

WHAT THE ADOPTION PROBLEM DOES NOT SHOW

Lo que el Problema de la Adopción no muestra

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Abstract

Saul Kripke proposed a skeptical challenge that Romina Padró defended and popularized by the name of the Adoption Problem. The challenge is that, given a certain definition of *adoption*, there are some logical principles that cannot be adopted—paradigmatic cases being Universal Instantiation and Modus Ponens. Kripke has used the Adoption Problem to argue that there is an important sense in which logic is not revisable. In this essay, I defend two independent claims. First, that the Adoption Problem does not entail that logic is never revisable in the sense that Kripke addresses. Second, that, to assess whether an agent can revise their logic in the sense that Kripke addresses, it is best to consider a different definition of adoption, according to which Universal Instantiation and Modus Ponens are sometimes adoptable.

Key words: Adoption Problem; Anti-exceptionalism about Logic; Revisability of Logic; *Logica utens*.

Resumen

Saul Kripke propuso un desafío escéptico que Romina Padró popularizó bajo el nombre de Problema de la Adopción. El desafío consiste en que, dada una cierta definición de adopción, hay algunos principios lógicos que no pueden ser adoptados, siendo Instanciación Universal y Modus Ponens los casos paradigmáticos. Kripke ha utilizado el Problema de la Adopción para argumentar que hay un sentido importante en que la lógica no es revisable. En este ensayo, defendiendo dos afirmaciones independientes. La primera es que el Problema de la Adopción no entraña que la lógica nunca sea revisable en el sentido que Kripke aborda. La segunda es que, para evaluar si un agente puede revisar su lógica en el sentido que Kripke aborda, lo mejor es considerar una definición de adopción diferente, de acuerdo con la cual Instanciación Universal y Modus Ponens son a veces adoptables.

Palabras clave: Problema de la Adopción; Anti-excepcionalismo lógico; *Logica utens*; Revisabilidad de la Lógica.

1. Introduction

A logical theory—a logic for short—is a theory about logical consequence, viz. what follows deductively from what. There are several different logics. Since the mid-twentieth century, it has become popular to think that we can pick one among the available logics and use it as a canon for our reasoning; in particular, it is thought that we can *change* the way we reason as a result of having picked one logic or other. The idea comes in different flavors. Carnap, for example (1937), argues that logical principles are conventions and, thus, they are necessarily true and known a priori. Quine (1951) and Putnam (1969), on the other hand, claim that logical principles are on a par with statements from any other area of science—physics, biology, etc.—and so they receive empirical confirmation and are known a posteriori. Despite the differences, there is the common underlying idea that we can *choose* at our will—based on whatever selection criteria we deem appropriate—what set of logical principles we shall use to reason. I will call this kind of voluntaristic claim the *revisability of logic thesis*.

Saul Kripke (1974, 2021) proposed a skeptical challenge that Romina Padró (2015, 2021) studied and popularized by the name of the Adoption Problem. The challenge assumes a specific definition of adoption, which is roughly as follows: an agent *adopts* a logical principle just in case (a) they accept a principle with which they have no prior practical experience, and (b) they start *following* the principle, that is to say, using it to guide their inferences. The challenge is that, given this definition, some logical principles cannot be adopted. Paradigmatic cases are Universal Instantiation and Modus Ponens, which I will respectively spell out thus:^{1,2}

¹ I choose a quantified formulation, as opposed to a schematic one. Nothing in this essay hinges on this choice.

² Notice that, in MP, the quantification is not explicitly restricted to statements (viz. the rule says, “For all x and $y...$ ”, and not “For any *statements* x and $y...$ ”). In all the rules throughout the paper I will assume that the restriction is implicit, and agents *can* and *do* read the variables as only having statements in their range. I make this assumption only for simplicity, but none of my theses hinges on it. (If we wanted to explicitly restrict all rules to statements, then we could use a conditional (“For any x , if x is a statement, then...”) or an entailment claim (“For any x , the fact that x is a statement entails...”). Given these formulations, an agent could obtain the relevant consequences applying MP and VD, respectively. Since I do not argue that MP and VD are both adoptable or even weakly adoptable (see Sect. 4) at the same time, I am free to assume that all agents in all my mental experiments manage at least one of these two rules.

(UI) If you accept a universal statement, accept each of its instances

(MP) For any x and y , if you accept x and “if x then y ”, accept y

However, Kripke argued that other witnesses of the problem seem to be the Law of Non-Contradiction and Adjunction:

(LNC) A statement and its negation cannot both be true

(ADJ) For any x and y , if you accept x and you accept y , accept “ x and y ”

The reason why each of these principles cannot be adopted is, in few words, that an agent can start following the principle only if they are *already* able to perform inferences conforming to it—but if they are already able to perform inferences conforming to it, then they have prior experience with the principle and, according to definition we gave, they cannot adopt it.

Kripke has appealed to the Adoption Problem to argue that there is an important sense in which the revisability of logic thesis is false. Suppose that by a ‘revision of logic’ we mean that an agent accepts a bunch of logical principles construed as premises,³ and then changes the way they reason by just drawing their consequences. In this sense—Kripke claims—a revision of logic is not possible. In this essay I defend two independent claims. First, that the Adoption Problem does not entail that logic is not revisable in the sense that Kripke addresses. Second, that, to assess whether an agent can revise their logic in the sense that Kripke addresses, it is best to assume an alternative notion of adoption, according to which Universal Instantiation and Modus Ponens *are* sometimes adoptable. I consider that my conclusions are compatible with some of the main philosophical consequences attributed to the Adoption Problem; however, I hope that my critical discussion will shed some light upon the scope of the skeptical challenge.

The plan of the essay is as follows. In Sect. 2, I give a quick guide through the Adoption Problem as it is presented by Kripke and Padró. In Sect. 3, I defend the first claim of this essay. In Sect. 4, I turn to the second claim. Lastly, in Sect. 5, I present my conclusions.

³ More precisely, Kripke talks of ‘hypotheses’, ‘beliefs’ or ‘statements’ that one can either accept or reject. I chose the word ‘premises’ to encompass the three options. As will be made clear later, the idea that Kripke wants to criticize is that logical principles are just ‘further elements’ of our overall system of scientific commitments.

Before going on, a comment is in place. The logical principles that we deal with in this essay are not (and are not meant to be) reasonable as they stand. For example, as already noted by Padró (2015, p. 57), what we labelled UI is not a quite plausible principle, for it demands from the agent a myriad of inferences (more precisely, one inference for each instance of every universal statement that they accept), and many of these inferences may be irrelevant. As a matter of fact, there is a whole literature on how exactly logical principles should be formulated—if they are to regulate our reasoning at all (see Harman 1986; Field 2009; MacFarlane 2004; Steinberger 2020). Drawing on Steinberger (pp. 30–31), we could perhaps formulate Universal Instantiation as, e.g.,

(UI*) If you have reasons to consider whether an instance of a universal statement obtains, you should either accept the instance or reject the universal statement.

Clearly, this demands fewer irrelevant inferences than UI, and so is more plausible. For the purposes of this essay, however, I follow Kripke and Padró and stick to the simplest (though less attractive) formulations of logical principles. Our arguments and conclusions for these formulations will—hopefully—extend to the more sophisticated ones.

2. The Adoption Problem

To give some background, I first introduce the philosophical views that the Adoption Problem is primarily meant to undermine. Then, I explain in some detail how the Adoption Problem works. Lastly, I summarize its main putative philosophical consequences.

2.1. *The targets*

Kripke and Padró deploy the Adoption Problem against different—albeit not unrelated—philosophical views.

Kripke's main target is Quine's (1951) view known as *anti-exceptionalism about logic*. The core of the view is that there is no sharp epistemological cleavage between laws of logic and claims from any other area of science; laws of logic are just 'further statements' in our scientific picture of the world, and thus they are—as any other scientific statement—susceptible of being revised for empirico-pragmatic reasons. In Quine's words:

[T]otal science is like a field of force whose boundary conditions are experience [...] the logical laws being in turn simply certain further statements of the system, certain further elements of the field. [...] Any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system. [...] Conversely, by the same token, no statement is immune to revision. Revision even of the logical law of the excluded middle has been proposed as a means of simplifying quantum mechanics.

Putnam (1969) famously endorsed an antiexceptionalist attitude towards logic and argued that, in the face of results in quantum mechanics, we should replace classical logic by a system where the law of distributivity fails. Recently, broadly anti-exceptionalist positions were endorsed among others by Maddy (2002), Priest (2014, 2016), Russell (2014, 2015) and Williamson (2013, 2015)—however, these more recent proposals may differ in relevant aspects with Quine’s view, so they are not necessarily vulnerable to the Adoption Problem.⁴

Padró’s main target is what Boghossian (2014) calls the *intentional rule-following* account of inference. The view is a conjunction of two claims: (a) to make an inference is to follow (or act guided by) some general rule—this is the ‘rule-following’ aspect of the doctrine; (b) to follow (or act guided by) a rule is to proceed in accordance with (or conforming to) the rule in virtue (or on the basis) of having either explicitly or implicitly accepted or grasped its content—this is the ‘intentional’ aspect. Padró and Boghossian independently argue that, if an agent is to follow a rule in the sense required by this view, the agent has to recognize that the triggering conditions of the rule are met, and then, from this fact and their prior grasp of the rule, draw the conclusion that they ought to behave in a certain way. If this is correct—and I assume it is—then, for the intentional rule-following account of inference, making an inference involves following a rule, and, in turn, following a rule involves making another inference with the rule among the premises. Padró argues that something along the lines of this view underlies various of the most well-known approaches to the justification of logical principles (e.g. BonJour’s (1998) rationalism, Carnap’s (1937) conventionalism, Quine’s (1951) antiexceptionalism, and Boghossian’s (2000) meaning-constitutive account); hence, a critique of the view is—

⁴ As pointed out in fn. 3, according to Kripke, the Adoption Problem is likely to remain troublesome as long as logical principles are treated as hypothesis, beliefs, or statements that one can accept or reject.

according to Padró—of remarkable philosophical relevance. Hereafter, whenever I talk about rule-following, I refer to the notion as it is understood by the intentional rule-following account of inference.

Next, we turn to how the Adoption Problem works, and why it is supposed to undermine the abovementioned philosophical views.

2.2. *The challenge*

A succinct formulation of the skeptical challenge can be found in Padró (2015, p. 41):

ADOPTION PROBLEM: certain basic logical principles cannot be adopted because, if a subject already infers in accordance with them, no adoption is needed, and if the subject does not infer in accordance with them, no adoption is possible.

To understand the relevance of this claim, we need to make precise at least two notions: *adoption* and *accordance*. Padró provides a characterization of adoption which is meant to fit Kripke's usage of the notion (see Padró 2015, pp. 31, 42; 2021, p. 4). I take it that the following definition is faithful to Padró's characterization:

ADOPTION (Kripke and Padró): An agent adopts a logical principle at a time t if and only if

- (a) They did not infer in accordance with the principle at any time before t
- (b) They accept the principle at t
- (c) They start to infer in accordance with the principle after t
- (d) They do (c) in virtue of (b)

Condition (a) captures the requirement that the agent has no prior practical experience with the principle to be adopted. Conditions (c) and (d) equate the assumption that the agent starts *following* the relevant principle. We follow Padró and Boghossian and assume that an agent behaves *in virtue* of having accepted a certain principle—viz. condition (d) is met—if and only if the agent makes an inference with the principle in question among the premises.⁵

⁵ While Padró does not endorse this assumption in general, she assumes it holds at least for the purposes of assessing the intentional rule-following account of inference in the context of the Adoption Problem.

The notion of acting in accordance with (or conforming to) a principle is more complex than it appears at first glance. For now, I restrict my attention to UI and MP, and assume that an agent infers in accordance with some of these principles at a time t just in case, at that time, the agent makes an inference, and this inference is *required* by the corresponding principle.⁶ (I will come back to this notion in Sect. 3.)

With the above definitions and clarifications in place, I now explain how the Adoption Problem works for its two main witnesses: UI and MP. Let Harry be any subject. Consider UI first. (Assume that Harry is a reliable user of MP.)

- Suppose that Harry made an inference in accordance with UI at some time before t . Then, he cannot adopt the principle at t [by condition (a)].
- Suppose that Harry has never made an inference in accordance with UI. Imagine he accepts the principle, and he also accepts the premise “All ravens are black”. To follow UI and infer “This raven is black”, he has to reason:
 1. If you accept a universal statement, accept each of its instances [premise]
 2. If you accept “All ravens are black” and it is a universal statement, accept each of its instances [UI on 1]
 3. You accept “All ravens are black” and it is a universal statement [premise]
 4. Accept each instance of “All ravens are black” [MP on 2,3]
 5. If “This raven is black” is an instance of “All ravens are black”, accept it [UI on 4]
 6. “This raven is black” is an instance of “All ravens are black” [premise]
 7. Accept “This raven is black” [MP on 5,6]

But by assumption, Harry does not infer in accordance with UI, so he never passes from 1 to 2 or from 4 to 5. Hence, he does not adopt the principle at [by condition (c)].

At this point, an apparent objection arises. The fact that Harry accepts UI at t could, in principle, trigger some causal chain such that

⁶ I also assume that a principle *requires* a certain action from an agent just in case the requirement of doing this action follows, by some plausible imperative or deontic logic, from the principle and the (description of the) relevant facts. So, for example, if an agent accepts “All cats are cute”, UI requires that she accepts “This cat is cute”. (I thank an anonymous reviewer for asking me to clarify this point.)

Harry ends up making the inferential moves from 1 to 2 and from 4 to 5 in the above reasoning. In that case, Harry would eventually infer “This raven is black” from “All ravens are black”.

The objection, however, is not successful. Condition (d) in ADOPTION requires that at least the first inferences in accordance with UI that Harry makes after t are made *following* the principle. If some arbitrary causal chain pushed Harry to make the moves from 1 to 2 and from 4 to 5, these moves would be made in accordance with but not following UI; thus, condition (d) would remain unsatisfied, and Harry would not have adopted the principle.

It is noteworthy that, in this reconstruction of the Adoption Problem, we grant Harry a good deal of syntactic knowledge: he can use as a premise that “This raven is black” is an instance of “All ravens are black”. Thus, Harry’s failure to adopt UI is not plausibly explained by his inability to see some syntactic facts, as for example that certain statements are universal or that certain statements are instances of certain other.⁷

Now, consider the case of MP. (Assume that Harry is a reliable user of UI.)

- Suppose that Harry made an inference in accordance with MP at some time before t . Then, he cannot adopt the principle at t [by condition (a)].
- Suppose that Harry has never made an inference in accordance with MP. Imagine he accepts the principle, and he also accepts the premises “If it is night, then it is dark” and “It is night”. To follow MP and infer “It is dark”, he has to reason:
 1. For any x and y , if you accept x and “if x then y ”, accept y [premise].
 2. If you accept “If it is night, then it is dark” and “It is night”, accept “It is dark” [by UI on 1].
 3. You accept “If it is night, then it is dark” and “It is night” [premise].
 4. Accept “It is dark” [by MP on 3].

But by assumption, Harry does not infer in accordance with MP, so he never passes from 3 to 4. Hence, he does not adopt the principle at t [by condition (c)].

⁷ While I think that Kripke would agree on this, maybe Padró would not, for she writes: “The difficulty is that to be able to recognize it [“All the animals in the movie *Madagascar* talk”] as a particular universal statement he [Harry] has to perform a universal instantiation, something that, by hypothesis, he doesn’t do” (2020, p. 34). In any case, I consider that my presentation of the Adoption Problem makes a strong case for the claim that syntactic knowledge plays no major role in the argument.

Again, if some arbitrary causal chain pushed Harry to make the move from 3 to 4, then this move would be made in accordance with but not following MP; condition (d) would remain unsatisfied, and Harry would not adopt the principle.

To finish this section, I next present some of the main philosophical morals that have been drawn from the Adoption Problem.

2.3. Putative philosophical consequences

For clarity, it will be useful to help ourselves with the distinction between *logica utens* and *logica docens*. The distinction is well-known in the epistemology of logic (e.g. Padró 2015, p. 45; Priest 2014). I broadly follow Cohnitz and Nicolai's (2021) formulation. We call *logica docens* the logic we teach; it can be understood as an explicit theory of logical consequence, and it can but needs not be formulated in a formal language. We call *logica utens* the logic that we use under suitably idealized circumstances (that exclude mistakes by limits in time, cognitive capacities, etc.); it can be understood as the set rules that we recognize as normatively governing our reasoning.

The Adoption Problem has been used by Kripke and Padró to argue for at least the following four morals:

- (1) *Logic is special*. The basic principles of our *logica utens* are not just 'further statements' that we choose to endorse and from which we draw consequences. Any kind of logical anti-exceptionalism according to which our scientific worldview is exclusively composed from such statements is wrong.
- (2) *Logic is not something we adopted*. Our actual *logica utens* is not just the result of having accepted certain principles as premises and drawn their consequences.
- (3) *We cannot adopt a logic*. We cannot revise our *logica utens*, viz. our informal reasoning, by just accepting logical principles as premises and then drawing their consequences.
- (4) *The intentional rule-following account of inference is wrong*. Basic rules of inference do not guide our inferential practice. If they did guide, an agent like Harry could be helped by our explicitly providing them with the rules.

The first three claims are defended by Kripke; the last is defended by Padró. I do not argue that the four claims are independent of one another. Moreover, I do not maintain that, according to Kripke, the first three claims all *follow* from the Adoption Problem. However, it is certain that Kripke defends these claims, and he does so appealing to

the Adoption Problem; for this reason, I consider it interesting enough to analyze whether the claims follow or not from the skeptical challenge.

In what follows, I take for granted that the Adoption Problem entails the first, second and fourth claims (viz. that logic is special, that we did not adopt our logic, and that the intentional rule following account of inference is wrong) and I argue that it does not entail the third one (viz. that we cannot adopt a logic in Kripke's sense).

3. Revisability

In this section I claim that the Adoption Problem is compatible with the thesis that we can adopt a logic in Kripke's sense, viz. we can revise the way we reason by just accepting some logical principles as premises and then drawing their consequences.

First, I provide some further analysis of the notion of *accordance*. In Sect. 2.2, I defined this notion for the cases of UI and MP. What would a general definition look like? An intuitive idea would be as follows: an agent infers in accordance with a logical principle P at a time t just in case, at that time, the agent makes an inference, and this inference is required (or recommended) by P . However, I argue that this definition does not work. Kripke and Padró consider at least two different kinds of logical principles. On the one hand, principles like for example

(UI) If you accept a universal statement, accept each of its instances

(MP) For any x and y , if you accept x and "if x then y ", accept y

On the other hand, principles like

(UI[≡]) Every universal statement entails each of its instances

(MP[≡]) For any x and y , x and "if x then y " entail y

The principles of the first kind I will call *normative*. They talk about what we ought (or have reasons) to infer from what.⁸ The principles of the second kind I will call *descriptive*. They talk about what follows from what, that is, the relation of entailment that we usually formalize using the semantic \models or syntactic \vdash turnstile. The reason why the above

⁸ Normative logical principles, in my sense, are akin to so-called *bridge principles* (see MacFarlane 2004).

definition of accordance does not work is, in a nutshell, that descriptive logical principles lack any normative content, so they never require (or recommend) any particular behavior. Thus, according to the definition, an agent could never behave in accordance with a descriptive principle, and, as a consequence, a descriptive principle could never be adopted by anyone. But—I take it—this is not how the Adoption Problem is supposed to work: we do not want the descriptive logical principles to be unadoptable for the sole reason of being descriptive. Thus, I propose the following different definition:

- ACCORDANCE: an agent infers in accordance with a logical principle P at a time t just in case
- (i) if P is normative, the agent makes an inference at t and this inference is required or recommended by P ; and
 - (ii) if P is descriptive, then at t the agent infers in accordance with some principle that constitutes a plausible normative counterpart of P .⁹

Hence, an agent infers in accordance with MP^F just in case they infer in accordance with something along the lines of MP . The definition is vague of course, but I think good enough to keep our discussion on the Adoption Problem going.

Now, we are ready to tackle revisability. Let Carrie be any agent. Suppose that Carrie infers (mostly) in accordance with UI and MP . (She does not follow these principles; she has just the practice of conforming to them.) However, Carrie has never inferred in accordance with the principle of Addition. We show her a truth table and convince her to accept:

(\vee -in) For any x and y , if you accept x accept “ x or y ”

Now, we ask her what her name is, and she answers “Carrie”. Next, we ask whether it is the case that her name is Carrie or $0=1$. She reasons:

1. For any x and y , if you accept x accept “ x or y ” [premise]
2. If you accept “My name is Carrie”, accept “My name is Carrie or $0 = 1$ ” [by UI on 1]
3. You accept “My name is Carrie” [premise]
4. Accept “My name is Carrie or $0 = 1$ ” [by MP on 2,3]

Carrie started inferring in accordance with \vee -in, and she did so by

⁹ What I said in fn. 6 about requirements extends, *mutatis mutandis*, to recommendations.

making an inference with the principle among the premises. So, we can say that she started following *V*-in. Thus, we have a first example where an agent adopts a logical principle according to the definition assumed by Kripke and Padró. I give two more examples.

Suppose, now, that Carrie is nine years old and has Logic at her primary school. She already handles UI and MP but has made no inference in accordance with the principle of Explosion. The teacher tells her:

(Exp) For any x and y , if you accept x and “not x ”, accept y

Besides, the teacher asks Carrie to accept—just for a while—the thesis that the president of Argentina is both good and not good. Then, she reasons:

1. For any x and y , if you accept x and “not x ”, accept y [premise]
2. If you accept “The president is good” and “The president is not good”, accept “ $0 = 1$ ” [by UI on 1]
3. You accept “The president is good” and “The president is not good” [premise]
4. Accept “ $0 = 1$ ” [MP on 2,3]

Carrie started inferring in accordance with Exp, and she did so by making an inference with the principle among the premises. So, we can say that she started following Exp, and conclude that she adopted the principle. Lastly, she needs to learn the puzzling *verum sequitur ad quodlibet*. The teacher indicates:

(VSAD) For any x and y , if you accept x accept “if y then x ”

Then, Carrie reasons:

1. For any x and y , if you accept x accept “if y then x ” [premise]
2. If you accept “My name is Carrie” accept “if $0 = 1$, then my name is Carrie” [UI on 1]
3. You accept “My name is Carrie” [premise]
4. Accept “if $0 = 1$, then my name is Carrie” [MP on 2,3]

Again, Carrie started inferring in accordance with VSAD, and she did so by making an inference with the principle among the premises. So, we can say that she started following VSAD, and conclude that she adopted the principle.

In the three cases considered so far, Carrie adopted a logical principle (in Kripke and Padró’s sense) and thus we can say that she revised her *logica utens* (in the sense of revision that Kripke addresses).

That is to say, she accepted a logical principle as a hypothesis and then drawn its consequences.

A remark is in place here. According to Kripke, another way of stating the main moral of the Adoption Problem is that we cannot revise our reasoning in a way that contravenes our intuitions. This would contrast with other sciences such as geometry, since our intuitions about, say, the physical world can, if faced with recalcitrant evidence, be regarded as erroneous and discarded. Kripke writes,

The point is that logic, even if one tries to throw intuitions to the wind, cannot be just like geometry because one cannot adopt the logical laws as hypotheses and draw the consequences. [...] [Y]ou can't undermine intuitive reasoning in the case of logic [...]. One can only reason as we always did, independently of any special set of rules called 'logic', in setting up a formal system or in doing anything else. (2021, pp. 19, 20)

Now, I deny that the Adoption Problem entails such a moral. The denial, of course, comes parallel to the main claim of this section, namely, that the Adoption Problem does not entail that we cannot “adopt logical laws as hypothesis and draw the consequences”. Notice that in our hypothetical cases, we do not need to assume that Carrie *changes* her intuitions to any extent. We can imagine that she still has the intuition that EXP and VSAD are invalid, and yet she accepts these principles based on the authority of her teacher, follows them, and make the appropriate inferences.

It is worth remarking that we are not assuming a behavioralist conception of the nature of inference. *Given* that Carrie accepts, say, VSAD and the claim “My name is Carrie” as premises, she infers the claim “If, then my name is Carrie”. The inference is intuitive for her, so we can assume that she takes the premises to be *reasons* to accept the conclusion. It is in this sense that she inferred “If, then my name is Carrie” *in virtue* of having accepted VSAD, and her revision of logic was a rational process. She is not just ‘blindly’ reproducing VSAD-patterns.¹⁰

¹⁰ An anonymous reviewer complains that Carrie does not understand *why* VSAD is valid, and this would undermine my claim that her revision was rational. But I do not find such an objection compelling. First, if the objection was right, we could say, by analogy, that I cannot rationally infer any trivial consequence of Gödel's Incompleteness Theorem unless and until I fully understand its proof, but this does not seem to be the case. Intuitively, we can rationally update our beliefs on the base of premises who-

So far, we focused on situations where an agent adopts a new logical principle. Throughout the history, however, most proposals for a revision of logic sought the abandonment of certain logical principles deemed as problematic. So, what would abandonment of principles look like? I think that Kripke and Padró could accept the following notion:

ABANDONMENT: An agent abandons a logical principle at a time t just in case

- (a) They do not violate the principle before t
- (b) They accept a statement incompatible with the principle at t .
- (c) They start violating the principle after t , whenever possible.
- (e) They do (c) in virtue of (b)

Where we say that an agent *violates* a normative logical principle at a time t just in case they do not make an inference that the principle requires at that time; the agent violates a descriptive logical principle just in case they violate some plausible normative counterpart of it.

Can the above definition of abandonment be met in any hypothetical case? I give two examples for a positive answer. First, suppose that Carrie infers (mostly) in accordance with the following converse of Validity Detachment:

(VD \leftarrow) Infer ψ from $\varphi_1, \dots, \varphi_n$ by logic alone only if $\varphi_1, \dots, \varphi_n$ entail ψ

At this point, Carrie is a fairly good student. Her worst mistake is that she is convinced that the schema “it is not the case that if φ then not- φ ” is a logical law, and so she infers each instance of the schema from \emptyset , viz. the empty set. The teacher says:

($\overline{\text{ARIST}}\models$) For any x , \emptyset does not entail “it is not the case that if x then not x ”

Then, she reasons:

1. For any x , \emptyset does not entail “it is not the case that if x then not x ” [premise]
2. \emptyset does not entail “it is not the case that if $0 = 1$ then $0 \neq 1$ ” [UI on 1]

se justification we do not fully grasp. Second, it may well happen that Carrie understands why VSAD is valid, and yet she feels that it is invalid (or that there is something odd going on); intuitions need not match justified beliefs.

3. Do not infer, by logic alone, “it is not the case that if $0 = 1$ then $0 \neq 1$ ” from \emptyset [VD \leftarrow on 2]

Carrie accepted $\overline{\text{ARIST}}^{\text{F}}$, which is a statement incompatible with the principle “it is not the case that if φ then not- φ ”. Besides, she started violating the latter principle, and she did so by making inferences with $\overline{\text{ARIST}}^{\text{F}}$ among the premises. So, we can say that, according to our definition, she abandoned the principle “it is not the case that if φ then not φ ”.

To finish, imagine that Carrie has grown up and she has now started taking philosophy classes. The teacher, who is a physics enthusiast, tells her:

($\overline{\text{DISTR}}^{\text{F}}$) For any x, y, z , “(x or y) and z” does not entail “(x and z) or (y and z)”

Then, she reasons:

1. For any x, y, z , “(x or y) and z” does not entail “(x and z) or (y and z)” [premise]
2. “(2 is even or 2 is odd) and 2 is prime” does not entail “(2 is even and prime) or (2 is odd and prime)” [by UI on 1]
3. Do not infer, by logic alone, “(2 is even and prime) or (2 is odd and prime)” from “(2 is even or odd) and 2 is prime” [by VD \leftarrow on 2]

She feels puzzled about this stuff, but luckily manages to pass the philosophy exam. Carrie accepted $\overline{\text{DISTR}}^{\text{F}}$, which is incompatible with the distributivity principle she had used before taking philosophy. Besides, she started violating this latter principle, and she did so by making inferences with $\overline{\text{DISTR}}^{\text{F}}$ among the premises. So, we can again conclude that she abandoned a principle, this time distributivity.

Notice that we did not focus on extravagant or complex inferential patterns, but rather on well-known principles either intuitively or classically valid. The main moral I would like to draw is the following: the Adoption Problem is compatible with an important class of hypothetical cases where *logica utens* can be revised by just accepting logical principles as premises and drawing their consequences. Moreover, in the cases considered nothing precludes theoretical considerations from trumping the intuitions of the relevant agent; in other words, the agent needs not change her intuitions to revise her *logica utens*. Notice that what I said so far is compatible with the ideas that

- *Logic is special*: we did not assume that UI and MP are just ‘further statements in the system’ of Carrie’s beliefs.

- *Logic is not something we adopted*: we did not assume that Carrie had learned UI or MP by adoption in some distant past.
- *Basic rules of inference do not guide our practice*: we did not assume that Carrie follows UI or MP, in any interesting sense.

So, that is all as regards the first claim I defend in this essay. In the next section, I argue that, to assess whether an agent can revise their *logica utens* in the sense that Kripke addresses, it is best to consider an alternative definition of adoption.

4. Weak Adoption

Cohnitz and Nicolai (2021) claim that, if an agent already conforms to some form of Modus Ponens and certain restricted variant of Universal Instantiation, then the agent can adopt any other logical principle whatsoever. Is that claim correct? Well, certainly not under the definition of adoption assumed by Kripke and Padró.

Consider Barry. He conforms to MP and the principle that we shall call ‘Metalinguistic Universal Instantiation’:

(MUI) If you accept a universal statement about statements, accept each of its instances

Thus, Barry confidently makes inferences such as “All contradictions are false. Therefore, if “This pencil is red and not red” is a contradiction, it is false”. However, whenever he accepts a universal statement about non-linguistic entities (viz. a statement such as “All ravens are black”), he behaves as a Pyrrhonian instantiator: he suspends judgement about the instances. Now, imagine we convince Barry to accept UI. Then, he can reason:

1. If you accept a universal statement, accept each of its instances [premise]
2. If you accept “All ravens are black” and it is a universal statement, accept each of its instances [MUI on 1]
3. You accept “All ravens are black” and it is a universal statement [premise]
4. Accept each instance of “All ravens are black” [MP on 2,3]
5. If “This raven is black” is an instance of “All ravens are black”, accept it [MUI on 4]
6. “This raven is black” is an instance of “All ravens are black” [premise]
7. Accept “This raven is black” [MP on 5,6]

Principle MUI licenses the inference from 1 to 2 because premise 1 is a universal statement about statements (it ascribes a property to all universal statements), and 2 is one of its instances; likewise, MUI licenses the inference from 4 to 5 because premise 4 is a universal statement about statements (it ascribes a property to all instances of “All ravens are black”), and 5 is one of its instances. Since by assumption Barry performs MUI, he can complete the above reasoning.

One may feel tempted to conclude that Barry adopts UI in the situation depicted. But Kripke and Padró’s definition of adoption requires that, at the time the agent accepts the principle to be adopted, they have never made an inference in accordance with the principle in question—in other words, they have no prior experience with it. When Barry accepts UI, he has already made inferences in accordance with MUI. Besides, every inference in accordance with is also an inference in accordance with UI. Hence, Barry does not adopt UI under Kripke and Padró’s definition. So, *pace* Cohnitz and Nicolai, it is not the case that, if an agent conforms to some form of Modus Ponens and certain restricted variant of Universal Instantiation, they can adopt any other principle, in Kripke and Padró’s sense of adoption.¹¹

Now, is not Kripke and Padró’s definition of adoption too demanding? I claim that the answer depends on what it is exactly what we want to investigate. On the one hand, we could want to analyze whether the acceptance of a logical principle can *found* certain inferential practice—and this is what Padró (2015) seems to focus on. In this case, the definition seems adequate: it would not make sense to say that the acceptance of a principle founds a practice if the practice was already there to begin with. On the other hand, we could want to analyze whether an agent can revise her *logica utens*—viz. change the way they reason—by just accepting a logical principle as a premise and drawing its consequences. In this case, the definition seems too demanding indeed. The whole point of trying to revise our *logica utens* is, arguably, to make some useful or fertile change in our inferential practices. Indeed, when Kripke presents the Adoption Problem applied to the case of UI, the author complains:

If we understand it [UI] as a hypothesis or belief that we ‘adopt’ in order to (indirectly) determine its empirical impact, we should

¹¹ Cohnitz and Nicolai use a schematic restricted variant of UI, which they call scs. However, the difference between scs and MUI is not relevant for my argument; the reason is that, since scs is a restricted variant of UI, every inference in accordance with scs is also an inference in accordance with UI.

conclude that its scientific fertility is *zero*. It will not lead to a single prediction. (2021, p. 16)

So, we can assume that, if an agent accepts some logical principle, draws its consequences, and the process is fertile, then the agent has revised their *logica utens*.¹² Moreover, the change made by Barry in the example strikes us as quite fertile—after all, he started instantiating universal statements about non-linguistic entities! Then, Barry’s change of behavior should count as a revision of *logica utens*. The key point I want to make is that, sometimes, it is useful to accept and start drawing consequences from a principle, even if our conformity to it is partially grounded in antecedent practice.

For this reason, I claim that, to assess whether an agent can revise her *logica utens* in the sense that Kripke addresses, we should appeal to the following alternative notion of adoption:

WEAK ADOPTION. An agent weakly adopts a logical principle at a time *t* if and only if

- (a*) They violate the principle several times before *t*, and they do so in a systematic way.
- (b) They accept the principle at *t*
- (c) They start to infer in accordance with the principle after *t*
- (d) They do (c) in virtue of (b)

By a ‘systematic way’ we mean that the agent’s violating the principle is not just a byproduct of mistakes or limits in computational capacity. Notice that the chief difference between WEAK ADOPTION and Kripke and Padró’s ADOPTION lies in the first condition: (a*) requires that the agent violates the principle to be adopted *many* times, but not necessarily *always* before the adoption.

Next, I argue that Universal Instantiation and Modus Ponens are sometimes weakly adoptable. The fact that Barry weakly adopts UI in the example above should be quite clear. Before accepting UI, he systematically violates the principle for statements about non-linguistic entities. Afterwards, he conforms to the principle and, moreover, he

¹² The horns of the Adoption Problem (see Sect. 2) provide examples where the process turns out to be infertile. In the first horn, the agent accepts a principle to which they were already conforming before. In the second horn, the agent accepts a principle from which they can draw no relevant consequences. (Notice that, from UI, maybe (we do not know) Harry can draw some irrelevant conclusions such as “UI or 0=1”.)

does so because he takes it as a premise in his reasoning.

Hence, let us move on to Modus Ponens. Suppose, now, that Barry conforms to UI and Validity Detachment:

(VD) If $\varphi_1, \dots, \varphi_n$ entail ψ and you accept $\varphi_1, \dots, \varphi_n$, then accept ψ

So, he confidently makes inferences as “Sentence ‘This is red’ entails ‘This is red or pink’. You accept ‘This is red’. Therefore, accept ‘This is red or pink’”. Regarding material conditionals, however, Barry always behaved as a Pyrrhonian eliminator: whenever he accepted the premises of a Modus Ponens, he suspended judgement about the conclusion. Now, imagine Barry accepts MP^F. Thus, he can reason:

1. For any x and y , x and “if x then y ” entail y [premise]
2. “It is night” and “If it is night, it is dark” entail “It is dark” [UI on 1]
3. You accept “It is night” [premise]
4. You accept “If it is night, it is dark” [premise]
5. Accept “It is dark” [VD on 2,3,4]

The fact that Barry weakly adopts MP^F should be quite clear again. Before accepting the principle, he systematically violates it. Afterwards, he conforms to the principle and, moreover, he does so because he takes it as a premise in his reasoning.

One could wonder whether, in this scenario, Barry also adopts MP^F under Kripke and Padró’s definition. I do not commit to a definite answer. On the one hand, one could argue that Modus Ponens and Validity Detachment codify so similar inferential practices that having experience with one of these principles should count as having experience with the other.¹³ If this route is taken, then, obviously, Barry does not adopt MP^F in the situation depicted. On the other hand, however, one could insist that Modus Ponens and Validity Detachment are different principles: one governs the locution “if..., then...”, the other the locution “... entails...”; besides, these locutions have different modal strength; for these reasons, having experience with one of the principles should not count as having experience with the other. If this route is taken, then Barry can be said to adopt MP^F. At any case, the choice is not essential for what I am arguing here, for my whole point is that Barry at least *weakly* adopts MP^F.

¹³ Accordingly, inferring in accordance with one of them should count as inferring in accordance with other. This could demand some further adjustments in our notion of accordance.

Do we need an abandonment counterpart for our weak definition of adoption? I think yes, and the reason is that, many times, when we find a problematic principle, we might want to abandon *some* instances of the principle, but not all of them. But the definition of abandonment in Sect. 3 does not allow for such a move. Hence, I propose the following:

WEAK ABANDONMENT. An agent weakly abandons a logical principle at a time t just in case

- (a) They do not violate the principle before t .
- (b) They accept a statement incompatible with the principle at t .
- (c*) They violate the principle several times after t , and do so in a systematic way.
- (d) They do (c*) in virtue of (b).

Notice that the chief difference between WEAK ABANDONMENT and ABANDONMENT lies in the third condition: (c*) requires that the agent violates the principle to be abandoned *many* times, but no *every* time after the abandonment.

Next, I argue that Universal Instantiation and Modus Ponens can sometimes be weakly abandoned. Consider Universal Instantiation first. Suppose Barry conforms to MUI and MP. Besides, he sometimes follows UI (after all, he weakly adopted this principle in the past!).¹⁴ One day, he finds the following inference

Everything is material. Ergo, Casper the friendly ghost is material

After asking some experts, he concludes that the premise is true, but the conclusion is not so (cf. Nolt 2018). He stops accepting UI and embraces

($\overline{\text{UI}}$) From a universal statement about the world, do not infer each instance by logic alone

Then, he reasons:

1. From a universal statement about the world, do not infer each instance by logic alone [premise]
2. From “Everything is material”, do not infer each instance by logic alone [MUI, syntax, MP]

¹⁴ To be more precise: he follows UI always and only when the universal premise is about non-linguistic entities.

3. From “Everything is material”, do not infer “Casper is material” by logic alone [MUI, syntax, MP]

Principle MUI is relevant to the inference from 1 to 2 because premise 1 is a universal statement about statements (it ascribes a property to all universal statements about the world); likewise, MUI is relevant to the inference from 2 to 3 because premise 2 is also a universal statement about statements (it ascribes a property to all instances of “Everything is material”). Barry accepted $\overline{\text{UI}}$, which is incompatible with UI. Besides, he started violating many instances of UI—more precisely, all those instances where the universal premise is about the world—and he did so by making an inference with $\overline{\text{UI}}$ among the premises. So, we can conclude that, according to our definition, Barry weakly abandoned UI.

Consider Modus Ponens now. Suppose Barry conforms to UI and VD^{\leftarrow} . Besides, he follows MP^{\neq} (recall, he weakly adopted this principle in the past!). One day, he finds the sentence κ , which is no other than “If κ is true, then \perp ”. Then, he considers the inference:

If κ is true, then \perp . But κ is true. Ergo, \perp

After asking an expert, Barry concludes that the premises are true, but the conclusion is not so (cf. Priest, 2006). He stops accepting MP^{\neq} and embraces

$(\overline{\text{MP}}^{\neq})$ For any x and y , x and “if x then y ” do not entail y

Then, he reasons:

1. For any x and y , x and “if x then y ” do not entail y [premise]
2. “ κ is true” and “If κ is true, then \perp ” do not entail \perp [UI on 1]
3. Do not infer, by logic alone, \perp from “ κ is true” and “If κ is true, then \perp ” [VD^{\leftarrow} on 2]

Barry accepted $\overline{\text{MP}}^{\neq}$, which is incompatible with MP^{\neq} . Besides, he started violating many instances of MP —more precisely, all of them—and he did so by making an inference with $\overline{\text{MP}}^{\neq}$ among the premises. Thus, we can conclude, again, that Barry weakly abandoned MP^{\neq} .

The main thought of this section was that we can appeal to the notion of adoption in two different kinds of investigation. If our aim is to analyze whether acceptance of a principle can found an inferential practice, then we had better stick to Kripke and Padró’s definition of adoption. If, on the other hand, our aim is to analyze whether acceptance of a principle can guide an agent to revise her *logica utens*, then it is best to consider a weaker notion of adoption. Sometimes,

Universal Instantiation and Modus Ponens are adoptable (and indeed, also abandonable) according to this weaker notion.

5. What the Adoption Problem Does Not Show

In this paper, I defended two claims. The first was that the Adoption Problem is compatible with the thesis that logic is revisable in the following sense: that we change our *logica utens* by just accepting some logical principles as premises and drawing their consequences. The second was that, if we want to analyze whether an agent can revise their *logica utens* in the abovementioned sense, then we had better stick to what I call a weak notion of adoption, according to which, sometimes, Universal Instantiation and Modus Ponens are adoptable.

Based on what I have argued so far, I now present what I think is the scope of the Adoption Problem:

- *It shows that logic is special*: basic logical principles are not just “further statements” in our total system of beliefs.
- *It shows that our logica utens is not something we adopted*, viz. it is not just the result of having accepted some principles and then drawn their consequences.
- *It shows that at least some basic logical principles do not guide our inferences*, and so the intentional rule-following account of inference cannot be true in general.

On the other hand,

- It does not show that we cannot revise our *logica utens* by accepting some logical principles as premises from which we draw consequences. In other words, *it does not show that we cannot adopt a logic, in Kripke’s sense of adoption*. (This I argued in Sect. 3.)
- It does not show that we cannot revise our *logica utens* by accepting the principles of Universal Instantiation and Modus Ponens as premises and then drawing their consequences. (This I argued in Sect. 4.)

Now, even if the Adoption Problem does not show that we cannot revise our *logica utens* in the way mentioned, I think it provides fairly strong inductive support for this thesis. The idea is that, given that at least some principles of our *logica utens* cannot be adopted or abandoned—not even weakly—it is plausible to assume that in general, principles of our *logica utens* are not the kind of thing that we adopt or abandon at will. I claimed that the Adoption Problem is compatible with the view that sometimes we revise our *logica utens* by (maybe weak)

adoption or abandonment. However, I think that anyone who wants to hold this view must answer at least three challenges:

- (i) to say where to draw the line between the adoptable and the unadoptable principles,
- (ii) to give principled reasons for drawing the line where it is drawn, and finally
- (iii) to say what are the merits of such a dualistic conception of inference.

The reason why (i) is still unsettled—or so I think—is that an interesting philosophical discussion remains to be had around, for example, LNC and ADJ (principles which, as mentioned in Sect. 1, Kripke considers plausible witnesses of the Adoption Problem). The reason why (ii) is relevant is that, wherever we chose to draw the line between the adoptable and the unadoptable principles, we should be able to explain our choice and, ideally, provide some interesting property that all and only unadoptable principles have. Lastly, notice that, if somebody claims that we sometimes revise our logic by adopting and abandoning principles, and at the same time they admit the main conclusion of the Adoption problem—namely, that some principles cannot be adopted—then this person embraces a kind of dualistic epistemology of logic: some principles of our *logica utens* are just “further statements” that we choose to endorse, but some other principles are not. Every dualistic stance or theory has an obvious drawback: it is uneconomical. To answer (iii) is to say what merits would the dualistic epistemology have, such that it compensates its uneconomical character.

Acknowledgements

Earlier versions of this essay have been presented at the *Work in Progress Seminar* of the Buenos Aires Logic Group and at the *Young Scholar Series* of the Saul Kripke Center; I would like to thank the attendees of these talks for their valuable feedback. I am particularly grateful to Eduardo Barrio, Saul Kripke and Romina Padró for their enlightening discussions on the Adoption Problem, taking place in graduate seminars held by Prof. Barrio at the University of Buenos Aires and by Profs. Kripke and Padró at the City University of New York.

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Received 27th February 2021; revised 7th September 2021; accepted 5th December 2021.