# A CONTEXTUALIST DEFENCE OF THE MATERIAL ACCOUNT OF INDICATIVE CONDITIONALS

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ABSTRACT

The material account of indicative conditionals faces a legion of counterexamples that are the bread and butter in any entry about the subject. For this reason, the material account is widely unpopular among conditional experts. I will argue that this consensus was not built on solid foundations, since those counterexamples are contextual fallacies. They ignore a basic tenet of semantics according to which when evaluating arguments for validity we need to maintain the context constant, otherwise any argumentative form can be rendered invalid. If we maintain the context fixed, the counterexamples to the material account are disarmed. Throughout the paper I also consider the ramifications of this defence, make suggestions to prevent contextual fallacies, and anticipate some possible misunderstandings and objections.

## 1. IT'S ALL ABOUT CONTEXT

One of the most dramatic scenes of Shakespeare's 'The Merchant of Venice' is the court battle between Antonio and Shylock. Shylock, the Jewish moneylender, is asked by Antonio to give a loan to his dear friend, Bassanio. Shylock is reluctant, but agrees to grant the loan to Bassanio with the condition that 'if Bassanio is unable to repay it at the specified date, I may take a pound of Antonio's flesh'. Antonio signs the contract without taking the threat seriously. After an unfortunate turn of events, Antonio's ships are reported lost at sea, thus leaving Antonio without the means to repay the loan, whereas Shylock's daughter, Jessica, runs away with a Christian and converts herself, while taking a sizeable part of Shylock's wealth with her. This confluence of events makes Shylock hell-bent on revenge against the Christians. Antonio is then brought before court. The most important part of the act is when Portia defends Antonio in court, and manage to save him with the diabolic argument that since the contract called only for a pound of flesh, Shylock cannot shed one single drop of Antonio's blood, under the penalty of having his lands and goods forfeited under Venetian laws. Antonio is thus safe from Shylock's vengeance. What happened? How Portia managed to interpret the contract against its intended meaning and still get away with it? She committed a contextual fallacy. The conditional expressed by the contract, 'if Bassanio is unable to repay it at the specified date, I may take a pound of Antonio's flesh', was established in a context of standard conditions, such as that of a removal of a pound of flesh is accompanied by blood. This contextual element is wilfully ignored by Portia, who focused exclusively on the literal aspect of the contract at the expense of everything else.

The material account of indicative conditionals has the same fate of Shylock's contract, since it is refused by arguments that rely on contextual fallacies. These counterexamples will be presented in section 2, and rebutted as contextual fallacies in section 3. The potential

causes of the higher or lesser propensity to context shifting involving argumentative forms with conditionals are also discussed. This contextualist defence has theoretical ramifications that are considered in section 4: a material account of subjunctives, the inherently flaws of possible world theories, the problems of the pragmatic explanation of classical argumentative forms as reasonable inferences, and the rebuttal of the counterexamples of the conditional analysis of dispositional properties and the counterexamples to the transitivity of causality. In section 5, it is clarified in which way the contextualist defence distinguishes itself from approaches that rely on ellipses, the defeasible character of reasoners' beliefs, speaker's assumptions, or linguistic notions such as common ground. Some suggestions to prevent context shifting are considered in section 6: the inclusion of preservation of context in the notion of deductive validity, the explicitness of the temporal indexers assumed in the propositions, and a choice of verbs in the formulation of sentences that preserve the temporal and other asymmetrical aspects assumed in the context. In section 7, some objections advanced against the contextualist defence are answered. They include examples of intuitively invalid arguments that apparently cannot be explained away by appeals to context shifting, examples of intuitively valid arguments that nevertheless shift the context, and conceptual objections about the efficacy of the contextualist approach. Finally, it's suggested a criticism of the current shape of the debate and its methodological assumptions.

## 2. THE MATERIAL ACCOUNT UNDER SIEGE

The material account asserts that '$\rightarrow$' and '$\supset$' are logically equivalent[1]. Counterexamples against this claim are legion. The following argumentative forms have been the focus of most criticisms[2]:

*The First Paradox of Material Conditional* (FPM): $\neg A \vDash A \rightarrow B$

*The Second Paradox of Material Conditional* (SPM): $B \vDash A \rightarrow B$

*Antecedent Strengthening* (AS): $A \rightarrow B \vDash (A \& C) \rightarrow B$

*Contraposition* (CON): $A \rightarrow B \vDash \neg B \rightarrow \neg A$

*Hypothetical Syllogism* (HS): $A \rightarrow B,\ B \rightarrow C \vDash A \rightarrow C$

The infamous (FPM) has counter-intuitive instances such as: 'John did not drink poison. Therefore, if John drinks poison, it will be good for his health'. The conditional in the conclusion will be vacuously true simply because John did not drink poison, but this is implausible since in usual circumstances the act of drinking poison is not only bad for John's healthy, but fatal, since it would lead to his death.

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[1] I will adopt the notation where '$\rightarrow$' stands for indicative conditionals, '$\supset$' stands for material conditional and '$\vDash$' stands for entailment. All argumentative forms that are mentioned more than one time 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. I will use the capital letters *A*, *B*, *C*…. 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.

[2] That is not to say that they do not also have intuitive instances, see Allott and Uchida (2009b: 2); Boh (1993: 4); Clark (1974: 78), Farrell (1975: 301); Hunter (1993: 288); Newton-Smith (2005: 25); Snipes (1977: 249).

It's common knowledge that (SPM) also has counter-intuitive instances. Suppose that I glance on the newspaper the results of a soccer match. Knowing that the match took place and accepting the material account, I feel confident to assert 'If the players broke their legs, the match was not canceled'. This is counter-intuitive because in any circumstances where the players broke their legs (for instance, in a terrible accident), the match would be cancelled. The truth of the antecedent would lead to the falsity of the consequent.

Now, consider (AS). This argumentative form has counterexamples that are too familiar: 'If the match is struck then it will light. Therefore, if the match is struck and it is held under water, then it will light.'[3] In standard circumstances, the premise is true, but the conclusion is false. If the match is struck while it is soaked, it will not light.

There are also counterexamples against (CON). Suppose that the following inference is uttered while one waits for the judges' decision: 'Well, if he didn't win, he certainly tried his hardest. Therefore, if he didn't try his hardest, he won.'[4] One could accept the premise, but reject the conclusion.

(HS) has been put in check by counterexamples such as: 'If Brown wins the election, Smith will retire to private life. If Smith dies before the election, Brown will win it. Therefore, if Smith dies before the election, then he will retire to private life.' One could plausibly accept both premises, but reject the conclusion. It is absurd to suppose that Smith could decide to retire *after* he died[5].

The counterexamples discussed above are directed to the counter-intuitive aspects of classical propositional logic that involve material conditionals, but they can also involve classical predicate logic. The following counterexample involves two conditionals with existential quantifiers which despite being regarded as logically equivalent by classical logic are not plausibly viewed as such[6]. Here are the conditionals:

(1a) Some married woman will commit suicide if her husband fails in business.
(2a) Some married woman will commit suicide if every married woman's husband fails in business[7].

Their respective logical forms in classical logic are:

(1) $\exists x (Fx \supset Gx)$
(2) $\exists x ((\forall y Fy) \supset Gx)$

What makes (1a) true? The fact that some married woman will commit suicide if her husband fails in business. But when it comes to the truth of (2a), intuitions point towards a completely different scenario. What would make (2a) true is a situation where some woman will commit suicide when a massive business failure takes place (maybe a crash in the market). The woman in (2a)—it seems—would not even dream of the idea of committing suicide were her husband the only one who fails in business. Hence, it is not plausible to hold that (1a) and (2a) have the same truth conditions. Be this as it may, once we accept classical logic no other

[3] Blum (1986: 111).
[4] Skyrms (1978: 178).
[5] Adams (1965: 166).
[6] Read (1992: 5). The objection was inspired by an argument made by Peirce.
[7] Read (1992: 5).

option is open to us: we must take (1a) and (2a) as logically equivalent—and hence as having the same truth conditions. Thus, this example is apparently a good reason to reject the material account.

The counterexamples mentioned above are just a small sample of an avalanche of cases presented in the literature. These counterexamples are staggering due to their sheer variety alone. This is evidenced by William Cooper's impressive survey[8] of twenty counterexamples, being ten examples of intuitively invalid arguments that are valid according to the material account, and ten examples of intuitively valid arguments that are invalid according to the material account. Clarence Lewis[9] also made a whopping compilation of thirty-two counterexamples. In reality, if we consider that we can formulate infinite argumentative forms using formal logic, it would not be an exaggeration to claim that there are an infinite number of classical argumentative forms that can be build upon these counter-intuitive aspects and, therefore, the possibility of an infinite number of counterexamples.

This makes the task of an individual criticism of each and every counterexample an impractical task. Rather, a defence of the material account should aspire to be general and systematic. Instead of discussing the peculiarities of individual counterexamples, the defence of the material account should look for similarities in an attempt to classify these counterexamples into general groups, which will then require a general explanation where they are interpreted as reasoning mistakes. The defence of the material account should then be judged by whether its attempt to debunk the counterexamples of each group as reasoning mistakes is convincing or not. This way of approaching the discussion bypass the problem of potential infinite number of counterexamples, since reiterated variations of the same counterexamples still belong to the same group. Here I will use this approach to explain the counterexamples mentioned above as belonging to one particularly important group: the ones motivated by contextual fallacies.

## 3. CONTEXTUAL SLEIGHT OF HAND

It is a basic tenet of semantics that when evaluating arguments for validity we need to maintain the context constant[10]. The context consists in a list of features that involve background facts (location, time, natural laws, actual events), the world that is used as parameter to evaluate the truth value of a proposition (the actual world, the closest world where such and such is the case, etc.) and the domain-restricting functions[11]. These contextual features affect the truth value of the premise(s) and conclusion, and if ignored during the evaluation of an argument they can render any argumentative form invalid. It is a contextual fallacy. Consider this plausible instance of *Modus Ponens* (MP): 'If it's raining, the streets are wet. It's raining. Therefore, the streets are wet.' This argument can be rendered invalid by changing the context. If the premises' truth values are evaluated on Wednesday and the conclusion on Thursday, the premises would be true, but the conclusion would be false[12]. It is not surprising then that one of the main explanations for the counterexamples to (MP)

[8] Cooper (1968).
[9] Lewis (1913).
[10] Brogaard & Salerno (2008); Gauker (2005: 94); Kaplan (1989).
[11] Brogaard & Salerno (2008: 41).
[12] Brogaard & Salerno (2008: 40–41).

presented in the literature[13] is that they result from an illicit context in the evaluation of the argument[14]. But there is no need to defend (MP) 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* (CE). Consider the following example: 'It's raining and the streets are wet. Therefore, the streets are wet.' This argument could be said to be invalid if we evaluate the premise's truth value on Wednesday and the conclusion's on Thursday. That won't do.

This fallacy is also responsible for counterexamples against the commutativity of conjunctions. Some examples suggest that it is not safe to infer *B&A* from *A&B*, since the order of the conjunctives is relevant to the truth of the conjunction. To cite just one example: 'John gave a presentation and died. Therefore, John died and gave a presentation.' But this is a problem only if we assume that the temporal order of the background facts is inverted when the proposition is inverted in the conclusion. The background fact that John died after the presentation is not abandoned if you mentioned that John died before mentioning that he gave a presentation[15]. Or consider the counterexample against biconditionals: 'The cactus flowers if and only if it rains. Therefore, it rains if and only if the cactus flowers.'[16] The premise is plausibly true, but the conclusion seems false, since it inverts the causal process. The cactus flowers *because* of the rain, but it is not responsible for the rain. However, this conclusion only seems false if we ignore the relevant background facts. The conclusion merely states that propositions about the occurrence of both events must have the same truth values, since both events occur in the actual world. It does not invert the order of both events simply because the conclusion inverts the order of the premise.

One of the most striking aspects of maintaining the context fixed is that it enable us to block the main counterexamples to the material account[17]. Consider the counterexample to (FPM) mentioned before: 'John did not drink poison. Therefore, if John drinks poison, it will be good for his health'. The conclusion is false in a context where the antecedent is true, but I cannot assume that the conclusion's antecedent is true without illicitly shifting the context and disregarding that the antecedent was false in the premise. The fact that the act of drinking poison would lead to John's death is irrelevant since John did not drink poison.

Now, let's get back to the counter-intuitive instance of the (SPM): 'The match was not canceled. Therefore, if the players broke their legs, the match was not canceled'. This example can be explained in a similar way. The conclusion only seems false if we consider a context where the antecedent is true, but the conclusion only follows from the premise because the antecedent is false. The perception that the conditional is false when the antecedent is true is unmotivated, because the antecedent is false in the context of evaluation.

The counterexample to (AS) is also guilty of illicit context shifting: 'If the match is struck then it will light. Therefore, if the match is struck and it is held under water, then it will light.' This counterexample does not work, since the premise is only true when there are normal background conditions that ensure that the match will light when stroke, i.e., it is dry, there is the presence of oxygen in the atmosphere, etc. However, the truth of one the conjunctives of the conclusion's antecedent is inconsistent with one these conditions, namely, that the match

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[13] McGee (1985); Lycan (1999).
[14] Sinnott-Armstrong (1999).
[15] See also Gillon (1995) for a different objection.
[16] Sanford (2003: 203).
[17] Allott & Uchida (2009a; 2009b); Chakraborti (1998: 498–501); Lycan (1999: 133–136).

is dry. Thus, in the only context where the premise is true, the background conditions necessary for the causal relation are maintained, but in this context the conclusion is vacuously true due to the falsity of the antecedent.

Now, consider the supposed counterexample to (HS): 'If Brown wins the election, Smith will retire to private life. If Smith dies before the election, Brown will win it. Therefore, if Smith dies before the election, then he will retire to private life.' The counterexample does not work, since the premises and the conclusion are not evaluated in the same context. Suppose that the conclusion is false, i.e., that it has a true antecedent and a false consequent. In this case, Smith will not be able to retire, because he will die before the election takes place. The first premise has a false consequent and the second premise has a true antecedent. It remains to be seen whether Brown will win the election in this context. If he does, the first premise will have a true antecedent and a false consequent, and the second premise must be true, since the antecedent is true and the consequent is true. Therefore, at least one of the premises will be false. There is no counterexample.

On the other hand, suppose that Brown will not win the election even if Smith dies—they are not the only candidates. In this case, the first premise will be vacuously true, since it will have a false antecedent; however, the second premise will be false, since it will have a true antecedent and a false consequent. This is not a circumstance in which the premises are true and the conclusion is false.

The counterexamples to (CON) also incur in the same contextual fallacy: 'Well, if he didn't win, he certainly tried his hardest. Therefore, if he didn't try his hardest, he won.' The conditional could be interpreted as 'If he didn't win, at least he tried his hardest', since the premise is accepted given the background fact that its consequent is true, even though the truth value of the antecedent is still open to debate. However, the conclusion seems false since we can consider a possible world in which he didn't try his hardest, but didn't won. This alters the background facts of the premise, which depends on the condition that he tried his hardest.

The counterexample involving existential quantifiers can be explained in the same fashion. The claim that (1) and (2) are not logically equivalent only holds because they are evaluated in different contexts. But their apparent logical difference vanishes once the context is held fixed. Before addressing the problem, and for clarity's sake, let me just change the order of the if-clauses in (1a) and (2a):

> (1a*) If her husband fails in business, some married woman will commit suicide.
> (2a*) If every married woman's husband fails in business, some married woman will commit suicide.

In order to dismantle the counterexample, we need show that (1a*) *plausibly* entails (2a*) and (2a*) *plausibly* entails (1a*).

Consider a case in which (1a*) entails (2a*). Suppose the relevant woman is someone who would be so ashamed and dishonoured of being married with a failed businessman that she would take her own life in case her husband fails in business. At some point in time, her husband fails in business and she commits suicide as a result. (1a*) is true. Is (2a*) also true in this context? Yes, it is. If the woman would commit suicide in the event her husband fails in business, she would too commit suicide in case *every* married woman's husband fails in business: when all married woman's husband fails in business, our hypothetical woman's

husband fails in business as well. This is a case where (1a*) not only entails (2a*), but *plausibly* does so. Why does that happen? In virtue of the context being held fixed: (1a*) and (2a*) were asserted, and we have determined their truth values, under the same facts and states of affairs.

Now, (2a*) would also *plausibly* entail (1a*) in this very same context; a context where there is a woman who would be so ashamed and dishonoured of her husband business failure that she would commit suicide in the event her husband fails in business. In this context, the antecedent in (2a*) plausibly entails (1a*)'s antecedent: if every businessman fail, a particular businessman fails. Besides, when the antecedent of (2a*) is true, the consequent of (2a*) cannot be false. Therefore, (2a*) is true in our context. Since the consequent of (2a*) and (1a*) are one and the same, the truth of (2a*)'s consequent entails that (1a*)'s consequent is also true. Hence, if (2a*) is true, (1a*) is true.

The same sort of objection applies to other examples. Here is an adaptation of another example[18]: Consider a sweepstake in which anyone can participate by purchasing a stake of £1. Participation is not mandatory, and there is a limit of 1000 participants. The winner receives the sum of the total number of stakes bought. Given this scenario, take the following two conditionals:

(1b) Someone will win £ 1000, if he or she takes part.
(2b) Someone will win £ 1000, if everyone takes part.

Changing the order of if-clauses:

(1b*) If he or she takes part, someone will win £ 1000.
(2b*) If everyone takes part, someone will win £ 1000.

Classical logic says that (1b*) and (2b*) are logically equivalent. Yet, given what we know about the sweepstake, (1b*) seems false whereas (2b*) seems true. They are not *plausibly* viewed as logically equivalent[19]. As with the first case considered in the paper, I think the intuition that (1b*) and (2b*) aren't plausibly viewed as logically equivalent springs from an illegitimate shift of the context where (1b*) and (2b*) are asserted. My argument against this counterexample is basically the same one I used earlier: show that once the context is held fixed (1b*) *plausibly* entails (2b*) and (2b*) *plausibly* entails (1b*).

The counterexample assumes that if we consider the assumptions about the sweepstake, (1b*) seems false. The idea is that the sole fact that he or she takes part in the sweepstake is not sufficient for someone to win £ 1000 priz[20]e. But this is too fast. We don't know how many people are taking part of the contest. Suppose our participant takes part alone. In that circumstance, and with the assumptions concerning the rules of the bet in hand, we would not accept the consequent. Thus, (1b*) would be false. How about (2b*)? Well, that too depends on an information we don't have, namely how many people everyone amounts to. If our domain includes 700 people, (2b*) is also false. But so is (1b*). If our domain includes 1000 people, then (2b*) is true—and so is (1b*). Thus, the counterexamples are disarmed.

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[18] Read (1992: 10).
[19] Read (1992: 10).
[20] Read (1992: 10).

One might have expected that since the main counterexamples against the material account involve context shifting, the absence of contextual fallacy is also behind examples that support the material account, and that is exactly what happens. For instance, the conditional 'If Oswald did not kill Kennedy, someone else did' is a material conditional, since given the known facts, the conditional is true if either Oswald was the murderer, or if someone else was the culprit[21]. An illicit contextual change is not even considered in this case because it would only be plausible if these assumptions were not known facts.

The importance of a fixed context also explains why is usually accepted that conditionals in mathematics are material. In mathematics, conditionals lack the features that are prone to context shifting such as temporal flexion and causal connections[22]. Consequently, an argument in mathematics is evaluated using a single context-set, but in evaluating arguments in general; especially the counter-intuitive instances presented as counterexamples, logicians tend to change the background facts in the passage of the premises to the conclusion.

This concession puts some pressure on alternatives to the material account, for any acceptable theory of indicative conditionals must be simplified to the material account in mathematical contexts. After all, it cannot be ignored that the language of mathematics is in continuity with ordinary language, since the mathematical activity occurs in natural language[23]. Thus, since mathematical conditionals are conditionals of natural language, a proper explanation of conditionals must be a proper explanation of mathematical conditionals[24]. In order to avoid the material account it would be needed to argue that mathematical conditionals are only material because mathematical contexts have special features, but this is implausible since we understand the use of conditionals in mathematics

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[21] The proof is as follows: there is nothing strange in saying that this conditional depends on whether Kennedy was killed, and thus on whether Kennedy was killed by someone. If the logical form of the proposition 'Someone killed Kennedy' is represented as $(\exists x)Fx$, the logical form of the proposition 'Oswald did not kill Kennedy' can be represented as $\neg Fa$. If we apply the existential instantiation rule to the first propositional form, we have $Fb$, and this together with $\neg Fa$ give us $(a \neq b)$ by indiscernibility of identicals. The conjunction then gives us $Fb \ \& \ (a \neq b)$ and by applying the existential generalisation we have $(\exists x)Fx \ \& \ (a \neq x)$, which is the logical form of the consequent of the conditional. Thus, the conditional is entailed by its consequent. Now suppose that the antecedent of the conditional is false. Thus, is true that Oswald killed Kennedy, and, therefore, that someone killed Kennedy. Therefore, the conditional will be again true. Thus, either Oswald did not kill Kennedy or someone else did. See Mellor (1993: 238–239).

[22] Orayen (1985: 235–236).

[23] This hypothesis is also supported by the fact that there is little doubt that conditionals in math are material, since it can be proved that every tautological conditional is material, and a true conditional in mathematics is a tautology. The proof is divided in two phases. First, we show that if $A \supset B$ is a logical truth, so is $A \rightarrow B$:

| | |
|---|---|
| 1. $A \supset B$ is a logical truth | assumption |
| 2. $A \vDash B$ | 1, conditional proof |
| 3. $A \rightarrow B$ is a logical truth | 2, conditional proof |
| 4. $\vDash A \supset B \ \vDash A \rightarrow B$ | from 1–3 |

Now we show that if $A \rightarrow B$ is a logical truth, so is $A \supset B$:

| | |
|---|---|
| 5. $A \rightarrow B$ is a logical truth | assumption |
| 6. $A \vDash B$ | 5, conditional proof |
| 7. $A \supset B$ is a logical truth | 6, conditional proof |
| 8. $\vDash A \rightarrow B \vDash A \supset B$ | From 5–6 |

Fitelson (2008: 2)

[24] Barwise (1986: 21).

by following our ordinary use and mathematical conditionality is expressed by using standard conditional forms of a given natural language[25].

It is not surprising then that the few dissenting voices[26] from the consensus that conditionals in mathematics are material try to present counterexamples based on an illicit contextual shift. Imagine the following situation[27]: a mathematician submits a paper about Banach's spaces, and after proving some theorems, he concludes the paper with a conjecture and a footnote that states that 'if the conjecture is true, then the first order functional calculus is complete; whereas if it is false, then it implies that Fermat's last conjecture is correct.' The editor deems the paper reasonable, but considers the footnote surprising, since he is incapable of understanding what is the connection between this conjecture with the other parts of mathematics. The mathematician replies that he uses the 'if, then' and the 'implies' in the way they have been used by logicians. Since the first order functional calculus is complete, and this is a necessary truth, anything can imply its truth. If the conjecture is false it will be necessarily false and thus it implies anything. To this the editor replies that despite of what logicians say about the notions of 'if, then' and 'implies', the standards of the journal demands that the antecedent of 'if, then' is relevant to the conclusion drawn, and that the author has provided no evidence that the conjecture about Banach's spaces has any relevance to the completeness theorem or the Fermat's conjecture.

Perhaps the notion of vacuous truth could also be of some help to the editor. No conclusion about the completeness theorem or the Fermat's conjecture can be drawn from the conditionals mentioned on the footnote. The conditional 'if the conjecture is true, then the first order functional calculus is complete' can only be used to infer the conclusion that the first order functional calculus is complete, because its truth is already admitted when the premise is accepted. The conditional 'if this conjecture is false, then Fermat's last conjecture is correct' cannot be used to infer that Fermat's last conjecture is correct precisely because the conditional is only accepted when the antecedent is false. To think otherwise would amount to a contextual fallacy.

The contextualist defence explains the attraction behind Jackson's defence of the material account[28]. He argued that paradoxical conditionals $A \rightarrow B$ seem false when $B$ is not robust with respect to $A$, i.e., when $\Pr(B)$ would not be high after learning that $A$. In this sense, $A \rightarrow B$ seems false if it cannot be employed on a (MP) inference. This intuition can be easily explained as a matter of context shift: $A \rightarrow B$ may seem false if we ignore that $A$ is false in the actual context and evaluate it in a different context where $A$ is true.

Now, one puzzling aspect of the context shifting phenomenon is that only a few argumentative forms induce reasoners to commit a contextual fallacy. At first sight, context shifting may seem rather trivial with argumentative forms such as the (HS), (AS), (CON), (FPM), (SPM), but it is obviously fallacious with argumentative forms such as (MP), and (CE). I think that the difference between the two groups is that the first suggests a violation of context in their propositional content because people assume that the context necessary to evaluate the conditional is one where the antecedent is assumed as true. This is probably motivated by the inferential form of conditional sentences, since the term 'if' apparently indicates that the antecedent is assumed as a hypothesis used in an inference directed to the

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[25] Rumfitt (2013: 183).
[26] Anderson & Belnap (1975: 17–18); Durand-Guerrier (2003).
[27] Anderson & Belnap (1975: 17–18).
[28] Jackson (1987: 26–31).

consequent. Consider again the counterexample to (AS). The conclusion 'If the match is struck and it is held under water, then it will light' is regarded as false because it is considered in a circumstance where the antecedent is assumed as true, but in this circumstance the antecedent of the premise, 'If the match is struck then it will light', is also false. The conditionals do seem to have different truth values because they are evaluated in different contexts determined by the hypothetical assumption of the truth of each antecedent. Now, compare this example with an instance of (CE): 'It's raining and the streets are wet. Therefore, the streets are wet'. There is no temptation to shift the context during the evaluation of the argument, because there is no hypothetical assumption that artificially separates the context of the premise from the context of the conclusion.

Another puzzling aspect of context shifting is that people are less tempted to shift the context when the conclusion preserves the propositional content of the premise. This is the reason why some authors refuse the validity of (FPM), but accept the validity of (SPM)[29]. One reasonable explanation for this discrepancy is that they shift the context in the First Paradox, but not in the Second, because the Second preserves the propositional content of the premise. If we consider the logical form alone, it is less counter-intuitive to infer $A \rightarrow B$ from $B$ than to infer $A \rightarrow B$ from $\neg A$, because unlike $\neg A$, $B$ is contained in the propositional form of the conditional. However, it is also counter-intuitive to infer $A \rightarrow B$ from $B$ if the contextual assumptions are illicitly changed. For instance, it is counter-intuitive to infer 'if the players broke their legs, the match will not be canceled' from 'The match will not be canceled', if we evaluate the conditional in a context where it is assumed that the players broke their legs.

The truth of the matter is that both paradoxes stand or fall together since there is no independent reason to accept one over the other. If the reason to accept the validity of (SPM) is that if it is a fact that the consequent is true, then it remains a fact even if the antecedent is true; then a similar reason will justify the (FPM), for if it is a fact that the antecedent is false, then it remains a fact even if the consequent would be false if the antecedent were true.

Another reason for this difference in treatment is that in discussions about (FPM) and (SPM), when authors think about the counterexamples to (FPM), they are usually cases where $A \rightarrow B$ can be true even if the truth of $A$ lead to the falsity of $B$, but the counterexamples to (SPM) are usually ones where $A \rightarrow B$ can be true even if the truth value of $A$ has no relevance to the truth value of $B$. Both aspects are puzzling, but one can refuse that $A \rightarrow B$ can be true when there is a negative relevance of $A$ to $B$, while accepting that $A \rightarrow B$ can be true due to the irrelevance of $A$ to $B$. One example where the truth value of the antecedent has no relevance to the truth value of the consequent is the conditional: 'if the moon is made of cheese, two plus two equals four'. This conditional will be true simply because two plus two equals four. This is appalling since a false hypothesis about the constitution of the moon has no relevance to the truths of arithmetic, but is usually perceived as a non-issue, since it is widely accepted that conditionals are true when $A$ and $B$ are true, even if they are irrelevant to each other[30]. However, this is not enough reason to justify

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[29] Edgington (1986: 25).

[30] McGlynn (2012: 276–277). There are exceptions though. Some philosophers will propose systems of logic built around the notion of relevance—see Anderson & Belnap (1975), Anderson, Belnap & Dunn (1992), Mares (1994), and Read (1988). There are also other approaches to conditionals that are more informal and metaphysical-minded, but also deem relevance as a necessary element for its truth conditions by means of a notion of conditionality—see Anjum (2008) and Sanford (2006). I will leave to another opportunity the discussion of whether $A \rightarrow B$ can be true when $A$ is irrelevant to $B$.

preferential treatment of (SPM) since the material assumption that a conditional will be true simply because its antecedent is false can also be puzzling due to the irrelevance of the antecedent to its consequent. In fact, the conditional mentioned above will also be true simply because the the moon is not made of cheese.

## 4. THEORETICAL RAMIFICATIONS

The contextualist defence can be used to extend the material account to subjunctive conditionals. After all, classical argumentative forms involving subjunctive conditionals such as (CON), (AS) and (HS) are valid if the context is held fixed[31]. All suggests that a similar defence would work with (FPM) and (SPM) involving subjunctive conditionals. For instance, (FPM) ensures that from the premise 'John will not drink poison' it is legitimate to conclude that 'If John had drunk poison, it would be good for his health'. The conclusion is only false when the antecedent is true, but the premise is only true in when the antecedent is false.

Thus, the fixed context requirement has significant consequences. It is not only necessary to preserve the validity of innocent argumentative forms, including (MP)[32] and (CE), but it also implies the material account of both indicatives and subjunctives.

These surprising theoretical ramifications, however, are not reflected in the current shape of the debate. Contextual fallacies are so common that they are either ignored, or observed in an inconsequential manner. The same Lewis[33] who believes that (HS), (CON) and (AS) involving subjunctive conditionals are conditional fallacies, accepts that they are valid with indicative conditionals. Jackson[34] agrees with him. Lowe[35] followed the inverse path, by arguing that these argumentative forms are valid for subjunctives, but invalid for indicatives. Gillies[36] and von Fintel[37] defend (HS) for subjunctives by preventing context shifts, but deny the validity of (FPM) and (SPM), which are also motivated by context shifts. The same strategy is also used by Edgington[38] in her defence of (HS) for indicatives, and McDermott[39] in his defence of (AS) for subjunctives, but they deny the validity of (FPM) and (SPM), respectively. Braine[40], Brogaard and Salerno[41] also argued that counterexamples to (HS), (CON) and (AS) involving subjunctive conditionals could be debunked as contextual fallacies, but have nothing to say about these argumentative forms with indicatives, or about the material account for that matter.

This half-hearted approach to contextual fallacies reflects the inconsistencies in the literature. The contextualist defence of argumentative forms is used almost exclusively with

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[31] Counterexamples to (CON), (AS) and (HS) with subjunctive conditionals are presented by Lewis (1973: 12–13; 31–35), which nicknamed these argumentative forms as 'conditional fallacies'. These counterexamples can be handled by the same contextualist defence used with these argumentative forms with indicative conditionals. See Brogaard & Salerno (2008), Lowe (1995), Lycan (2005), Tichy (1984), and Wright (1983).
[32] Lycan (1999: 134).
[33] Lewis (1973).
[34] Jackson (1987).
[35] Lowe (1995: 56–57).
[36] Gillies (2007).
[37] von Fintel (2001: 132).
[38] Edgington (1995: 254).
[39] McDermott (2004: 346–347).
[40] Braine (1979).
[41] Brogaard & Salerno (2008: 41).

subjunctive conditionals[42], and even then it is not used in a consistent manner in all cases, e.g., defences of (HS) for subjunctives are common, but there is no defence of (FPM) and (SPM) for subjunctives.

One could object that we should not be so hasty in extending the material account of indicatives to subjunctives, since there are examples of conditionals that suggest that indicative and subjunctive conditionals have different truth conditions. Consider the following indicative and its corresponding subjunctive pair:

(1c) If Oswald did not kill Kennedy, someone else did.
(2c) If Oswald had not killed Kennedy, someone else would have.

Intuitively, these conditionals have different truth conditions. After all, to accept (1c) is enough to know that Kennedy was killed by someone, but to accept (2c) is necessary to assume a conspiracy theory regarding his murder[43]. However, it can be argued[44] that (1c) and (2c) only seem to have different truth conditions when interpreted in different contexts. This becomes clear if we incorporate the background facts implicit in each conditional in their propositional content. If (1c) involve only the facts that Kennedy was killed by someone and that Oswald is the main suspect, then (2c) must involve the same facts. Thus, (2c) must be interpreted as (2c)* 'If Oswald wasn't the one who killed Kennedy, then someone else was'. Thus, if (1c) is interpreted as an attribution of identity, its corresponding pair is (2c)* not (2c), and their difference is removed

Besides, even if we were to admit that indicatives and subjunctives have different truth conditions, we would still need to explain why the contextualist defence of classical argumentative forms with subjunctive conditionals is not followed by a material account of subjunctives. It seems that there is no reason to ignore the material account of subjunctives than a personal preference for more accepted approaches such as possible world theories. Perhaps the motivation is to modify the possible world theories by addressing these issues. The problem is that any such fix will be unmotivated on principle, since possible world theories have a built-in context shift. This becomes clear once we consider that during the evaluation of the truth value of $A \rightarrow B$, possible world theories allow us to consider a hypothetical circumstance in which $A$ is true (e.g., the closest $A$-world) even if $A$ is false in the actual world. But we are not entitled to assume $A$'s truth in a context where $A$ is false, since this is an illicit shift of the context. Their rules also allow the use of two antecedents with different background facts on the comparative similarity measure used to evaluate conditionals[45]. If the relevant worlds to evaluate the conclusion of a (HS) are the ones in which the antecedent is true, and not the actual background facts of the context[46], then any argument for the validity of (HS), it is an argument against the possible world theories[47]. In

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[42] The exceptions are Allott & Uchida (2009a; 2009b) and Chakraborti (1998: 498–501), who to my knowledge were the only ones to provide a full contextualist defence for indicatives involving (FPM), (SPM), (AS), (HS) and (CON). Sinnott-Armstrong (1999: 129) defends (MP) and (AS) for indicatives; Blum (1986: 111) defends (AS) for indicatives, and Edgington (1995: 254), as it was already mentioned above, defends (HS) for indicatives.
[43] Lewis (1973: 3).
[44] Fogelin (1998: 288).
[45] Cross (2011: 95).
[46] Lewis (1973: 32–36).
[47] Cross (2011: 96).

effect, any argument for (AS), or (CON) it is also an argument against possible world theories.

The contextualist defence also has to block the solution that critics of the material account use to explain away the impression that certain classical argumentative forms are valid. Consider the classical argumentative form known as Or-to-If: $A \vee B \vDash \neg A \rightarrow B$. This argumentative form is innocent in the sense that it has only intuitive instances such as the following: 'Either the butler or the gardener did it. Therefore, if the butler didn't do it, the gardener did'. Stalnaker[48] argues that this argumentative form only seems valid because it is a reasonable inference, in the sense that in every context in which the premise is accepted, it is a context that entails the conclusion. But to ensure that anyone who accepted the premise would be in position accept the conclusion is not a guarantee that it is impossible that the premise is true and the conclusion is false. In other words, it would preserve reasonability, not truth.

But notice that what Stalnaker described as preservation of reasonability is nothing more than preservation of truth given the fixation of context. For all theoretical purposes, a reasonable inference it is then a valid inference. This thought did not occur to Stalnaker, because he probably assumed that uniformity of context is just a pragmatic element, when it is actually a necessary condition for the preservation of truth. Thus, the best explanation of why we are unable to find counterexamples to innocent argumentative forms such as Or-to-If is not that they are reasonable, but that they are valid. The fact that they are reasonable is just an indication that they tend to be used when the context is held fixed and therefore are naturally resistant to contextual fallacies that motivated the other counterexamples in the first place.

The contextualist defence has theoretical ramifications in other areas that also commit contextual fallacies with conditionals. Brogaard and Salerno[49] highlighted the importance of the contextualist defence in discussions about attribution of knowledge. Consider the following sceptical argument: 'I know I have hands. If I know I have hands, then I know I am not a brain in a vat. Therefore, I know I am not a brain in vat.' The argument is valid, but it is arguable that the premises are true and the conclusion is false. Contextualists[50] argue that the argument is valid if the epistemic standards assumed in the context are fixed. In a context of ordinary knowledge attributions, the epistemic standards are lower, so I do know that I am not a brain in a vat, but in contexts of sceptical attributions of ignorance the epistemic standards are higher, so I don't know I have a hand.

The contextualist argumentation is also relevant to discussions about the conditional analysis of dispositional properties. Suppose that a certain vase has the dispositional property of being fragile. This fact can be expressed in the following conditional: 'If this vase were to drop, it would break'. However, this analysis faces the accusation of being a conditional fallacy, since the vase could have its property masked in some way, e.g., if a guardian angel decided to protect it with bubble wrap should it be dropped[51]. The problem is that I'm willing to accept the conditional, but I would abandon it in the event that the antecedent turn out to be true, since the angel's interference would ensure that the consequent end up being false.

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[48] Stalnaker (1975: 270).
[49] Brogaard & Salerno (2008: 41–42).
[50] See Cohen (1987), DeRose (1995), Lewis (1996).
[51] Yablo (2016: 8).

But since the conditional can be false when the vase still possesses its property of being fragile, the conditional analysis must be mistaken.

This objection, however, incurs in an illicit change of the background facts implicit in the acceptance of the conditional. The acceptance of 'If this vase were to drop, it would break' presupposes some background facts, such as that the vase is at a distance from the floor that is sufficient to break it in the event of a fall, that the floor is not couched, etc., in other words, it involves usual circumstances that do not include angels affecting the property of the vase in a miraculous fashion.

Contextual fallacies are also used in discussions about causality. The counterfactual theory of causality asserts that two events that occurred, $C$ and $E$, that the event $E$ depends counterfactually from event $C$ if, and only if, if $C$ had not occurred, $E$ would not have occurred. This relation of counterfactual dependence is sufficient for the presence of causality[52].

One can object that causality is not transitive with counterfactual theory of causality by presenting a counterexample where $C_1$ is cause of $E_1$, and $E_1$ is a cause of $E_2$, but $C_1$ is not a cause of $E_2$. Consider the following example:

> My dog bites off my right forefinger. Next day I have occasion to detonate a bomb. I do it the only way I can, by pressing the button with my left fore finger; if the dog-bite had not occurred, I would have pressed the button with my right forefinger. The bomb duly explodes. It seems clear that my pressing the button with my left forefinger was caused by the dog-bite, and that it caused the explosion; yet the dog-bite was not a cause of the explosion[53].

This counterexample commits a contextual fallacy. This becomes clear if we consider the background facts involved in the example:

> (1d) If the dog had not bitten my right forefinger, I would have used my right hand.
> (2d) If I could have used the right hand, I would not have used the left hand.
> (3d) If I had not used my left hand, I would have not detonated the bomb.
> (4d) Therefore, if the dog had not bitten my right hand, I would have not detonated the bomb.

There is a context shift during the evolution of the argument. (3d) is accepted only if the dog bit my right hand. But, (1d), (2d) and (4d) are accepted only in contexts where the dog did not bite my right hand. The counterexample is disarmed.

## 5. POTENTIAL MISUNDERSTANDINGS

The contextualist defence should not be misunderstood with other approaches that attempt to interpret the premises of the counterexamples as elliptical to more complex propositions that contain contextual assumptions. For instance, consider the counterexample to (AS): 'If the match is struck then it will light. Therefore, if the match is struck and it is held under water,

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[52] Lewis (1973).
[53] McDermott (1995: 531).

then it will light.' This counterexample can be dealt with by arguing that the premise is actually an elliptical for 'If the match is struck and it is dry, then it will light', since the conditional was asserted having in mind a usual context (e.g., the match is dry, etc.). This implies that the conditional strengthened in the conclusion will then have a contradictory antecedent: 'If if the match is struck and it is held under water, and it is dry, it will light'. Since the antecedent is contradictory, the conditional cannot be false. The counterexample is disarmed.

One could object that this strategy cannot work for two reasons. The first is that this approach assume that semantic ellipses are common, but they are rare. The second problem is that if we accept this strategy, every time a contingent conditional is threatened by (AS) we will have to conclude that is an elliptical for a necessary conditional. It seems absurd to conclude that every contingent conditional must be elliptical for a necessary conditional because every contingent conditional has a potential defeater[54].

But while I do think that the use of ellipsis is a flawed strategy, I don't think these objections are decisive. The ellipsis strategy is used to clarify the contextual assumptions of the speaker. It is obvious that ellipses are rare, but the point is that at least conceptually we are justified in asserting that common conditionals entail the acceptance of their respective pairs strengthened by ellipses. However, this does not demonstrate the absurd consequence that every contingent conditional is necessarily true, since both the conditional and its ellipsis are false. For instance, suppose that I assert the conditional 'If I struck the match, then it will light', which has the following ellipsis: 'If I struck the match and it is dry, then it will light'. However, I did not know that this match was chemically altered to prevent it from lighting in contact with air. In this case the conditional and its ellipsis are both false.

The real problem of this strategy is that it confuses speakers' assumptions with propositional content. The speaker accepts that the match is not wet when he asserts the conditional, but this is a reason to accept the conditional, and not a propositional content of the conditional itself. This becomes clear if we consider the following mental experiment. Suppose that the distinction between contextual assumptions and propositional content were blurred and we decided to strength every conditional asserted by a speaker with her contextual assumptions. In this bizarre reality we would have to conclude that the speaker would have no contextual assumption left to assert the conditional in the first place, since they were all embodied in the asserted proposition.

Another possible misunderstanding that should be avoided is to interpret the contextualist defence as an explanation of the counterexamples focused on the defeasible character of reasoners' beliefs. Consider the counterexample to (AS). This could be explained as a case in which one could accept the premise in order to infer the conclusion, but would abandon the truth of the premise after discovering the falsity of the conclusion. This way of answering the counterexamples is naturally reinforced by the view that classical logic is monotonic regarding the validity of its argumentative forms, but non-monotonic regarding the content of its premises[55]. The validity of a deductive argumentative form is monotonic, since the addition of new premises cannot make a valid argumentative form invalid. But the content of a premise is non-monotonic in the sense that the belief in its truth can be affected by the discovery of new information. What happens is that if one would accept the premise realised later on that there is no oxygen in that particular context, then she would abandon both the

[54] Lycan (1993: 420).
[55] Thompson (1991: 250).

premise and the conclusion. The logic is non-monotonic regarding the truth of the premises. A premise that is taken as true given certain assumptions could be discarded as false if a new assumption that is incompatible with the assumptions of the premises were admitted in the conclusion.

This interpretation, however, commits a categorical mistake in attributing a property of arguments to premises. A premise is not monotonic or non-monotonic, but only true or false. To claim that the truth of a premise can be affected by new discoveries is just a less rigorous way of asserting that beliefs that we take as true given our assumptions can reveal themselves to be false in the face of new information. Besides, it is implausible because it ignores that we would infer a conclusion from a premise precisely because we believe that the assumptions of the premise are sufficient to infer the truth of the conclusion. It does not seem reasonable that one would accept the conditional 'If you strike the match, then it will light'; decided to employ it on a (AS) type of inference, but then realizes it is better to abandon it once she realizes its logical consequence. No minimally competent reasoner would act in this way. It seems more plausible to suggest that the reasoner who accepts the validity of (AS) displays one of the following behaviours: (a) she will accept the premise and the validity of the inference, and in this case she will accept the conclusion, no matter how counter-intuitive it is; (b) she doesn't accept the premise, but decides to employ it on a (AS) inference to show how implausible it is to suggest that one would accept it even after realising its logical consequence.

The explanation focused on the defeasibility of reasoners is even more implausible if we consider the reasoner as an arguer. In an argument, the arguer tries to persuade another person of the truth of the conclusion based on the truth and plausibility of the premise. After all, if the premise is not more plausible than the conclusion, the person addressed by the argument will have no reason to accept the conclusion. Thus, the idea that one would be willing to convince another person of a conclusion she doesn't believe, doesn't make any sense. This highlights how artificial the counterexample is since only a person who actually believes that the conclusion follows from the premise (e.g., if the match is special and can light when is soaked) would employ this argument. Either this, or they would knowingly employ a conditional with a false conjunct in the antecedent for whatever reason.

It is also important to notice that what we mean by context in this discussion should not be confused with linguistic notions such as 'common ground', which consists in the presumed background information shared by participants in a an attempt to communicate, and involve both the common beliefs of the participants, and their presumptive beliefs about what are common beliefs in these attempts of communication[56]. The common and presumed beliefs of participants in an attempt to communicate, e.g., speakers in a conversation, may diverge from the background facts that determine the truth value of a proposition.

Also, it is important to clarify that the contextualist approach tries to preserve the background facts, and not the contextual assumptions of the speaker. There is a difference then between the background facts that are responsible for the truth value of a proposition and the speaker's assumptions about the proposition. The background facts may ensure that the proposition is true, even though the speaker does not believe in it. That there is a difference between preservation of background facts and preservation of contextual assumptions is evidenced by examples such as the cheating wife example. Suppose I think

[56] Stalnaker (2002).

the conditional ‘If my wife is fooling me, I will never know’ is acceptable, because my wife is too smart to get caught. However, if I discover that she is fooling me, I would not infer that I would never know; rather, I would abandon the conditional. I cannot maintain the conditional after the realisation that she is fooling me, and thus it’s not possible to have the same assumptions about both premises. However, the background facts remain the same. Despite her intelligence, I eventually fond out that she was fooling me all this time. A similar explanation applies to Dutchman conditionals. I accept ‘If John’s speaking the truth, I’m a Dutchman’, I am not willing to infer that I am a Dutchman if it turns out that John was telling the truth, because the conditional was asserted under the assumption that the antecedent is false. I cannot have the same assumptions about both premises, but the background facts remain the same, despite my initial beliefs. John was telling the truth and he was not a Dutchman.

Another potential criticism is that the key notion of the contextualist defense is context, which was not defined or characterised in rigorous terms. And given the loose and informal way we are adopting this concept, there is no way of telling whether the illicit shift is not simply another prejudiced term for non-classical intuitions that are well motivated in their own right.

To avoid such concern, we can provide at least two notions of context preservation that are simple and relatively uncontroversial. The first that the context assumed in the premise(s) is preserved in the conclusion if, and only if, the distribution of truth-values of each variable is the same. The context preservation in this sense is aimed as an attempt to ensure the coherence of truth values distribution. For instance, given two variables in an argumentative form, *A* and *B*, are two variables that true in the premise(s), they should receive the same attribution of truth values in the conclusion, on pain of incoherence. This is enough to dismantle any single counter-example to classical logic without risking begging the question against its detractors.

We can also ensure context preservation with the requirement that the conclusion should be evaluated in the same world where the premises’ truth values are assessed. This restriction is self-explanatory and indirectly reinforced by our basic understanding of the classical conception of validity: we say that an argumentative form is valid if in every possible world where the premises are true, the conclusion is also true. What is implicit in this definition is that in order to ascertain whether the premises necessitate the conclusion, we need to judge if there is any possible world in which the distribution of truth values is such that the premises are true and the conclusion is false. If we are entitled to violate this restriction, and the truth value assessment of premises and conclusion are not determined in the same world, then we will have no means of ascertaining whether an argumentative form is valid because I can always consider a world where the premises are true and the conclusion is false. This should be more than enough to halt criticisms of this nature.

## 6. CONTEXT SHIFT PREVENTION

It would be wiser to have preventive approach to context shifting instead of trying to correcting it after it happens. First, we could change the the notion of deductive validity, since it has been poorly formulated in its usual definition. The traditional notion is that an argument is deductively valid if, and only if, in every possible world where the premises are true, the

conclusion is true. But we could adopt a more rigorous notion where an argument is deductively valid if, and only if, in every possible world where the premises are true and the relevant contextual assumptions for the truth of the premises are preserved in the conclusion, the conclusion is true; or, to put in simpler terms, an argument is deductively valid if, and only if, in every possible world where the premises are true and the context set is kept constant, the conclusion is true[57].

One could also make fully explicit the temporal indexers assumed in the propositions. Let's take the counterexample to (CE). 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 implies '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.

Now, the use of this approach in some cases has some limits. Consider the following counterexample: 'I will meet you tomorrow. Therefore, if I die tonight, then I will meet you tomorrow.' If 'tomorrow' refers one day after tonight, the conclusion will still seem unreasonable, but that only occurs if we envisage a circumstance where the antecedent is true, which cannot be the case in a circumstance where the consequent is true. A possible world where the antecedent is true would be different from the actual world which is assumed in the context. Thus, it could be argued that the world that is assumed in the evaluation of the argument should be also preserved constant.

There is also some context shifting suggested by the inappropriate use of verbs that do not reflect the order of background facts. The conditional 'If that butter will be heated, it will melt', implies by (CON) that 'If that butter will not melt, it will not be heated'. But this conditional formulation is misleading as it suggests an inversion of the causal sequence. The proper formulation of the conclusion should choose verbs whose temporal aspect preserves the causal sequence of the context, namely, 'If that butter did not melt, it was not heated', which is perfectly reasonable. A proper use of verbs will prevent similar forms of illicit context shifting.

## 7. CONTEXTUALIST HURDLES

One can try to resist the contextualist defence of the material account either by presenting examples of intuitively invalid arguments that cannot be explained away by appeals to context shifting, or by presenting examples of intuitively valid arguments that nevertheless shift the context. If there are intuitively invalid arguments that maintain the context fixed, then context shifting is not a necessary condition to present counterexamples against the

[57]Gauker (2005, chapter 2) adopts somewhat a similar approach by claiming that an argument is valid just in case in every context where the premises are assertible the conclusion is too. But I don't think this definition is satisfactory, since assertability is a poor substitute for truth. Propositions can be assertible, but false, and unassertible, but true.

material account, whereas if there are intuitively valid arguments that shift the context, then context shifting is not intrinsically fallacious.

Let's discuss first the attempts to present examples of intuitively invalid arguments that cannot be explained away by appeals to context shifting. Mizrahi presented the following counterexample to (HS) that is supposed to be immune to context shifting: '(1e) If I am in Boston at time *t*, then I am in a city whose name starts with the letter B at time *t*. (2e) If I am in a city whose name starts with the letter B at time *t*, then I might be in Baltimore at time *t*. (3e) Therefore, if I am in Boston at time *t*, then I might be in Baltimore at time *t*.' The premises are intuitively true, but the conclusion seems false. I cannot be in Boston and Baltimore at the same time *t*[58].

It could be argued that the argument either rests on a fallacy of equivocation or involves a contextual fallacy. Consider (2e). Unless the city whose name starts with a letter *B* in the antecedent is Baltimore, the conditional will be false. The reason is the same that lead to the rejection of the conclusion: it is not possible to be in two cities at the same time *t*. On the other hand, to make (2e) true, we must admit that the city in the antecedent is Baltimore. If we incorporate this antecedent, we will have 'If I am in the city of Baltimore, whose name starts with the letter *B* at time *t*, then I might be in Baltimore at time *t*'. The problem now is that the (HS) does not apply, since the antecedent of (2e) is not equivalent the consequent of (1e). Thus, the argument can be accused of being a fallacy of equivocation.

One possible reply is that the belief that the city mentioned in the antecedent of (2e) is Baltimore is an assumption accepted in a tacit manner. This solution, however, will turn the counterexample in a contextual fallacy. In (1e), the consequent is accepted under the assumption that the city whose name starts with *B* is Boston, but in (2e) the antecedent is accepted under the assumption that the city whose name starts with the same letter is Baltimore. Therefore, we can accept (1e) and (2e) in different contexts, but never in the same context. This throws out of the window the idea that both premises are true; an idea which is necessary to demonstrate that both premises can be true when the conclusion is false.

Walters[59] also advanced a putative counterexample to hypothetical syllogisms with subjective conditionals that is intended to be immune to a contextualist defence. The first premise of the counterexample is accepted under the assumption that it is plausible to think that, at least in deterministic contexts, a subjunctive conditional is true when the consequent is true and the antecedent does no determine the truth of the consequent. Thus, we can say that the following subjunctive is true: 'it would not rain if he did not do a rain dance, but it would not rain if he did either'. The conditional has the following form: $(A \vee \neg A) \rightarrow C$. It is also plausible to think that a subjunctive conditional with a possible antecedent and a necessary consequent is true. Thus, any subjunctive conditional with the form $B \rightarrow (A \vee \neg A)$ satisfies this requirement. Therefore, we can conclude from the two conditionals by (HS) with the form $B \rightarrow C$, for any given *B*. But since subjunctive conditionals are not generally true simply because the consequent is true, (HS) is invalid[60].

One obvious problem of this counterexample is that the rationale behind the acceptance of both premises implies the acceptance of the conclusion. The first premise, $(A \vee \neg A) \rightarrow C$, is accepted as true because *C* is true and independent of $A \vee \neg A$. The second premise, $B \rightarrow (A \vee \neg A)$, is accepted as true because $A \vee \neg A$ is necessary and *B* is possible. In both premises the

[58] Mizrahi (2013: 41–42).
[59] Walters (2014a).
[60] Walters (2014a: 96).

antecedent is irrelevant to the consequent. But then we can say that the conclusion inferred from these premises, $B \rightarrow C$, will be true simply because $C$ is true. After all, due to its inferential path, $B$ has no relevance to the truth of $C$. Thus, there is a context shift during the evaluation of the argument in the sense that the rationales used to accept both premises are abandoned in the conclusion.

Walters also advanced another counterexample to (HS) that is supposed to be immune to appeals to context: 'If I had lived on the moon, I would have drank freeze-dried tea. But if I had drank freeze-dried tea, I would not have lived on the moon. Therefore, If I had lived on the moon, I would not have lived on the moon.'[61] The first premise is a conditional assumed as true, but where the antecedent is completely irrelevant to the consequent. The second premise is true under certain circumstances. The conclusion, however, is false. Thus, (HS) must be invalid.

Notice that there seems to be no tension in asserting both premises and rejecting the conclusion within the same context, because Walters assumes that the first premise is an irrelevant conditional. But what does he mean by an irrelevant conditional? It is 'one conditional where the consequent is true, and the antecedent is irrelevant to whether or not the consequent obtains.'[62] The first premise then implies that the speaker is committed to drink freeze-dried tea, and living on the moon is irrelevant to whether or not she would have drank freeze-dried tea. But if living on the moon has no bearing on the speaker's willingness to drink freeze-dried tea, the second premise must be false, since it asserts that the speaker's willingness to drink freeze-dried tea is relevant to whether or not she would have lived on the moon.

It seems that we are onto something important, for Walters asserts that the second premise is true under certain circumstances without specifying what they are. In order for the counterexample to work, both premises need to be accepted within the same context, but there is no common context where living on the moon is irrelevant to drinking freeze-dried tea, while drinking freeze-dried tea is relevant to living on the moon. It's a contextual fallacy.

The only way to maintain the context fixed is to assume that both the premises and the conclusion are irrelevant conditionals of some sort. Since the first premise is accepted because the consequent is assumed as true, the second premise has a true antecedent. In that case, we have to posit that the consequent is true to ensure that the second premise is true, while stipulating that the first premise has a false antecedent, to ensure context consistency. The conclusion will have then a false antecedent and a true consequent, but since 'If I had lived on the moon, I would not have lived on the moon' only seem false in a context where the antecedent is true, there is no counterexample anymore.

It could be objected that the conclusion is intuitively false even if we recognise that the antecedent is false, but the only reason to think that a conditional with the form $A \rightarrow \neg A$ is false is that if $A$ were true, $\neg A$ would be false. But this is irrelevant since the counterexample already assumes that $\neg A$ is the case. This can be interpreted as a contextual fallacy during the evaluation of a single proposition. The proposition, in this case, the conclusion of the argument, is accepted in a context where the antecedent is taken as false, but the conclusion is evaluated in a different context, where the antecedent is taken as true. This can also be interpreted as an argumentative contextual shift in the sense that $\neg A$ implies $A \rightarrow \neg A$ in the

[61] Walters (2014b: 994).
[62] Walters (2014b: 990).

same contexts, but this argument is refused due to a contextual shift in the passage of the premise to the conclusion.

Sobel sequences can also be interpreted as counterexamples to (MP), but apparently cannot be explained as contextual fallacies. Consider the following sequence of conditionals that are both asserted in the same context: 'If Otto had come, it would have been a lively party; but if both Otto and Anna had come it would have been a dreary party; but if Waldo had come as well, it would have been lively; but…'[63] This sequence can also be constructed with indicatives: '*a*. If Albert comes to the party, it will be great. *b*. If Albert and Betty come to the party, it will be awful. *c*. If Albert and Betty and Carl come to the party, it will be great.'[64] The reason why these sequences can be interpreted as counterexamples to (MP) is that if all the members of the sequence are true, we can infer by (MP) a contradiction. Suppose that both Albert and Betty come to the party. The application of (MP) to *a* and *b* yields the contradictory conclusion that the party will be both great and awful, which is absurd[65]. Just like as the counterexamples involving (AS), the fact that Sobel sequences allow a contradictory conclusion can also be interpreted as an additional evidence that the antecedent of a conditional cannot be strengthened.

One way of disarming the counterexample without appealing to context is to observe that the speaker would accept that their intent is better captured by the following utterance: 'If Otto had come by himself, … ; but if Otto had come with just Anna, … '.[66] The Sobel sequence with indicatives would then be interpreted as 'If Albert comes to the party by himself, …; but if Albert come to the party just with Anna, … '. This solution prevents the inference of a contradiction, but conceals the nature of the problem, which despite statements to the contrary is a contextual fallacy.

The context is fixed in the sequence of conditionals if by 'context' we mean *the same context of assertion*, but is not fixed if by 'context' we mean the set of the background facts that can make each conditional true. Since the relevant notion of context is the second one, there is an illicit context shift. If the background facts are such that Albert comes to the party, but not Betty, I can infer from 'If Albert comes to the party, it will be great' and (MP) that the party will be great. In this context, I can't infer from 'If Albert and Betty come to the party, it will be awful' and (MP) that the party will be awful, simply because Betty does not come to the party. The sequence is not a counterexample if the context involving the background facts is fixed.

This solution appealing to the context-sensitivity of conditionals should be mandatory in this case, given that the counter-intuitive aspects of (MP) involving Sobel-sequences is predicted by the counter-intuitive aspects of (AS), since its counter-intuitive aspects originated Sobel-sequences in the first place. Consequently, any argument in defence of (MP) against the counterexamples of Sobel-sequences has a parallel argument in defence of (AS)[67].

Now, consider the following argumentative form: $(A\&B) \rightarrow C \vDash (A \rightarrow C)$ v $(B \rightarrow C)$. This argumentative form faces the following counterexample: 'If you throw both switch *S* and switch *T*, the motor will start. Therefore, either if you throw switch *S* the motor will start,

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[63] These examples are named after J. Howard Sobel, who first proposed that these pairs of conditionals are examples of situations where act-utilitarianism and rule-utilitarianism differ in their prescriptions of courses of action (Sobel, 1970). Lewis (1973: 10) also attributed his example to Sobel.

[64] Lycan (2005: 58).

[65] Lycan (2005: 58).

[66] Braine (1979: 41).

[67] Lycan (1993: 421–422; 427).

or if you throw switch *T* the motor will start.'[68] This counterexample is known as the switches paradox[69] and apparently resists the contextualist defence[70]. One solution is to argue that the counterexample rests on a confusion between $(A \rightarrow C)$ v $(B \rightarrow C)$ and $(A \text{ v } B) \rightarrow C$. This last propositional form conveys the unacceptable idea that throwing just one of the switches is sufficient to start the motor. However, this is not the conclusion of the argument. As a matter of fact, the argumentative form $(A\&B) \rightarrow C \vDash (A \text{ v } B) \rightarrow C$ is invalid in classical logic[71].

This solution, however, does not explain why $(A \rightarrow C)$ v $(B \rightarrow C)$ is confused with $(A \text{ v } B) \rightarrow C$ in the first place, and I think that the reason for this confusion is contextual fallacy after all. The puzzling aspect lies in the fact that the conclusion is a disjunction. Since a disjunction can be true when only one of its disjuncts is true, we are forced to assume that the conclusion can be true only when one of the conditionals is true, which implies that the motor will start only when one of its switches is thrown, which contradicts what is asserted in the premise. Notice, however, that if in the context assumed in the premise both switches *S* and *T* are thrown up, then both conditionals are true in the conclusion.

We still need to consider intuitively invalid arguments where the premise is irrelevant to the conclusion such as 'It will be hot tomorrow. Therefore, if Sarah lives in Queensland then it will be hot tomorrow.' and '1 + 1 = 2. Therefore, if Sarah lives in Queensland then 1 + 1 = 2.' Sara living in Queensland does not impact on the climate tomorrow or precludes 1 + 1 from being 2. Thus, it is not clear why the context relative to which we evaluate the conclusion should be the same as the context relative to which we evaluate the premise[72].

It is false that there is no need to maintain the context fixed, at least in the first argument mentioned above. Suppose that the premise on the first argument is evaluated in a context where it will be hot tomorrow, but the conclusion is evaluated in a different context where Sarah lives in Queensland, but it will not be tomorrow. In this case the premise is true and the conclusion is false. Of course, the same explanation will not hold for the second argument, since there are no contexts where 1 + 1 is not 2[73]. The same problem will occur if we consider trivially valid arguments with a contradictory premise, or a tautological conclusion. These arguments are intuitively invalid, but these contrary intuitions cannot be explained away as contextual fallacies.

This happens because these intuitions have a different source. The contextualist approach is useful to dismantle intuitions in cases where the antecedent of a conditional has a negative relevance to its consequent, or the premise of an argument has negative relevance to the conclusion. The idea that a conditional cannot be true when its antecedent is irrelevant to its consequent is a completely different animal from the assumption that an argument cannot be valid when the premise is irrelevant to the conclusion. However, this is usually perceived as a non-issue, since it is widely accepted that conditionals are true when *A* and *B* are true, even if they are irrelevant to each other[74]. The same can be said about arguments where the premise is irrelevant to the conclusion. Thus, while is true that the contextualist approach does not

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[68] Adams (1965: 167).
[69] See Armstrong (1970); Corcoran & Wood (1973); Gogol (1972); Parks (1972) and Settle (1973).
[70] Blum (1986: 111).
[71] Armstrong (1970: 425–426).
[72] Everett (2006: 5).
[73] Unless we admit the intelligibility of contexts in impossible worlds, but I will disregard this possibility in this article.
[74] See footnote 28.

work in these cases, this is a non-issue since it was never intended to be applied in these cases in the first place.

No defence of the contextualist approach would be complete without an analysis of examples that are intuitively valid despite context shifting. In the following example occurs a context-shift that is inferentially harmless: 'If my son goes to medical school, I shall be proud. Therefore, if my son goes to medical school, and observing how medicine must actually be practiced today ends up writing best-selling novels à la Michael Crichton, I shall be proud'. Thus, it could be objected that the requirement that the context must be kept fixed when evaluating an argument shouldn't be observed, since that would prevent harmless context shifts[75]. Another example of an intuitively valid argument with innocent context shift is the following case of conjunction introduction: 'If Mary had not had breakfast, she would have lunched sooner. If John had worn black shoes, he would have worn black socks. Therefore, if Mary had not had breakfast, she would have lunched sooner, and if John had worn black shoes, he would have worn black socks'. The salient background facts of each premise are different, but the argument is obviously valid[76].

I'm not convinced by these examples. The problem with this line of reasoning is that if applied consistently we would not be able to forbid any fallacies or invalid argumentative forms, since they can all be inferentially harmless in some cases. It is trivial that invalid inferences can preserve the truth in some cases, so it comes as no surprise that context shifting can be harmless in some cases. The problem is that context shifting also allows us to infer false conclusions from true premises in some cases, but it shouldn't.

This becomes a problem in the same examples above if we interpret the background facts assumed in the premise in a way that makes them inconsistent with the conclusion. In the first example we naturally assume that the father would be proud if his son would become a best selling writer, but that could be interpreted in a different way. Suppose that I would be proud if my son goes to medical school, because I believe a doctor can contribute to the welfare of mankind and save lives. In this context, the premise is true. Now, suppose that the context used to evaluate the conclusion has the added assumption that I have a prejudice against novelists, so I would feel deeply disappointed if he became a best selling writer. In this context, the conclusion is false. Thus, if the context is shifted, the argument turns out to be invalid. It is possible to have a combination where the premise is true and the conclusion is false.

The second example also has some problems. First, it does not really involve a context shift. The premises assume different background facts, because they are about different topics, but there is only context shift upon altering, in the *conclusion*, the background facts previously assumed in the *premises*. That doesn't occur in the example since the conclusion is a conjunction of the *same* background facts assumed in the premises. The context set is fixed. Second, we can interpret the example in a way where the context is shifted. Suppose the following are respectively the backgrounds facts of the first and second premise of the second example: Mary is on a special diet that requires her to have light bites every couple of hours; John has an OCD that propels him to always match his socks with his black shoes. Given these background facts, the premises are true. Now, suppose the background facts of the conclusion are slightly different: Mary has to fast the entire morning and John's OCD impels him to match black socks with his black shoes only on Sundays. If one now uses conjunction

[75] Fulda & Ortiz (2012: 329).
[76] Haze (2016: 29–30).

of introduction to draw an inference from the premises to the conclusion, the argument would be invalid. It seems, therefore, that whenever we allow the premises' background facts to shift in the conclusion, conjunction introduction, like any other argumentative form, becomes invalid.

Finally, there are also conceptual objections about the efficacy of the contextualist approach. One could object that holding the context fixed is not a resource that can be used to determine whether classic argumentative forms are valid or not, since some argumentative forms that are classical invalid seem valid because they preserve the context. Consider the following argument: 'If this is gold it is insoluble in water; so it's not true that if this is gold it is soluble in water.' The argument is intuitively valid, but it has the form $A \rightarrow \neg B \vDash \neg(A \rightarrow B)$, which is invalid in classic logic[77]. The problem is that the argument seems valid only because it preserves the context. If absence of context shifting can be used to refute classic logic, it is not an independent resource that should be used in defence of the material account.

This criticism, however, represents a simplistic diagnosis of the intuition in question. The inference of $\neg(A \rightarrow B)$ from $A \rightarrow \neg B$ is motivated by the idea that the acceptance of $A \rightarrow B$ involves the disposition to infer $B$ from the assumption of $A$, which on its turn implies that the negation of a conditional involves the disposition to infer $\neg B$ from $A$, which is then represented as $A \rightarrow \neg B$. However, this belief itself leads to contextual fallacy as it was previously argued.

Finally, one could object that the fact that holding the context fixed implies the material account should be interpreted as a reductio of the context requirement, and not a confirmation of the material account. After all, one's *Modus Ponens* is another's *Modus Tollens*. However, this position seems unmotivated, either because the main counterexamples against the material account result from contextual fallacies, or because contextual fallacies are not tolerated in other circumstances. To insist that contextual fallacies should be tolerated seems an ad hoc and desperate solution in order to deny the material account.

One could also object that the contextualist answer does not show that our contrary intuitions are misplaced more than it shows that the definition of validity as truth preservation in any context is unable to handle some counterexamples[78]. However, it seems that the only reason to think that the definition cannot be applied in these cases is the inclination to believe that they are fallacies in the first place, since there are no independent reasons to doubt the definition.

## 8. IF IT ISN'T BROKEN DON'T FIX IT

One cannot but wonder why contextual fallacies have become so widely accepted. There is an obvious explanation in the fact that it is a fallacy after all. It is in the very nature of a fallacy to appeal to the reasoner as valid, even if it is not. That is what fallacies do. They trick us until we learn why they are misleading, and how to spot and avoid them. This answer, however, it is not very enlightening, because it does not explain why a fallacy that is so central to our understanding of logic has been in use for so long, whereas less important fallacies are already classified and properly contained (e.g., affirming the consequent, denying the antecedent, etc.).

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[77] Stevenson (1970: 27–28).

[78] Iacona (2011: 5).

I think a better explanation lies in the prevalent methodological attitudes among conditional experts. Conditional theory has been dominated by a cavalier disregard for long-established logic principles that have thus far sustained our understanding of conditionals. Instead of relying on the theoretical contributions of those who have preceded us, improving what is working well with prudent and incremental changes, they let themselves be seduced by an unwarranted appetite for novelty, which stalled cognitive progress. Contextual fallacies became so common because they fit this impulsive mindset like a glove. In the wake of a radical logical revisionism driven by a search of novelty for novelty's sake, contextual fallacies facilitated the abandonment of old and tried principles that were perceived as dull, monotonous or uninteresting.

This taste for novelty in conditional logic is reinforced by philosophers' need to publish and make a mark. There is an industry of new logic systems that are taylor-made 'to fix' intuitively invalid argumentative forms 'refuted' by counterexamples. The fact that this methodological practice can obfuscate our understanding of conditionals is not taken in consideration, since philosophers have incentives to go to theoretical extremes with increasingly exotic systems of conditional logic. Inversely, being innovative while disregarding the tried and true principles makes things harder for everyone, so they tend to be ignored. This is unfortunate. We have come a long way since the advent of classical logic, which was honed and improved by a long process of trial and error that culminated in its contemporary version. It is unlikely that we will be able to make any meaningful contribution by dismissing this accumulated knowledge. If we want to see farther than our predecessors, we'd better use their giant shoulders.

## REFERENCES


Adams, E. (1965). The Logic of Conditionals. *Inquiry*, 8, 166–197.

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*, p. 1–17. http://www.ucl.ac.uk/psychlangsci/research/linguistics/publications/wpl/09papers/allott.

Anderson, A., Belnap, N. (1975). *Entailment*: The Logic of Relevance and Necessity, Vol. I, Princeton University Press.

Anderson, A., Belnap, N., Dunn, M. (1992). *Entailment*: The Logic of Relevance and Necessity, Vol. I, Princeton University Press.

Anjum, R. (2008). *Three Dogmas of 'If'*., Enhet i Mangfold, A. Leirfall & T. Sandmel (eds), Oslo: Unipub, 5–16.

Armstrong, R. (1970). The Switches Paradox, *Philosophy and Phenomenological Research*, 30(3), 421–427.

Barwise, J. (1986). Conditionals and Conditional Information. In: Traugott, et al. (eds.), *On Conditionals*, Cambridge University Press.

Blum, A. (1986). '⊃' and 'If-then'. *Logique et Analyse*, 29, 111.

Boh, I. (1993). *Epistemic Logic in the Later Middle Ages*. London, Routledge.

Braine, M. (1979). On Some Claims about “If-Then”. *Linguistics and Philosophy*, 3(1), 35–47.

Brogaard, B. Salerno, J. (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*: Journal of the Department of Philosophy-University of Poona, 25(4), 495–509.

Clark, M. (1974). Ifs and Hooks: A Rejoinder. *Analysis*, 34(3), 77-83.

Cohen, S. 1987. Knowledge, context, and social standards. *Synthese*, 73, 3–26.

Cooper, W. (1968). The Propositional Logic of Ordinary Discourse, *Inquiry*, 11, 295–320.

Corcoran, J; Wood, S. (1973). The Switches “Paradox” and the Limits of Propositional Logic. *Philosophy and Phenomenological Research*, 34(1), 102–108.

Cross, C. (2011). Comparative world similarity and what is held fixed in counterfactuals. *Analysis*, 71 (1), 91–96.

DeRose, K. 1995. Solving the skeptical problem. *The Philosophical Review*, 104, 1–52.

Durand-Guerrier, V. (2003). Which Notion of Implication Is the Right One? From Logical Considerations to a Didactic Perspective. *Educational Studies in Mathematics*, 53(1), 5–34.

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.

Everett, A. (2006). Review of Gauker’s Conditionals in context. *Notre Dame Philosophical Reviews*. URL: http://ndpr.nd.edu/news/25067-conditionals-in-context.

Farrell, J. (1975). A Note on the Truth-Table for P then Q. *Notre Dame Journal of Formal Logic*, 16 (2), 301–304.

Fitelson, B. (2008). *Another Argument for* ⊃. ms. URL: http://fitelson.org/142/hook.pdf.

Fogelin, R. (1998). David Lewis on indicative and counterfactual conditionals. *Analysis,* 58(4), 286–89.

Fulda, J., Ortiz, H. (2012). Strengthening the antecedent, concessive conditionals, conditional rhetorical questions, and the theory of conditional elements. *Journal of Pragmatics,* 44(3), 328–331.

Gauker, C. (2005). *Conditionals in Context*. Cambridge, Mass: The MIT Press.

Gillies, A. (2007). Counterfactual scorekeeping. *Linguistics and Philosophy*, 30, 329–360.

Gillon, B. (1995). Peirce’s Challenge to Material Implication as a Model of ‘If’. *Analysis*, 55(4), 280–282.

Gogol, D. (1972). On the Switches Paradox. *Philosophy and Phenomenological Research*, 32(3), 410–411.

Haze, T. (2016). Against the Brogaard-Salerno Stricture. *The Reasoner*. 10(4), 29–30.

Hunter, G. (1993). The Meaning of “If” in Conditional Propositions. *Philosophical Quarterly*, 43(172), 279–97.

Iacona, A. (2011). Counterfactual Fallacies. *Humana.Mente Journal of Philosophical Studies*, 19, 1–9.

Kaplan, D. (1989). Demonstratives. In *Themes from Kaplan*, ed. J. Almog, J. Perry and H. Wettstein, 481–563. New York: Oxford University Press.

Lewis, C, I. (1913) Interesting theorems in symbolic logic. *The Journal of Philosophy, Psychology and Scientific Methods*, 10(9), 239–242.

Lewis, D. (1973). *Counterfactuals,* Harvard University Press, Cambridge, Mass.

Lewis, D. 1996. Elusive knowledge. *Australasian Journal of Philosophy*, 74, 549–67.

Lowe, J. (1995). The truth about counterfactuals. *Philosophical Quarterly*, 45, 41–59.

Lycan, W. (1999). It's Immaterial (A Reply to Sinnott-Armstrong), *Philosophical Papers,* 28(2), 133–136.

Lycan, W. (1993). MPP, RIP. *Philosophical Perspectives*, 7, 411–428.

Lycan, W. (2005). *Real Conditionals*. Oxford: Oxford University Press.

Mares, E. (1994). Why We Need a Relevant Theory of Conditionals. *Topoi*, 13, 31–36.

McDermott, M. (1995). Redundant Causation. *The British Journal for the Philosophy of Science*, 46(4), 523–544.

McDermott, M. (2004). Critical Notice of Bennett's A Philosophical Guide to Conditionals. *Australasian Journal of Philosophy*, 82(2), 341–350.

McGlynn, A. (2012). The problem of true–true counterfactuals. *Analysis,* 72(2), 276–285.

Mellor, D. (1993). How to Believe a Conditional. *The Journal of Philosophy*, 90(5), 233–248.

Mizrahi, M. 2013. Why Hypothetical Syllogism is Invalid for Indicative Conditionals. *Thought*, 2(1), 40–43.

Newton-Smith, H. (2005). *Logic* - An introductory course. London: Routledge.

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, pp. 271–304.

Orayen, R. (1985). Entailment, Deducibilidad y Condicionales del Lenguaje Ordinario, *Revista Latinoamericana de Filosofía*, XI(3), 217–238.

Parks, R. (1972). Note on the Switches Paradox. *Philosophy and Phenomenological Research*, 32(3), 408–409.

Read, S. (1992). Conditionals Are Not Truth-Functional: An Argument from Peirce. *Analysis*, 52(1), 5–12.

Read, S. (1988). *Relevant Logic* – A Philosophical Examination of Inference, Basil Blackwell.

Rumfitt, I. (2013). Old Adams Buried, *Analytic Philosophy*, 54(2), 157–188.

Sanford, D. (2003). *If P, Then Q*: Conditionals and the Foundations of Reasoning. Routledge.

Sanford, D. (2006). Epistemic Requirements of Inference, Truth-makers for Conditionals, and Stand-offs. University of Connecticut, *Conditionals Conference*, 1–32.

Settle, T. (1973). The Switches Paradox: Which Switch?, *Philosophy and Phenomenological Research*, 33 (3), 421–428.

Sinnott-Armstrong, W. (1999). "MPP, RIP" RIP. *Philosophical Papers*, 28(2), p. 125–131.

Skyrms, B. (1978). If–Then: A Case Study in Logico-Linguistic Analysis. In: *Foundations of Logico-Linguistics*: A Unified Theory of Information, Language and Logic. Springer.

Smith, N. (1983). On Interpreting Conditionals. *Australian Journal of Linguistics*, 3, 1–24.

Smith, N; A. Smith. (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.

Snipes, F. (1977). On the Definition of Implication: Classroom Discussion and Justification. The Two-Year College Mathematics Journal, 8 (4), 247–252.

Sobel, J. (1970). Utilitarianisms: Simple and General, *Inquiry,* 13, 394–449.

Stalnaker, R. (2002). Common Ground. *Linguistics and Philosophy*, 25, 701–721.

Stalnaker, R. (1975). Indicative Conditionals. *Philosophia*, 5(3), 269–86.

Stevenson, C. (1970). If-Iculties. *Philosophy of Science*, 37(1), 27–49.

Thompson, B. (1991). Why is Conjunctive Simplification Invalid? *Notre Dame Journal of Formal Logic*, 32 (2), 248–254.

Tichy, P. 1984. Subjunctive conditionals: two parameters vs. three. *Philosophical Studies*, 45, 147–79.

von Fintel, K. (2001). Counterfactuals in a dynamic context. In M. Kenstowicz (Ed.), *Ken Hale*: A life in language (pp. 123–152). Cambridge: MIT Press.

Walters, L. (2014a). Conditionals, Modals, and Hypothetical Syllogism. *Thought*, 3, 90–97.

Walters, L. (2014b). Against Hypothetical Syllogism. *Journal of Philosophical Logic,* 43(5), 979–997.

Wright, C. (1983). Keeping track of Nozick. *Analysis*, 43, 134–140.

Yablo, S. (2016). Ifs, Ands, and Buts: An Incremental Truthmaker Semantics for Indicative Conditionals. *Analytic Philosophy*, 57(1), 175–213.