CONDITIONALS ALL THE WAY DOWN

Draft of August 27, 2020

Matheus Silva

ABSTRACT

It is usually accepted that unconditional statements are clearer and less problematic than conditional ones. This article goes against this popular belief by advancing the contrarian hypothesis that all unconditional statements can be reduced to conditional ones due to the way our assumptions support our assertions. In fact, considering the coherentist process by which most of our different beliefs mutually support themselves, the only genuine example of unconditional statements are cases of self-justified beliefs, but these examples are controversial and few and far between. The distinction between unconditional and conditional statements is similar to the distinction between assumptions and premises in that is a largely conventional idealisation that results from our attempts to limit epistemic complexity.

1. INTRODUCTION

> Some ancient Asian cosmological views are close to the idea of an infinite regression of causes, as exemplified in the following apocryphal story: A Western traveler encountering an Oriental philosopher asks him to describe the nature of the world: "It is a great ball resting on the flat back of the world turtle." "Ah yes, but what does the world turtle stand on?" "On the back of a still larger turtle." "Yes, but what does he stand on?" "A very perceptive question. But it's no use, mister; it's turtles all the way down." Carl Sagan, Gott and the Turtles (1974), in Broca's Brain: Reflections on the Romance of Science (1979)

It is usually accepted that unconditional sentences[1] are more accessible than conditional ones. Take for instance an unconditional sentence such as 'John went to the supermarket'. This sentence is true if John went to the supermarket, otherwise is false. The fact that John went to the supermarket is the truthmaker responsible for the truth of the sentence. There are some potential complications here. We can question which worldly entities can be potential truthmakers (may we should include state of affairs as well?), ask about the implications of truthmaking of tensed sentences (non-presentist theories or the threat of determinism), decide whether the primary bearers of truth-value are propositions instead of mere sentences, or even doubt whether it is worth positing truthmakers at all (maybe the truthmaking of all sentences would require bizarre entities such as negative facts). These are all pertinent questions that we will encounter in entries about the subject, but it is fair to say that none of these difficulties

[1] Or 'proposition'. I prefer 'sentence', but I will leave this terminological choice to the reader since this will not affect my argumentation.

are perceived by most philosophers as unsurmountable. In the worst-case scenario, one can make an educated bet on each issue and make peace with it.

These hurdles pale in comparison with the perplexities presented by conditional sentences. For starters, we don't have any obvious and intuitive way of addressing how conditionals represent reality or which worldly entities can make them true. If I say 'If John went to the supermarket, he bought M&Ms' what would be the actual truthmakers that can make this conditional true? It is not obvious there is such a thing as a conditional fact, or even a conditional state of affairs. To make matters worse, conditionals seem to have a dual nature. On one hand, they are used to represent reality, so they have categorical-like features; but on the other hand, they are also inferential in nature, so they can be also interpreted as arguments. So are conditionals statements or arguments? Maybe both? We have a tried and tested metaphysical vocabulary that allow us to make sense of the truth-value distinctions of categorical sentences and their connection to reality. But once we try to extend this vocabulary to conditional sentences it falls apart in spectacular fashion.

One may argue that these hurdles are due to the fact that conditionals are connectives and they are more complex by nature. But any rationale in this direction will be a non-starter, since, unlike conditionals, connectives such as disjunction and conjunction fit in our basic metaphysical toolbox in a seamlessly manner. When I say that 'John went to the supermarket and bought M&Ms', what I said is true iff it is true that 'John went to the supermarket' and it is true that 'John bought M&Ms'. No muss, no fuss. Disjunctions also pass the normalcy test with flying colours. The sentence 'John bought M&Ms or a Hershey's Bar' is true iff it is true that 'John bought M&Ms' or it is true that 'John bought a Hershey's Bar'. Notice that I made the effort to present the examples solely in natural language so that uninvited intuitions from formal practices don't get in the mix. A competent language user doesn't need to be indoctrinated in formal logic to accept these truth conditions. If conditionals seem off, it is because they are more complicated. We can't make sense of how conditionals are used to represent how things are.

It gets worse. Our intuitive judgements of probability are also distorted when they are applied to conditionals. If I attribute a high probability to a sentence, I believe in it. But what would mean to say that a conditional has a high probability? One reasonable guess is that the probability of a conditional, say, 'If John went to the supermarket, he bought M&Ms', is measured by the conditional probability of the consequent given the antecedent. This is the thesis known as the Equation[2]. This looks promising for ten minutes, but Lewis would soon show that if ever existed such a conditional, its probability would end up being the same as the probability of its mere consequent. This defies belief. The probability that John will buy M&Ms given that he went to the supermarket is not intuitively the same as the probability that he bought M&Ms[3].

So conditionals don't get along with unconditional sentences or other connectives, we have no idea if they are either arguments or statements, we don't understand how they can represent things in the world and the only tiny intuition that seemed clear is obviously incorrect. It would not be a stretch then to suggest that nobody understands conditionals, for they bamboozle our intuitions and force our prejudgments into submission. And as if that wasn't enough, it seems that all unconditional sentences are disguised conditionals.

---

[2] See Jeffrey (1964: 702–703).

[3] See Lewis (1976: 299–300).

Conditionals can be used to represent anything, from metaphysical principles and epistemic relations, to causal chains and empirical regularities. But if they can represent anything, everything is reducible to conditionals. This becomes acutely clear when we consider the nature of inferential justification and its conditional character. The conditionality of our belief systems is presented in section 2. The good news is that maybe have a way out of this chaos with a conventional approach. I argue that the sheer complexity of our belief systems is overwhelming and that force us to distinguish between unconditional and conditional sentences to make the subject more tractable. This is an idealised model that involves a deliberate simplification of highly complex phenomena. That is the topic of section 3. I conclude in section 4 with one possible explanation of the reasons that motivate the view that conditionals have a sui generis character.

2. CONDITIONALS AND REGRESS

Conditionals have enormous expressive power. They can be used to represent any belief, from statements about metaphysical truths and epistemic relations, to assertions on causal matters and empirical regularities. The statement 'This chair is breakable' can be expressed by the conditional 'If this chair were to drop, it would break'. The true mathematical statement that 'all prime number are only divisible by themselves and by 1' can be translated as 'If *n* is not divisible by itself and by 1, it is not prime'. The rules of a football championship prevent a match from being called off if it rains, so we can infer that 'Even if it rains, the next match will not be cancelled'. We believe that Oswald is the main suspect for Kennedy's murder, so it is safe to say that 'If Oswald did not kill Kennedy, someone else did'. There are many health risks associated with smoking, so I can say that 'If you don't quit smoking, you will increase your chances of developing a hearth disease'. It is safe to say that every belief can be reduced to a conditional expression.

It is clear that interrogatives, warnings, requests and other non-assertive speech acts can also be reduced to conditionals. I'm expecting Mary to call, I ask 'What shall I say?', and this is equivalent to the conditional interrogative, 'If Mary calls, what shall I say?'. John is about to embark for his first visit to São Paulo, so I warn him 'Watch out for the taxi drivers'; which amounts to a corresponding conditional warning, 'If you go to São Paulo, watch out for the taxi drivers'. You are going to the supermarket, so I ask 'Could you please pick up some M&M's?', which corresponds to the conditional requests, 'If you're going to the supermarket, could you please pick up some M&M's?'. The doctor assumes that the patient will still be alive in the morning, so she orders the nurse 'Change the dressing', and this is equivalent to a conditional command, 'If the patient is still alive in the morning, change the dressing'. Without knowing who are going to be the nominees for best picture, but expecting Parasite to be one of them, I say 'I bet you $100 it will win an Oscar'. This corresponds to conditional bet, 'If Parasite is a nominee for best picture, I bet you $100 it will win an Oscar'. The list goes on and on. Conditionals are everywhere.

This suggests that the way we usually approach argumentative forms is superficial. Let's take for instance a simple argumentative form such as a *modus ponens*[4]:

[4] I will use '→' for natural language conditionals and capital letters such as *P* and *Q* for sentential variables. I will not use quotes to highlight the use-mention distinction when there is no risk of confusion.

$$\frac{\begin{array}{l}P \rightarrow Q \\ P\end{array}}{Q}$$

But notice how simplistic this picture is. First, there is no acknowledgment of the inferential justification character of the second premise. The belief in *P* is justified by a belief in other sentence, let's say, *O*. This inferential justification is conditional in nature, for the belief in *P* is only justified if *O* is justified. This means that the unconditional sentence *P* is actually a disguised conditional $O \rightarrow P$. The belief in the conditional presented in the first premise is also justified by another sentence, let's say, *N*. So the actual sentential form of the first sentence should be $O \rightarrow (P \rightarrow Q)$. Thus, a more accurate representation of the modus ponens argument should be something as follows:

$$\frac{\begin{array}{l}O \rightarrow (P \rightarrow Q) \\ O \rightarrow P\end{array}}{Q}$$

One could reply that this representation is incorrect as follows: the assertion of a conditional does not require a commitment to the truth of the consequent, but if *P* is actually $O \rightarrow P$ in disguise, then the conditional would uniquely require a commitment to the truth value of the consequent. Indeed, with the exception of combination of truth values in which the antecedent is true and the consequent is false, the assertion of conditionals in general do not require any particular commitment to the truth values of its components. But this is still consistent with some conditionals requiring particular commitments to truth values. The most obvious example in this case is an even-if such as 'Even if it rains, the match will not be cancelled', which is asserted under the assumption that the consequent is true. If it turns out that the consequent is false, the speaker will not infer the falsity of the antecedent by modus tollens, but abandon the conditional altogether. Another example is when I assert '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 both the antecedent and the consequent are false. In this case, I assert the conditional precisely because I'm inviting my hearer to conclude that the antecedent is false by a *modus tollens* inference.

But this representation can still be considered inaccurate for different reasons. For starters, it ignores that the justification of a belief usually involves multiple sentences. The other defective bit is that that both premises share the sentence *Q*, so they should share at least one antecedent. Let's say then that the first premise is justified by sentences *L*, *M*, *N* and *O*; and that the second premise is justified by *N* and *O*. Thus we have the following argumentative form:

$$\frac{\begin{array}{l}(L\&M\&N\&O) \rightarrow (P \rightarrow Q) \\ (N\&O) \rightarrow P\end{array}}{Q}$$

We are not done. The conclusion is justified by the premises, so it should carry their load. The result of this modification is:

$$\frac{(L\&M\&N\&O) \rightarrow (P \rightarrow Q) \quad (N\&O) \rightarrow P}{(((L\&M\&N\&O) \rightarrow (P \rightarrow Q))\&((N\&O) \rightarrow P)) \rightarrow Q}$$

It is obvious that each sentence that was brought to the propositional form of the premises is also justified by additional sentences. Let's say that *L* was justified by *K*, *M* by *J*, and *N* by *I*. Then we will have the following improvement of the argumentative form:

$$\frac{((I\&J\&K) \rightarrow (L\&M\&N\&O)) \rightarrow (P \rightarrow Q) \quad ((J\&K) \rightarrow (N\&O)) \rightarrow P}{((I\&J\&K) \rightarrow (L\&M\&N\&O)) \rightarrow (P \rightarrow Q))\&((J\&K) \rightarrow (N\&O)) \rightarrow P) \rightarrow Q}$$

Since even the inferential rules based on what we deem valid argumentative forms are also conditional in nature, in order to accept the validity of a *modus ponens* argument you need to accept the corresponding conditional containing the premises and the conclusion[5]. So the argumentative form can be reconstructed as the following conditional:

$$(((I\&J\&K) \rightarrow (L\&M\&N\&O)) \rightarrow (P \rightarrow Q))\&(((J\&K) \rightarrow (N\&O)) \rightarrow P) \rightarrow (((I\&J\&K) \rightarrow (L\&M\&N\&O)) \rightarrow (P \rightarrow Q))\&((J\&K) \rightarrow (N\&O)) \rightarrow P) \rightarrow Q)$$

This is too cumbersome, so let's simplify this structure a little bit by applying importation to each premise. Thus we will have:

$$(((I\&J\&K\&L\&M\&N\&O)) \rightarrow (P \rightarrow Q))\&(((J\&K\&N\&O)) \rightarrow P) \rightarrow (((I\&J\&K\&L\&M\&N\&O)) \rightarrow (P \rightarrow Q))\&((J\&K\&N\&O)) \rightarrow P) \rightarrow Q)$$

If we remove the repeated assumptions, we will have:

$$(((I\&J\&K\&L\&M\&N\&O)) \rightarrow (P \rightarrow Q))\&P) \rightarrow Q$$

If we use importation one more time, we get:

$$((I\&J\&K\&L\&M\&N\&O\&P) \rightarrow Q)\&P) \rightarrow Q$$

It is not a consolation that the resulting conditional is leaner than the previous two because in order to make sense of inferential justification we will have to go on adding more and more sentences which would result in an increasingly larger conditional. The deeper we go in the justification process, the higher the level of complexity will be[6]. In this revised picture, all our unconditional sentences containing our beliefs will be packed in an unimaginably long conjunction in the antecedent of conditional—you can simply reapply importation when a new inferential dependence is added and a new conjunct will be added to the antecedent. If they happen to be asserted, other complex sentences such as conjunctions and disjunctions

[5] See Carroll (1895).

[6] It could be argued that the use of variable formulas could diminish the complexity a bit. The reason why this is not good enough is that it would defeat the purpose of the whole enterprise since it would hide the logical form of individual sentences. The idea is that we need to represent arguments more accurately, not less.

will be under the scope of this conditional as well. There are no argumentative forms anymore since they will be all reduced to a single conditional[7]. Now, suppose we pressed the proponent of this belief system with questions about the justification for this conditional. She would feel compelled to provide additional justification that would represent a fresh new antecedent of another conditional. As a matter of fact, since we update and review our belief systems on a daily basis with the introduction or removal of beliefs, this conditional would change and grow constantly and reveal the systemic character of a belief system. It's conditionals all the way down.

This radical reconstruction can be supported by an independent argument that relies on the nature of argumentation. When an argument is made, an arguer claims that the truth of the premises necessitates or makes it probable the truth of the conclusion. So it is obvious that her reasons to accept the premises and the conclusion should be involved in the evaluation of the argument. Thus, the question of whether a given argument is valid or strong will also depend on whether the reasons that support the premises in conjunction with the premises necessitate or make the conclusion probable. Consequently, a more accurate representation of argumentative forms will be more complex and require considerably more analysis of the arguers' reasons. Now, the arguer's reasons to accept the premises will involve some sort of inferential justification, so unconditional sentences will turn out to be conditionals and conditionals will be under the scope of other conditionals, and so on and so forth.

It is important to observe that some simplifications were adopted in the description above to make things more intuitive even though they are not entirely accurate. One obvious idealisation is that we took for granted that the assumptions that lead to the acceptance of the first conditional premise are the same that support the second premise. It is expected that some of them will be common since the first premise would require some understanding of what made *P* true in the first place, but that is not a given. If it were a given, we would have to say that the second premise is already contained in the first one. That this is not a given becomes clear when we consider that the arguer could defend the falsity of the consequent if she believed in the falsity of the antecedent. This means that the conditionals that correspond to our inferential justification can also assume the character of a *modus tollens* if they involve the refusal of certain assumptions, especially in reductios. The descriptions connecting the web of inferential justification associated with other argumentative forms such as hypothetical syllogism and disjunctive syllogism would be entirely different. Never mind the fact that some of the conditionals in the justification chain would involve a commitment to a stronger strict implication. What is undeniable is that whatever is the inferential process they will ultimately be reducible to a single conditional, notwithstanding its enormous complexity.

The impact of this revision on conditional theory is devastating. For starters, the vast amounts of information that would be necessary to evaluate a single conditional would turn it into a computational challenge. The fact alone that some of our beliefs mutually support themselves would mean that many conditionals would need to be reinterpreted as biconditionals. The resulting argumentative form would become so cumbersome using our current logical notation that different conventions would be required. For example, it would be necessary to use a detailed network graph to represent a simple argument. The way we

---

[7] One alternative way to maintain the distinction is to include the separate assertion of the extra antecedent. Thus, instead of $N \rightarrow (P \rightarrow Q)$ we would have $N \,\&\, (N \rightarrow (P \rightarrow Q))$. This would turn the main conditionals in conjunctions, but this would imply that argumentative forms such as *modus tollens* and contraposition will have inconsistent sentences.

would draw such graph will also reflect our beliefs about epistemic justification. For instance, coherentists, foundationalists and infinitists will present completely different representations of the same '*modus ponens* argument' and their graphs will be different for each arguer—see figure 1.

Fig. 1. The use of a Gephi graph for illustrative purposes. There is an expansion of complexity when we abandon our philosophical toys.

But let's ignore these multiple difficulties for the sake of argumentation and consider some hypotheses in conditional theory. Let's also assume that we would have enough patience and sufficient information to test how the different conditional theories would fare when they are applied to such a monstrous conditional from an external perspective. Take for instance the notion that the acceptance of a conditional is measured by the conditional probability of its consequent given its antecedent. The current probability formalism is inadequate to fit in the revised picture we offer. For can we explain the conditional acceptance of a conditional given another conditional given the previous acceptance of multiple conditionals? You cannot measure the probability of an event given the occurrence of another event in chain of conditional assumptions. This would require a serious revision in probability calculus if the nature of conditionals were to be taken seriously. How about according to conditional-assertion theories? They claim that conditional is an assertion of the consequent given the antecedent. These theories will probably fail because they refuse conditional embedding and it is not obvious that we can reduce all conditionals by importation. Possible world theories would also drown in the complexity of the phenomena because it is not obvious which world is the closest one where the antecedent is true. The fact that the conditional also contains another conditional in the antecedent would make the task of world selection even more demanding. Possible world theories seem accessible when they are applied to banal conditionals, but are very obscure with more problematic conditionals. The material account will maintain that the conditional is true when it is not the case that the antecedent is true and the consequent is false. One obvious problem is that one sentence in the antecedent will probably be false, thus making the whole conditional vacuously true. There are also some considerations about possible transformations of the conditional into different expressions, e.g., if the belief system conditional is material we can say that it is equivalent to a

disjunction $\neg((I\&J\&K\&L\&M\&N\&O\&P) \rightarrow Q)\&P) \vee Q$ or the negation of a conjunction $\neg((I\&J\&K\&L\&M\&N\&O\&P) \rightarrow Q)\&P)\&\neg Q$. But that's all assuming that the simplifications we made in the conditional above faithfully represent a belief system in its entirety. The fact alone that I relied on importation to achieve that result can be criticised, since it is a controversial inferential rule. As I mentioned before, the whole picture would be something far more complicated, so the jury is still out on conditional theory.

One could object that the only thing my argumentation shows is that there is a one-to-one correspondence between each conditional and unconditional sentence. So there is no real reduction going on, for conditional sentences can be 'reduced' to unconditional ones just as well. But this criticism misses the target because once we understand the nature of unconditional sentences properly, the only distinction is between bigger and smaller conditionals. Somewhere along the inferential line we call it quits and cut the ties with the background assumptions, but this happens with both premises of a typical *modus ponens*. The only difference is that with the constructions that are traditionally certified as conditionals the cut is made only after one assumption was introduced in the assertion content, whereas with unconditional premises all background assumptions are left out. The fact still remains that both statements are made conditionally on some background assumptions that were ruled out of the picture. The content that is explicitly expressed is only the tip of a vast iceberg of assumptions that are tied together and embody our belief systems—see figure 2.

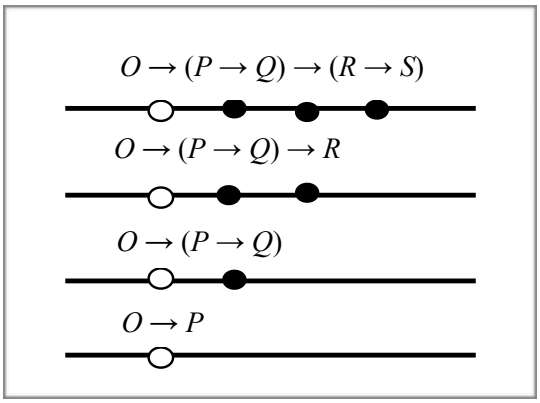

Fig. 2. The white nodes represent the conditionality that is beneath the assertion surface, and the black ones the conditionality on the assertion surface.

The reason why simple facts such as these are ignored is that we were indoctrinated by logic textbooks and other unwritten conventions about logic. We are oblivious to the most obvious things due to thoughtless repetition and prevalent practices. When such facts are mentioned at all in the literature, they are overlooked as 'unstated premises', 'background assumptions' and '*ceteris paribus* conditions'. Consequently, these subjects are either viewed as mere curiosities or thrown in 'the garbage can' of pragmatics. But while this dogmatic approach has no epistemic merits, it surely has pragmatic ones. We should avoid, and not embrace, a more accurate representation of argumentation, since it would require such a relentless level of complexity that would cripple our understanding of the world. As I argued above, not only the evaluation of a simple argument would amount to a detailed analysis of a belief system and the division between logic and epistemology would blur. Worse, considering the coherentist process by which most of our different beliefs mutually support themselves, the

only genuine example of unconditional statements would be cases of self-justified beliefs, but these examples are controversial and few and far between to make the distinction meaningful.

The impeding doom could be detailed in alternative ways. The first immediate unwanted consequence is that all conditionals would become useless without unconditional sentences. Conditionals are only inferential tickets that allow us to extract one unconditional sentence from another, but without unconditional sentences in the first place, there is no content to extract in the first place. Instead, we would have endless chains of conditional sentences floating in belief systems and bound to each other. If there were an omniscient being in possession of a complete description of each arguer's belief system, she would see each and every argument of an individual as connected, but would not be able to make any inference about any subject whatsoever. To use quantum mechanics talk, it is as if all our assertions and theoretical commitments were entangled conditionals. Worse, we would have no reasons whatsoever to accept one premise over another. The reason is simple: when an arguer accepts a premise she proposes, she does so because there are reasons to think the premise is true. But if the reasons to accept the premise will now become part of the content of premise, and the reasons that motivated these reasons will also be represented in the premise, there will be no reasons left to support the premise in the first place. Thus, even if we managed the impossible task of representing in a faithful manner all the background beliefs in the premises, this would mean that every premise would be arbitrary, which would mean that every argument would be arbitrary. But the more serious looming threat is that conditionals themselves would become meaningless, since they only make sense with unconditional sentences. To add insult to injury, since both unconditional statements and arguments are disguised conditionals, they would also become meaningless as a consequence. The last nail on the coffin is that our belief systems would be compromised and become meaningless as a result.

To sum up, acknowledging the real extension of the conditionality phenomenon would imply that (1) logic should become a sub-discipline of epistemology; (2) the current logic notation must be abandoned, and the evaluation of each argumentative form should require years of study and individual analysis of the arguer's assumptions; (3) our belief systems would be circular and every argument would be arbitrary; (4) conditionals themselves would be meaningless, which imply that categorical statements, arguments and even belief systems would become meaningless as a result. It would be a catastrophe.

2. THE WISDOM OF CONVENTIONALISM

So perhaps sticking to our baby logic notions wouldn't be such a bad idea, after all. One way to justify the status quo on the subject is argue that the distinction between unconditional and conditional sentences is a conventional matter that arises out of our necessity to control chaos and divide belief systems in manageable chunks. The distinction will vary from person to person according to the circumstances and interests. I can legislate by convention that a given premise is P because I'm not interested in a more complete logical form, whereas another person might be interested in one its assumptions in a different context, and thus will fixate by convention that it is a disguised conditional such as $O \rightarrow P$. Both options are equally correct and the choice between them will depend on what we find more convenient to use in the context.

So the abrupt cut of our belief systems into ‘unconditional sentences’ and ‘conditional sentences’ is an epistemic fiction we create for our purposes, not a factual question. This distinction has a naturalness that reflects our inferential customs. We conform, and should conform, to such a convention because it makes our lives easier by allowing us to exchange information, share beliefs and dispute ideas. Like all conventions, it is a natural and collective reaction to a demand and it is guided by pragmatic reasons. Our cognitive resources are limited, so demarcations are needed. In a sense, not only *modus ponens* arguments, but other valid argumentative forms are conventional to the degree they are cut-outs of larger structures. Whether the truth of the premises is preserved in a given argumentative form is not a conventional matter, but the fact that those premises are presented in that manner is a matter of free choice. This is more evident in logic since it involves a technical formal language openly customised to analyse natural language. The conventions are acquired either in an explicit manner in the form of books, as in a tacit fashion by imitation of the peers.

It is a framework we choose for philosophical practice. That we decide to rely on simplified fictions in logic textbooks and articles is a conventional stipulation that is motivated by pragmatic considerations such as simplicity. This is in agreement with known conventional habits in our understanding of logic. There is something to be said about the different communities and their related practices. There are different schools in they may vary in the importance they attribute to formalism in the evaluation of arguments, which variable letters are used or even the role of natural language. To take one of many examples, conditional logics are approached in completely different ways by linguists, philosophers of language, cognitive psychologists and logicians (which may also adhere to their importance they give to formalism). The disagreements about these practices may lead to unfair criticism, group thinking, bibliographical seclusion and misuse of theoretical resources. This is expected. The violation of conventions and unwritten rules is commonly received with sanctions or negative reactions that are intended to work as mechanisms of conformity. But even such vastly different communities will still adhere to some basic concepts, including the aforementioned distinction between unconditional and conditional sentences.

Of course, that does not mean that every pragmatic decision is worth it. There is an infinite number of valid argumentative forms in any given logic systems, but we focus all our attentions in a handful of them such as *modus ponens*, hypothetical syllogism, etc. Some systems that are proposed as alternatives to classical logic are attempts to fix just one or two argumentative forms, such as the paradoxes of material implication. This beam counter thinking is superficial because argumentative forms are intertwined by an immense logical web. So removing the validity of one argumentative form in a system leads to unintended revisions in other parts of the system. There are infinitely many valid argumentative forms, but we can count on our fingers the number of argumentative forms that attracts all our attention and supports our main intuitions. The immense complexity and systemic nature of the subject is in sharp contrast with our provincial thinking and piecemeal analysis. The cognitive limitations of human beings are exacerbated by the realities of theoretical practice. We need to restrict our focus, so there is a tendency to think in over-restricted manner that may be detrimental to our understanding of the subject. The unwritten rules might help, but they can also create prejudices and keep us in little bubbles that can’t scratch the surface of the subject. If we coordinate our efforts in superficial thinking, the result is merely fictional.

A similar example of inadequate convention is the arbitrary distinction between arguer's assumptions and premises. Undergrads will meet this distinction in logic textbooks and wonder how the arguer's assumptions can be left out. If they ever express this worry, they will be informed that this is a simple mistake, since assumptions are not premises. This dogmatic reaction is understandable since there are no good answers on the subject, to be honest. So the 'everybody does like this, so it is right way' instinctive remark end up having the last word because it is our interests that decide what is a premise and what is an assumption, just as pragmatic conventions decide what is a conditional or not. But while is understandable that we have to stop our analysis somewhere, since the arguer's assumptions are simply too many and intertwined to be analysed in a more precise manner, something is still amiss here. For a deductive argument is nothing more than an arguer's claim to validity. So it is obvious that her reasons to accept both the premises and the conclusion should be involved in the evaluation. Then the question of whether the premises of a given argument necessitate the conclusion or not will also depend on whether the reasons that support the premises together with the premises necessitate the conclusion or not. Consequently, a more accurate representation of argumentative forms will be needed, even if some arbitrary epistemic cut-out is made somewhere after the first layer of assumptions. The assumption/ assertion and unconditional/conditional distinctions are correlated since the evidential relation between assumptions and assertions takes a conditional form—see figure 3.

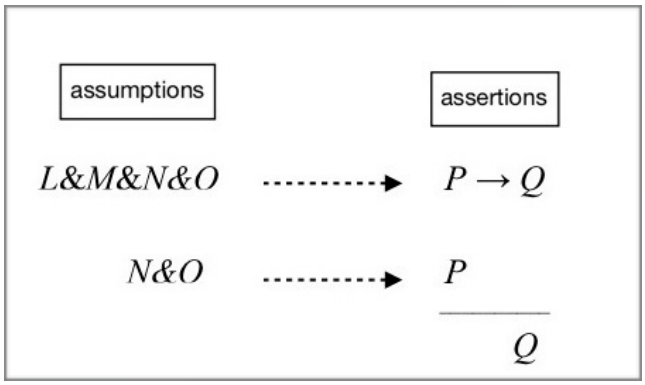

Fig. 3. The assumptions are left out of the logical analysis. This is a common practice.

If some conventions are inadequate[8], it is because the arbitrariness of a convention is restricted by non-social facts. The distinction between unconditional and conditional sentences, and the reliance on textbook cases as paradigmatic examples of argumentative forms is good because it provides a clear and simpler way to understand basic inferences and validity. But there is some reason to this choice too. So it is not as if we could just invent new systems and create adherence to it by imposition and some followers. One can design a car with a steering wheel that is controlled by foot, but nobody will want this car. The convention needs to provide a meaningful advantage over current practices or it will never get any traction. Conventions are designed to satisfy practical human needs and solve coordination problems. So deviant conventions need to satisfy them too and represent an improvement over the accepted practices.

[8] It is important to observe that my argumentation is solely focused on theoretical conventions designed to solve problems. Conventions such as games and other non-cognitive problems are not the focus of this article.

The conventional character of the distinction between unconditional and conditional sentences is also reminiscent of the causes/conditions distinction. The cause of a phenomenon is usually associated with a change in the background facts that was sufficient for something to occur, whereas a condition is perceived as the elements that are present in the background facts that are necessary for something to occur[9]. Suppose that there is a wildfire in the woods that is reported as being caused by the fall of a lighted cigarette. But the cigarette was just as necessary for the occurrence of the fire as the presence of oxygen, which we arbitrarily decide to ignore as condition. This is motivated by a multitude of reasons, including the moral accountability of the person who dropped the cigarette. Another way in each the cause/ effect and unconditional/conditional distinctions are similar involves what causality experts usually refer as causal fields. The look for a specific cause is a causal question that is posed about a particular causal field[10]. This field might be about a wildfire, a traffic accident or a homicide. Causal considerations that are not relevant for our concerns are promptly disregarded. Now making a choice to consider only certain aspects of the situation as causally significant is no different from making surgical cuttings in belief systems for conceptual analysis. In both cases we are knowingly making distinctions that are arbitrary from a general point of view that takes in consideration all the facts, but that are perfectly acceptable in that situation due to our human limitations and concerns—see figure 4.

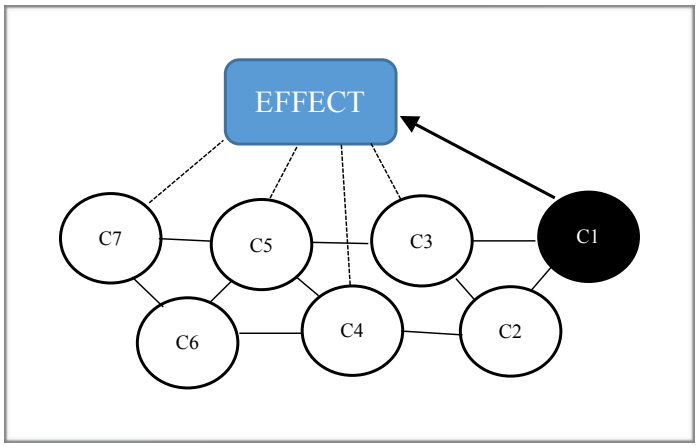

Fig. 4. Conventions at work. C1 is taken as the only cause of the phenomenon. C2-C7 are ruled out as conditions.

Particular convention practices are almost always part of larger conventional institutions. Theoretical conventions and behaviour standards are cogs in the academic machine, which as a cognitive oriented activity is a collective endeavour by default. Idealisations that are ingeniously designed to exclude extensive segments of reality in order to increase precision and focus is in its DNA. The convention is arbitrary within reason, for it is supposed to be beneficial for the collective goal. So conformity ensues and any rare occasion of deviation is punished. There is an obvious tension in resting a convention on a practical reason, when the activity the convention serves is cognitive-oriented. The expectation is that the justification for a cognitive endeavour should be solely epistemic and not pragmatic. But knowledge is only a realistic pursuit when it recognises and operates within the intrinsic limitations of the epistemic agent. It would be nonsensical to impose epistemic demands that only omniscient

[9] See Ducasse (1969: 19).
[10] See Mackie (1974: 35).

gods can satisfy if we have in mind a human practice. It is not about being complacent about ignorance.

There are no independent and pre-existing divisions between conditional and unconditional sentences. This division is a convenience, and it helps us sharing ideas and exchanging information. The typical structure of argumentative forms presented in logic textbooks are just as convention as the choice of logical symbols. The convention between conditionals and unconditionals is implicit and spontaneous. It is not implemented by a particular decision in any given moment in time. It needs to be this way under the penalty of circularity, for in order to apply the distinction between conditionals and unconditionals we already have to make a distinction between them. The rules and examples we see in textbook are codifications of practices that always occurred in natural language. They result of an epistemological need to make sense of arguments when the real structure of argumentation is too complex for a compelling analysis.

The description of the conventional and social aspect of our baby logic conventions assumes the importance of idealised models. These models occur when there is an intentional attempt to simplify or distort highly complex phenomena in order to make them more accessible and easier to grasp[11]. The distinction between conditional and unconditional sentences is a deliberate simplification or distortion of belief systems in order to cope with their immense complexity. The already mentioned distinction between background conditions and causes are also idealised models. We can also add to the list physics models involving frictionless planes, economy models that work under assumptions that agents are omniscient and fully rational and biology models that study isolated populations.

It is possible that the conditionals/unconditionals distinction can be even described as a toy model. A toy model represents an extreme simplification and distortion of the research subject by focusing on a very restrict number of explanatory factors[12]. There are some examples of toy models that can also be described as caricatures, since they focus on a few salient properties of a system and distort them into extreme cases[13]. This description fits our explanation like a glove. The distinction between conditionals and unconditionals is caricature that focus on epistemic cuts, thereby disregarding all other factors that could negatively impact on our understanding of logical consequence including the background assumptions of the speaker and the inferential nature of belief justification. This will allow us to ‘get a feeling’ of what a valid argumentative form looks like, get used to logic conventions, etc.

There is a non-negligible risk though that due to conceptual habits we might end up taking up the model for the reality. It is one thing to use an extreme simplification to get used to logical notions and possibly develop a theory of logical consequence. It is entirely another to take for granted that this extreme simplification will fit in real-life argumentation. This becomes clear with other toys, such as the basic argumentative forms that students learn in logic courses. Argumentative forms such as modus ponens and hypothetical syllogism are nowhere to be seen in real-life sophisticated deductive practices. The notion that our

[11] See Potochnik (2017).
[12] See Hartmann (1995).
[13] See Gibbard and Varian (1978).

simplifications accurately match reality because they work in idealised conditions should be taken with a grain of salt.

4. CONDITIONAL SENTENCES SHOULDN'T BE WEIRD

We tend to view conditionals as fundamentally weirder and more inaccessible than unconditional ones, but given that conditional and unconditional sentences are ultimately equivalent, our main intuitions on the subject are fundamentally wrong. This demands some explanation. One educated guess is that the blame lies on the prevalent view that conditionals can be interpreted as functions. This is bound to cloud our views on the subject, since we are moved away from the use of conditional sentences in natural language, which will only reinforce their artificial character. Conditionals are intuitive and natural when they are interpreted alongside unconditional sentences and their inferential justification, but they look strange and inaccessible when they are interpreted as artificial functions. This doesn't imply that conditional logics that rely on such functions are incorrect, but it might shed some light on why there are some uneasiness associated with the distinct hypothesis about the nature conditionals. Whether there is some important piece of the puzzle hidden underneath this aspect of conditional theories remains to be seen.

REFERENCES

Carroll, L. 1895. What the Tortoise Said to Achilles? *Mind* 4, 278–80.

Ducasse, C. J., 1926. On the Nature and Observability of the Causal Relation. *Journal of Philosophy*, 23: 57–68.

Gibbard, A., Hal. V. 1978. Economic Models, *The Journal of Philosophy*, 75(11): 664–677.

Hartmann, S. 1995. *Models as a Tool for Theory Construction: Some Strategies of Preliminary Physics*, in Herfel, William, Wladiysław Krajewski, Ilkka Niiniluoto, and Ryszard Wojcicki (eds.), Theories and Models in Scientific Process (Poznań Studies in the Philosophy of Science and the Humanities 44), Amsterdam: Rodopi: 49–67.

Jeffrey, R. 1964. If (Abstract). *Journal of Philosophy*, 61, 702–703.

Lewis, D. 1976. Probabilities of Conditionals and Conditional Probabilities. *Philosophical Review*, 85(3), 297–315.

Mackie, J. L. 1974. *The Cement of the Universe*. Oxford: Oxford University Press.

Potochnik, A. 2017. *Idealization and the Aims of Science*, Chicago, IL: University of Chicago Press.