no one would say that the subjunctive conjunctions require a possible world semantics. If there are no good reasons to provide a possible world semantics as a fundamental principle for disjunctions or conjunctions, then there are no good 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 suppositional theorists, which claim that conditionals are not propositions, but conditional assertions of the consequent given the assumption of the antecedent¹⁷. It does not seem likely that only conditionals among the logic operators would lack truth values. If there are no reasons to think that logic 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 logic 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, suppositional theories do it even less since 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’s a drastic revisionary hypothesis that goes against our explanation of closely related phenomena. The same thing could be said about the conclusion that conditionals lack truth conditions. It seems 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 from the group as an exceptional case? This hypothesis only works by isolating conditionals from other connectives. The inferences with disjunction and conjunction are severed and we are left 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 close to its connective partners. If conjunctions and disjunctions are truth function of two propositions, so are conditionals. The semantics must be an account universally applicable to every connective. Treating conditionals as *sui generis* operators are a step backwards compared to the truth functional thinking. We need a uniform

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

account of connectives, but the only way to achieve that is by accepting a full-fledged material account that includes both indicatives and subjunctives.

5. THE APARTHEID THESIS

An independent reason to think that the material account cannot be extended to subjunctives is the belief that indicative and subjunctive conditionals have different truth conditions, also known as the Apartheid thesis. This thesis is supported by the widely held belief that indicative conditionals concern how things are, while subjunctive conditionals concern an alternative way things could have been, or in other words, indicative conditionals are about the actual world, while subjunctive conditionals are about other possible worlds. Jackson (1987: 74–75) argued for this assumption 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 that it won't be cancelled if it doesn't rain. Suppose further that you have the following beliefs about the way things will actually be: it won't rain and the match will happen. Now, 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's reasoning is 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 is 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)¹⁸.

These arguments, however, face many objections. It is arguable that 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 on 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 by the same reasons of 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 is just 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.

This resistance probably results from our linguistic habits of interpreting subjunctive conditionals as being asserted under the assumption that the antecedent is false. Since the antecedent of (2a) involves the proposition that Oswald did not kill Kennedy, and the antecedent is assumed as false, but not (1a), their contextual assumptions seem to be distinct. This becomes clear if we consider that if this assumption were to be cancelled, both will 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 completely, 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 assumptions that someone different from Oswald killed Kennedy. (1a) admits a non-conspiratorial interpretation even if we wouldn't have decided about the identity of Kennedy's assassin.

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

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 as 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.

Someone could insist then that we should incorporate the contextual assumptions implicit in each conditional in their propositional content. If (1a) involves only the assumptions that Kennedy was killed by someone and that Oswald is the main suspect, then (2a) must involve the same assumptions. Thus, (2a) must be interpreted as (2a)* 'If Oswald wasn't the one who killed Kennedy, then someone else was'. Thus, if (1a) is interpreted as an attribution of identity, its corresponding pair is (2a)* not (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), so it is (3a). But it is not obvious how an attribution of identity could fit in accord 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 '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 sound 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 the same facts, but that can be appropriate in different moments, depending of the speaker's epistemic situation. For instance, an indicative conditional asserted today such as 'If it rains tomorrow, the match will be cancelled', is intuitively equivalent to a subjunctive conditional asserted tomorrow about the same event, i.e., 'If had rained, the match would be cancelled' (Adams, 1975: 103). The same explanation holds for the 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 in different moments. The reason why (2a) only admits a conspiracy reading is that it reflects this assumption.

However, these differences have no logical significance, since the link between indicative and subjunctive conditionals is just a consequence of a more general principle about truth value links. The principle states that a proposition expressed by 'An event of the type K is occurring' asserted in the present has the same truth conditions of the proposition expressed by 'An event of the type K occurred one year ago' asserted one year afterwards (Dummett, 2004: 75). We

have independent reasons to think that way. This becomes clear when we consider non-conditional propositions, for instance:

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

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

The reasons to accept (1b) can be the news that Kennedy was killed on November 22, 1963. However, the reasons to accept (2b) can be the belief that someone would kill Kennedy on November 22, 1963. However, it is implausible to think that the truth conditions of (1b) are distinct from (2b), since they are both made true by the occurrence of the same event, the killing of J. F. Kennedy on Dallas, November 22, 1963.

The different modes and tenses of conditionals express the speaker's epistemic situation, not the truth conditions of conditionals. Thus, it is not just (1a)-(2a), but also (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 the ones presented in (1a)-(3a), since they involve specific contextual elements. If we include these contextual elements in its formulation, we will obtain a conditional that is independent of the speaker's epistemic situation in its formulation:

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

(1a)-(3a) are logically equivalent to (4a). The truth conditions of (4a) are independent of the fact that the grammatical modes of (1a)-(3a) are appropriate in different contexts, given the speaker's epistemic situation.

This suggests that the truth conditions of conditionals are independent of their grammatical modes (indicative and subjunctive), and independent of the different expressions employed in the antecedent and consequent, and their auxiliaries ('if', 'had', 'were', 'will', 'would', etc.), since they are just extra-propositional constituents used to express the speaker's assumptions during the assertion. The Kennedy examples seem logically different only because we are induced by these grammatical elements to confuse speaker's assumptions (an epistemic element) with the truth conditions of a conditional (a semantic element).

That these extra-propositional constituents have a role in expressing speakers' assumption become evident when we compare its use in questions. Suppose that someone asks the question: 'John did not go, did he?' We can infer from this question that he believes that John did not go. On the other hand, if he asks the same question in a slightly different way 'Surely John went, didn't he?', then we can infer that he believes that John did go. If John did go, the correct answer to both questions is 'yes', even if the first question was asked under 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 answer. In the same way, suppose that we are considering John's chances on 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 didn't enter. This doesn't imply, however, 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 don't require a distinct logical treatment (Ayers, 1965: 353).

This link of truth values is also supported by the way we employ the 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 don’t think that the indicative conditional has a different truth condition when is 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 criticisms. The argument that (1a)-(3a) express the same conditional in distinct moments presuppose that the moments must be the ones suggested by the argumentation, i.e., (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 of time, since conditionals can have different temporal directions. A subjunctive conditional can be about the present, e.g., ‘If Her Majesty had been here now she would have been revolted’, or about the future, e.g., ‘If the auditors had come tomorrow they would have found everything in order’ (Dudman, 1984: 146). These examples eliminate any hope that we can 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 subjunctives in general, in the examples mentioned we have restrictions that justify our interpretation. (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. (1a) is entailed by the fact that someone killed Kennedy. 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 many ways of dealing with this contrary intuition. The conspirator thinks 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, it would not be killed by anybody else. However, this reasoning is incoherent, because it assumes that Oswald is the only killer and at the same time it refuses the conditional for considering a scenario in which Oswald is not the killer. It is also arguable that the objection involves another incoherence, since it admits 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. In fact, this argument is generally presented as evidence favourable to the material account (Johnston, 1996: 100). Therefore, it would be incoherent to accept this consequence, but then insist that they are

inconsistent 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 accusation against the thesis that indicative and subjunctive conditionals are appropriate in different contexts given the speaker's epistemic situation is that they are incompatible with the way we use indirect discourse. Suppose someone said (1d) 'I'm awake'. The indirect reference of (1d) will 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 with respect to 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 world 'killed' places the killer in the past.

The argument must be criticised 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 be also acceptable in (5b). Moreover, it is also arguable that we can adopt a distinct manner of making the indirect speech that would not involve any counter-intuitive 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 22 November, 1963'.

Thus, to sum up: there are not 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 express 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 not logical significance with other connectives, they should not affect the truth conditions of conditionals either. The Apartheid thesis is unjustified.

6. POSSIBLE WORLD THEORIES

Another reason why the material account of subjunctives is still dismissed out of hand is the popularity of possible world theories that are tailor-made to accommodate some of our modal intuitions about subjunctive conditionals. For instance, Stalnaker (1968: 102) offers an alternative in which to establish the truth value of $A \rightarrow B$ we need to consider the possible world that is most similar or closest to the actual world in which A is true, and then consider if B is true in that world. A conditional is true only if B is true in this possible world, otherwise, is false. If the closest A -world is the actual world, then we consider if B is true in the actual world¹⁹. If A is a necessarily false proposition, the conditional is vacuously true.

These truth conditions allow us to explain why some subjunctive conditionals with false antecedents are more plausible than others. This hypothesis predicts in accordance with our modal intuitions 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; whereas 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. If the possible world account can accommodate our modal intuitions regarding subjunctives so elegantly, no wonder that a material account that is ridden with counter-intuitive aspects is so promptly ignored. From the point of view of the critics, a material account of subjunctives would at best inherit the legion of problems that the material account of indicatives already has. It would not be worth the trouble. However, possible world theories also have many problems that should be properly considered before any decision is made about the supposedly demerits of the material account of subjunctives.

First, it is important to consider that possible world theories also have its own counter-intuitive aspects, since 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 worlds, when the antecedent is true, a truth-functional calculus is still used in order 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.

The idea that possible world theories capture our modal intuitions in all cases turn out to be an exaggeration on a closer look. These theories are fundamentally unequipped to explain the truth conditions of Dutchman conditionals, i.e., conditionals that are incompatible with the truth of the antecedent. The conditional ‘If John’s speaking the truth, I’m a Dutchman’ is accepted under the assumption that John is lying, but in the closest world in which John is speaking the truth, I’m not a Dutchman. Possible world theories predict that every Dutchman conditional is false, but there is no independent reason to accept this prediction. Again, the

¹⁹ David Lewis (1973) offers a distinct version inspired by the same idea. The difference in this case 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, he thinks that this explanation must be provided only to subjunctive conditionals, since he thinks 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 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 on 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 it as vanilla possible world semantics or simply possible world account.

material account has the upper hand, since it can accommodate with ease these cases: Dutchman conditionals are true when they have false antecedents.

Possible world theories can also be accused of being motivated by an illusion associated with the logical form of conditionals. We are naturally inclined to confuse the truth conditions of $A \rightarrow B$ with the inferential jumps suggested by its logical form. Since the propositional form of $A \rightarrow B$ suggests that B can be inferred from the assumption of A , it is natural to think that $A \rightarrow B$ is true when B is true in the closest A -world. That this is a confusion becomes clear when we consider that other propositional forms, e.g., $\neg A \vee B$, can have the same inferential jumps of $A \rightarrow B$, but do not cause in us the same modal intuitions. The reason is that unlike $A \rightarrow B$, the logical form of $\neg A \vee B$ does not suggest any inferential jump from A to B , even though they do 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. |

If the truth of $\neg A \vee B$ doesn't require an evaluation of the closest A -world, then the truth of $A \rightarrow B$ doesn't require an evaluation of the closest A -world. The only reason to think that conditionals are any different is its misleading grammatical and logical form, which suggests that its 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 apparently they allow us to freely navigate in a vast ocean of possible worlds in order 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, etc. 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 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 it.

However, this expressive power of possible world theories is their main strength but also their main weakness, since they will make logic hostage to different modal intuitions that are in constant conflict and pulling in different directions. In order to understand that, we need to consider a few things first. It is obvious that 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 iff the closest A -world is a B -world²⁰. 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 that 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, the conditional is true; otherwise, is

²⁰ Or iff all the closest A -worlds are B -worlds, if you choose Lewis over Stalnaker.

false. Thus, it becomes possible to test or verify whether the pattern expressed by the conditional would realise in the proper circumstances by means of an alternate.

So far so good. The problem starts when the pattern is satisfied in many other possible worlds. Possible world theories seem incapable of satisfying our intuitions about tautological conditionals that are analytic, i.e., conditionals such as ‘If that 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 whether the consequent is true seems farfetched, since these conditionals are true by definition and we can recognise their truth by the meaning of the terms involved. We do not consider any possible worlds at all in ascertaining its truth (Hunter, 1993: 289). Thus, it is implausible that we would need a possible world semantics to express its related modal intuitions.

One could expect then that the semantics must be fine-tuned to fit the stronger or weaker patterns of each conditional. Since analytic conditionals express a conceptual necessity that is not ensured only by the closest worlds, the possible world parameter should be modified accordingly. Thus, for instance, it could be argued that the conditional $A \rightarrow B$ is true iff B is true in all A -worlds, not the closest A -worlds. But this would be not enough and subsequent modifications would be needed if the relations would involve impossibilities, e.g., the conditional ‘If 16 were divisible by 9, it would be divisible by 3’ intuitively express a conceptual necessity, but there is no possible world in which 16 is divisible by 9. Hence, another semantics would be needed to include impossible worlds²¹.

It could also be argued that the semantics should be modified to fit in our modal intuitions in epistemology. Thus, some modal intuitions in the analysis of knowledge led some philosophers to demand a different possible world theory. Vanilla possible world theories imply that any conditional with true antecedent and consequent are true, but these truth conditions cannot do justice to Nozick’s analysis of knowledge. Nozick (1981: 18) employs new clauses as substitutes for justification in an analysis of knowledge. His explanation is that a subject S knows a proposition P iff:

- (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 counter-examples, 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 the usual possible world theories, (4) is entailed by (1) and (2). We can consider (3) and (4) independently of the truth values of its components, but the only way to do that is to assume that their truth conditions must be distinct. Nozick argues that the truth of the conditional (3) must involve not the closest P -world, since this would be the actual world, but an appropriate range of possible worlds close to that one in which P is true. S will know P if an appropriate range of possible worlds close to that one 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). In other words, the use of possible world semantics implies that a whole new logic must be designed to fit in Nozick’s intuitions about the nature of knowledge.

Thus, the initial suggestion that possible world theories should allow us to track a pattern across a suitable range of possible worlds end up in the Babylonian conclusion that we need to develop as many versions as there are different modal intuitions and patterns expressed by conditionals. This rationale, naturally, can only be satisfied at the expenses of logic’s generality

²¹ See Sorensen (1996), Nolan (1997) and Zalta (1997).

and practicality, since the entire logic edifice will become hostage to the patterns a single conditional sentence will eventually express. It seems absurd that we should choose between different logics before formalising a conditional sentence in the same way one can choose between different clothes before going out, but that is what the pattern of ‘follow a modal intuition then build a new possible world semantics around it’ will ask of us. We shouldn’t choose three different types of logic because we are evaluating two examples of tautological conditionals or discussing epistemology. In the eagerness to do justice to our modal intuitions, the task of determining the truth conditions of conditionals was hijacked by other theoretical interests that goes beyond the task of expressing the truth conditions of conditionals.

This is the main flaw of possible world theories and it is perceived by its proponents as its greatest strength. The material account is disregarded precisely due to the opposite reason, since it provides conditionals with truth conditions that are entirely reliant on truth values combinations, and this flaw is perceived by its supporters as its strongest point, for it provides unequivocal and clear truth conditions that will not distract us with non-logical considerations. So, either possible world enthusiasts are not interested in mere logic or they have a different view of what logic should aim for. It is more likely the former. The discussions involving possible worlds are like science fiction. They are more imaginative and free-float than regular logical issues, which seem almost mundane in comparison. But these imaginative discussions are always related to epistemological and metaphysical subjects and in most cases have nothing to do with the nature of validity.

Another problem that should not be ignored is that we should make a distinction between the ability of possible world semantics to track different patterns across possible worlds and the 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, because it is circular. In order to determine if we should accept or refuse a conditional $A \rightarrow B$, we consider what are the available reasons to accept it. The vanilla possible world account, however, suggests that we should do something different, namely, to consider whether B would be true in the closest A -world. This explanation, however, inverts the order of acceptance, for we are only able to decide 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. Thus, the possible world semantics only allows us to express some of our modal intuitions.

The truth conditions can be applied effortlessly to conditionals that are known to be true due to independent reasons. I know that given standard conditions, a person will get an electric shock after touching a live wire. Given those assumptions, I would be willing to infer the consequent after the hypothetical assumption of the antecedent, but only because I already decided that the conditional was true 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.

I cannot tell if Bizet would be Italian or if Verdi would be French under the hypothetical assumption that Bizet and Verdi are compatriots because the available evidence does not point in one direction or the other (Quine, 1982: 23). This occurs because possible world theories place an enormous epistemic burden in our analysis of conditionals, for we need to imagine and provide reasons that justify what would be the truth values combination given the matters of fact in a different world. This is one of the most appalling aspects of possible world theories evidenced by Lewis’ criteria of similarity. In order to decide if a world w_1 is closer to the actual world than w_2 , we need to consider whether one of them contains a large miracle, exactly

resembles the actual world for more time, contains a larger number of small miracles, and, finally, which has a greater degree of (imperfect) similarity to the actual world. The beauty of the material account is that you don't need to embark on the impossible task of finding out what goes on in other words. Instead, we can rely on the consistency in truth values attribution to determine whether an argument preserves the truth of the premises or not. If each propositional variable assumes the same truth value throughout the argument, you can determine whether there is any possible combination whether they fail to preserve the truth or not. It is simple.

There are other grievances that allow us to question the ability of the possible world account even if they should be understood in this limited role. The fact that some of the paragons of the possible world account openly admit that they are only 'modest realist', that different ways of determining the similarity relation are context dependent, and that the truth conditions for subjunctives have great potential for indeterminacy, does not sound reassuring. In fact, the truth conditions of a conditional in a possible world account are not only context dependent, but subjective. In a possible world theory, $A \rightarrow B$ is true if B is true at the closest A -world (or at all the closest A -worlds), but the problem is that 'closest A -world' is just a synonymous with 'belief system updated by the hypothetical addition of A '. This is not surprising since these truth conditions were motivated by the 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 . But 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 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. CONCLUSION

I argued that the main reasons to think that subjunctive conditionals are not material are unjustified. The modal intuitions associated with subjunctive conditionals are no different from the ones associated with indicative conditionals. If the latter can be explained away by pragmatic means, the same could be said about the first ones. The truth-functional theorist cannot deny this consequence without being incoherent. Besides, the principles that entail the material account are still valid when they employ subjunctive conditionals. This shows that the thesis that subjunctive conditionals are material and the thesis that indicative conditionals are material are intertwined. You can't accept that indicative conditionals are material without accepting that subjunctive conditionals are material. If the last hypothesis is indefensible, so is the first one. Conversely, if the first hypothesis is plausible, so is the last one.

I also criticised the prevailing reasons to deny the viability of material account of subjunctives, which includes both the examples that motivate the Apartheid thesis, and the possible world theories. And while a knockdown argument that settles the discussion about

these questions is not something that seems likely in philosophy, I believe I have at least presented a plausible argument for the thought that they could be overcome by the material account alternatives.

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.
- 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.
- 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 (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: 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, 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.
- Woods, M. (1987). *Conditionals*. Oxford: Clarendon Press.