

ON THE VERY IDEA OF CHOOSING A LOGIC: THE ROLE OF THE BACKGROUND LOGIC

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Abstract

Logical anti-exceptionalism is the view that logic is not special among the sciences. In particular, anti-exceptionalists claim that logical theory choice is effected on the same bases as any other theory choice, i.e., by abduction, by weighting pros and cons of rival views, and by judging which theory scores best on a given set of parameters. In this paper, we first present the anti-exceptionalists favourite method for logical theory choice. After spotting on important features of the method, we discuss how they lead to trouble when the subject matter of choice is logic itself. The major difficulty we find concerns the role of the logic employed to evaluate theory choice, or, more specifically, the role of the metalanguage employed to run the abductive method. When rival logical theories are being evaluated and compared, we argue, it is difficult not to beg some important questions; the metalanguage introduces biases difficult to avoid. These difficulties seem to be inherent to the method described. We suggest that they put some constraints on the scope of application of the method of abductive theory choice in logic and on the kind of disputes the anti-exceptionalist may plausibly expect to solve with it. We end the paper with some suggestions for how the anti-exceptionalist may address these issues on this front.

1 Introduction

Logic is typically conceived as being *a priori*, necessary, and analytic. In this traditional view, at least *prima facie*, there is no sense attached to the idea of choosing a logic, or of revising logic, in the face of any kind of (conflicting) evidence. Now, despite its venerable credentials, this

traditional view has been attacked, among others, by Quine, and most recently, by the so-called *anti-exceptionalists*. Hjortland characterizes logical anti-exceptionalism thus:

Logic isn't special. Its theories are continuous with science; its method continuous with scientific method. Logic isn't a priori, nor are its truths analytic truths. Logical theories are revisable, and if they are revised, they are revised on the same grounds as scientific theories. [Hjortland, 2017, p. 632]

The anti-exceptionalist plan for logical theory revision is that whatever it is that counts as our current logical system, it may be replaced by a more suitable system after all relevant matters are considered, just like Newtonian physics was replaced by the Special Theory of Relativity, so to say. This possibility has captured the attention of many philosophers who are fond of the idea of having *a method* for logical revision and logical theory choice that works just like theory choice in other sciences¹. As Routley has argued,

Choice of a logical theory is a special case of the choice of a theory or a system, and choice of these does not differ in principle from choice of such diverse items as a new house, a winner (e.g. of a gymnastics or equestrian contest), or of a recording of a symphony. [Routley, 1980, p. 81]

In this sense, the plan for logical theory choice sounds rather simple: choose some features that count as important virtues a system of logic ought to have (explanatory power, capacity of systematization and simplicity, for instance), evaluate how well the competing logical systems fare according to those virtues, and choose the one that scores best. The idea seems simple, and employs a method we seem to be familiar with when choosing a new car or a new umbrella. Far from being a non-sense, logical revision — from this perspective — is just part of the scientific enterprise of finding the theory that best squares with the evidence we currently have; in the case of logic, the concern is with inferences, but there is nothing special about it, the process is similar to any other process of theory choice.

¹Logical revision and logical theory choice are used almost as synonymous in the anti-exceptionalist literature. Here, despite our reservations concerning it, we follow common practice.

However, in spite of its attractiveness, to assume this analogy between logical and scientific theories is not exempt from problems. In a nutshell, in the following paper we shall explore the following concern: given that the process of theory choice requires inferences to be made, and that these require that a system of logic is already settled to guide the inferential steps, the process of *logical theory choice* seems to presuppose the use of a logic, and this fact, we shall argue, leads us to beg the question against those in disagreement over what concerns the most appropriate logic to be used. As we shall explain, this type of choice procedure is vulnerable to some kinds of circularity, thus leaving room for non-rational features².

The paper proceeds as follows. In section 2 we briefly revise the anti-exceptionalist method for logical theory choice. In section 3 we advance two major arguments against this method. As we have already mentioned, the arguments concern the relation between the logic we use to evaluate logical choice and the evidence in favour or against distinct systems. We conclude in section 5 by suggesting that these difficulties may be overcome if the anti-exceptionalist could better specify the sort of logical disputes to which the theory choice method being discussed is applicable. We also indicate lines in which this suggestion may be carried out.

2 The anti-exceptionalist basic tenets

In this section, we shall provide for a clear assessment of the main features of anti-exceptionalism view on logical theory choice. There are certainly further aspects of anti-exceptionalist views of logic, such as its modal status and analyticity issues, but we shall not discuss them here. We shall concentrate on logical theory choice and bring to light two special features of the process recommended for such.

The first aspect of the versions of anti-exceptionalism that are being taken into account here, and that must be further specified, is that it is widely assumed that we use a logic for reasoning in natural language.³ This involves the so-called *canonical application of logic*, the use of logic for studying the validity of inferences in natural language, as opposed

²Some of these problems are already known by authors such as Hjortland [2017] and Woods [2017]. Our purpose in the following paper is to explore how these elements play a role in the process of decision by abductive means.

³See Priest [2006].

to a purely mathematical study of logic on the one hand, as well as to the applications of logic in technology; for instance, in the study of electric circuits. In other words, it is assumed that natural language does embody a logic (the so-called *logica utens*, in medieval terms), and when one considers logical revision, or choice of a logical system, one is talking about this logic. As [Woods, 2017, p. 02] puts it, the target cases of logical revision that concern the typical anti-exceptionalists deal with “our most general canons of implication”, our “*background logic*”.

That means that whenever we make inferences about any subject, in particular about the most appropriate system of logic, we are already using logic, where the logic in use is the logic of natural language. Although that seems reasonable enough, as we shall see, this fact engenders difficulties for the anti-exceptionalist. It is not as if anti-exceptionalists try to pretend that no logic is needed; rather, they try to minimize the effects of the background logic in the process of logical theory choice by the rational evaluation of the theoretical virtues of disputant logical theories. Hence a natural problem is to know whether (or how) this is possible. As an example of an anti-exceptionalist that clearly deals with this issue, [Priest, 2016, p. 51] comments on that topic, claiming that there seems to be no urgent problem in that:

But some logic (and arithmetic) is necessary. Which? The logic (and arithmetic) we have. If we were trying to establish logical knowledge from first principles, then any use of logic would generate a vicious regress. But we are not: our epistemic situation is intrinsically situated. We are not *tabulae rasae*. In a choice situation, we already have a logic/arithmetic, and we use it to determine the best theory — even when the theory under choice is logic (or arithmetic) itself.

[Routley, 1980, p. 94] makes a similar case by arguing that at some point one will have to rely on natural language and the informal reasoning conducted in this language; he also claims that this informal reasoning must be reproducible in the system one claims to be the best candidate for correct system. We shall take this to be enough evidence for the claim that logic is involved in the choice of a logical theory, and that we “adopt” the logic we have in order to discuss logical theory revision, provided that *this claim* makes sense.

The second aspect of anti-exceptionalism we wish to spot on concerns the methodology of logical theory choice. According to the anti-exceptionalist tenets, recall, theory choice proceeds just as in any case of theory choice for any scientific theory. For this one must first choose some relevant factors on the basis of which the systems will be evaluated, and according to a measure attributing to each system how well it fares according to each factor. A weighted sum of the values is calculated and determines which system scores best in the end. The factors to be taken into account in the evaluation include simplicity, capacity of systematization, fruitfulness, economy (Ockham's razor), but are not limited to these.

Let us briefly present some of the features most praised in a logical system, according to some anti-exceptionalists.⁴ They seem to be uncontroversial, but we shall discuss whether this is really the case later:

- 1 **extensive scope:** logic is the science with the most extensive scope; it applies overall. Systems that do satisfy this requirement score better than those that do not apply in some specific situations (e.g. not dealing with intensional contexts).
- 2 **conformity to the facts:** there may well be logical facts, some claims that no one can deny that an appropriate logic should account for (for instance, that a conditional is false when its antecedent is true and its consequent is false). A system of logic not accounting for the logical facts is ruled out as inadequate.
- 3 **accountability of the data:** our linguistic practices may provide important data that a logical system may have to account for. The data are somehow 'soft', theory laden, and one may sometimes reject the data if a theory has many other relevant virtues.
- 4 **explanatory power:** it is not enough to catalog the valid inferences. A logical theory must explain why such inferences are valid or invalid, i.e., give an account of validity that illuminates the valid and invalid consequences.

Now, suppose we have agreed on a list of factors that must be taken into account in logical theory choice, among which the above factors may be included. We provide a list of such factors:

⁴Here we follow the list presented in Routley [1980], but see also Priest [2016].

$$c_1, c_2, c_3, \dots, c_n$$

Distinct factors may even be evaluated differently. For instance, simplicity may be less important than conformity to the facts and/or explanatory power. Consistency may be also less important for some (e.g. paraconsistent logicians), and not even counted as a relevant factor that a system of logic must possess. This difference in the importance of each factor is reflected in the anti-exceptionalist model by assigning each criterion c_i a weight w_i , which is taken into account in the evaluation process. In the end, once every criterion receives a weight and a value according to a measure m , we have what Priest [2016] calls a *rationality index* for theories, a weighted sum of each of the criteria:

$$\rho(T) = m(c_1)w_1 + m(c_2)w_2 + \dots + m(c_n)w_n \quad (1)$$

Although it is clear that while the method operates on a given list of relevant factors, it is not clear how to motivate the selection of some factors as having priority over others. For instance, Routley draws a distinction between *heavyweight* and *lightweight* factors, in which the former includes theoretical factors like scope, conformity to the data and explanatory power, and the latter includes aesthetic factors like simplicity and elegance. In a different perspective, Williamson's anti-exceptionalist defense of classical logic is based on prioritizing factors like scope, elegance and simplicity.⁵

Furthermore, even where authors coincide in choosing some factors as of greatest importance, there may be disagreement over how to properly understand them. For instance, consider adequacy to the data and conformity to the facts. These may or may not be distinct factors, depending on how one further specifies the terms 'data' and 'facts'. Routley [1980] distinguishes between data and facts, while Priest [2016] does not. For the sake of argument, in this paper we shall not distinguish between data and facts. What is relevant for us is that even if there is agreement that a logical theory must be faithful to the data and/or facts, it is not clear which facts and/or data are relevant. Routley [1980], in particular, presents the following list of Facts that must be accounted for by a system of logic:

- Fact 1) Much of our discourse is intensional (while classical logic is extensional).

⁵See Williamson [2016].

- Fact 2) Much of philosophical discourse is about the non-existent.
- Fact 3) There are inconsistent non-trivial theories and inconsistent non-trivial situations (while classical logic is explosive in the face of inconsistency).

Notice: consistency is not welcome here! If we take this list at face value, classical logic fails to meet the facts. And as we have already mentioned, the choice of factors to be taken into account in logical choice is not without problems. As the reader may foresee, the discussion over which are supposed to be the relevant facts may also bring in a great deal of trouble, for the very choice of relevant facts may be detrimental to the rationality of the choice procedure.

In the following, we explore two kinds of problems related to the anti-exceptionalist choice method: 1) the role of the logic we have as the base logic for logical theory choice, and 2) the role of the background logic in the metatheory and the selection of the relevant logical facts.

3 No neutral metalanguage

The anti-exceptionalist recommends that logical theory choice must be carried through by the logic we use in a given language, i.e., we should employ *the logic we have* for running the choice procedure. In this section, we shall start by arguing that the logic we have may play a major role in the process of logical choice.

We start with the Kripkean objection that logic is not revisable (see Berger [2011]). Kripke argued that the very idea of adopting a logic does not make sense, in light of the fact that adoption of a logic already presupposes that a logic is given. We shall leave this more skeptical ring aside, dealing with a challenge for the claim that one can coherently change logic when a logic is already given. The argument indicates that the metalanguage we do employ impacts on the possibility of evaluating evidence against our current system. This makes the role of the logic we have much more relevant to the evaluation of a dispute than the anti-exceptionalists are willing to concede. The logic we use in the evaluation of distinct candidates to revise it impinges on the very result of the evaluation Berger [2011].

For the Kripkean argument, the desired conclusion is reached by a kind of thought experiment. We shall call it the perverse inference

(PI) argument, and it runs as follows. Suppose someone believes that from ‘every x is B’ it follows logically that ‘ x is **not** B’ (this is the perverse inference). We may also assume that the user of PI does not accept universal instantiation (UI), given that this would make for an inconsistent set of rules (not impossible, of course, but let us not take it into account for the moment). Consider an opponent attempting to call the user of PI to her senses by arguing that this inference is fallacious and the logic containing it should be dropped. It seems plausible to suppose that the contender would have to claim something along the following lines: ‘look, every instance of PI is fallacious, so that this inference you made is fallacious’ (this is an instance of universal instantiation). The friend of PI may agree on the relevant data (every instance of PI is fallacious), but disagree on what results from it and on the need of revision. *Nota bene*: there may even be agreement between the two contenders over the truth of the premise, without that implying that the user of PI could agree that she needs to change logic; she may simply not get to the claim that some particular inference of hers is fallacious when she applies her accepted forms of reasoning. The user of the rule PI could claim that, by using the rules of inference she accepts, even if the contender is correct in claiming that every instance of PI is fallacious, the conclusion the contender wishes her to accept does not follow. In fact, by using PI we have: ‘Every instance of the rule PI is fallacious, therefore, this instance is not fallacious’. As a result, the evidence available for both, friend and foe of PI, may be the same, but the *logic the friend of PI* has as her background logic may not allow her to see that the PI rule must be revised. The patterns of inference we already *use* won’t allow us to change our inference rules in these cases [Berger, 2011, p. 185]. Basically, once a set of inference rules is assumed, we can’t see the problem with them, because we are always operating with them to judge the data available. In other words: the claim that some set of inference rules is fallacious can’t be justified when one employs that same set of inference rules. The trouble with those inferences must be seen ‘from the outside’, as it were, given that someone using that set of inference rules will not think she is inferring illegitimately.⁶

⁶One might object that Kripke’s example is too borderline, since, in many logical disputes, the disputants agree on some (or perhaps even most) inference rules. However, even if they disagree over one inference rule relative to a single logical constant, it is not clear that one disputant will then be able to “adopt” the point of view of the

This last remark leads us to our second point, which generalizes the first one. The Kripkean argument shows that the logic adopted in the metatheory determines which inferences are accepted and therefore brings trouble to any process of theory choice. We shall argue further that this kind of consideration may be expanded to other features of the choice procedure. In particular, the metalanguage and metalogic we have (or think we have) infiltrates in the process of theory choice not only by the inferences accepted, but also by interfering on how we judge simple issues such as *the choice of relevant factors* for theory evaluation. Philosophical agendas infiltrate, consciously or unconsciously, in these discussions. Consider, for instance, the logical facts which a system must accommodate in order to be appropriate. What is taken to be a logical fact, or the data, is already logic-laden, as it were, and the facts that must be taken into account already reveal the preferences of those in the dispute. Problems of this kind are already known in the philosophy of science, where the available data needs to be described within the language of the old theory and therefore are susceptible to all the biases inflicted by the old theory.

Hence, our claim is that choice of the relevant factors on logical evaluation is very much purpose driven, and the purposes one has in mind as the most relevant ones determine the factors that weight more. Our focus will be on the broad features of a logical system. Given that logic is involved with many important concepts, it is also open to bias infiltration in any consideration of theory choice. As [Priest, 2016, p. 39] puts it:

The central notion of logic is validity, and its behaviour is the main concern of logical theories. Giving an account of validity requires giving accounts of other notions, such as negation and conditionals. Moreover, a decent logical theory is no mere laundry list of which inferences are valid/invalid, but also provides an explanation of these facts. An explanation is liable to bring in other concepts, such as truth and

other, so that Kripke's worries could be overcome. There are many very interesting cases of logical disputes of this kind, in which the minor difference in the assumption/rejection of the inference rule in dispute carries with it many consequences that imply the change in a number of philosophical assumptions by each party. Such is the case of the dispute between paraconsistent logics and classical logic, with its far-reaching consequences for our theories of truth.

meaning. A fully-fledged logical theory is therefore an ambitious project.

That is, logical theorizing is already involved in basic matters such as the meaning of the connectives and truth, not only logical consequence. In fact, logical consequence and the logical vocabulary are often intertwined, so that it is not clear how to changing one without altering the other. When discussing logical theory choice, these features are also involved. Furthermore, when one assumes, as anti-exceptionalists typically do, that a logic must be available for us to actually use it in the process of logical theory choice, these items (connectives and their meanings, a theory of truth or, at least, a view on how truth behaves) are also assumed as settled in the logic we use. As a result, the logic one uses impacts on theory choice not only with its notion of logical consequence, but also with its accompanying meaning for the connectives and (importantly) its available notion of truth.

In order to illustrate how the argument of the impact of the features of the metalanguage would run in this broader scenario, let us focus on the informal semantic characterization of logical consequence:

Def[**Logical consequence**] A follows from B iff in every case in which formulas in B are true, A is also true.

One obtains a specific notion of logical consequence provided that the very concept of ‘cases’ is made more precise. What is the range of the quantifier in the definition of logical consequence? The cases that one needs to have available are the cases that make the premises and conclusions of inferences holding or not.⁷ One evaluates inferences on the set of cases available.

This issue hinges on the data that must be accounted for by any candidate system of logic, and on the facts that logic must convey. Recall Routley [1980] enumerating the ‘facts’ that must be accounted for: Fact 1) Much of our discourse is intensional; Fact 2) Much of philosophical discourse is about the non-existent; Fact 3) There are inconsistent non-trivial theories and inconsistent non-trivial situations.

The facts to be accounted for already reveal some features of an intended underlying logic. Let us focus on fact 3. The claim that there

⁷We use the neutral ‘holding’ instead of true or false to allow cases where there may be more than just the two truth values.

are inconsistent non-trivial theories makes it analytic that the underlying logic must be paraconsistent. In fact, that encompasses the very definition of paraconsistency, so that it results analytically that a paraconsistent logic must be adopted if we are to take those facts into account (see also Michael [2016]). In other words: one cannot even state ‘the facts’ appropriately unless a paraconsistent negation is assumed at work in the metalanguage. Indeed: consider a classical logician using her classical connectives and concepts sincerely stating that ‘there are inconsistent non-trivial theories and inconsistent non-trivial situations’. That would be self-refuting! On the other hand, a paraconsistent logician saying that is merely a reflection of the definition of paraconsistency. So, the logic one uses in the metalanguage affects the very account of the data and of the facts.

This general kind of difficulty infiltrates from the mere appraisal of the data available to the proper assessment of the most appropriate set of rules of inference to deal with those data. That is, in order to evaluate the available inferences, one must, in this case, already accept that some of the cases available comprise inconsistent non-trivial theories or situations (or worlds). That is precisely what the classical logician will deny. In this case, there is a disagreement over what counts as a legitimate case, or a legitimate fact that a system of logic must take into account. This makes for both contenders, paraconsistent and classical logicians, using incompatible evidence, as seen from their own point of view.

Other features of the data or the cases that must be taken into account are similarly logic-laden. The idea that inconsistent cases must be taken care of in the scope of the quantifier ‘for every case’, allowing for instance that some propositions are both true and false in some cases (instantiating thus a truth value glut), or rather other way around, that every case is consistent (no gluts available), depends on the logic employed to legislate over the cases. That is, one cannot legitimately claim that some cases are available to the evaluation of propositions where contradictions obtain, for instance, without beforehand having settled that propositions are allowed to be evaluated in such situations as legitimate cases. Logic has priority over the cases by constraining the behavior of the truth values. It is precisely in this sense that the evidence available depends on the logic we assume beforehand. As a further example, not involving the notion of logical consequence, think of paraconsistent set theories based on naive principles of set formation that lead to sets such

as Russell's set; the data available for these theories are simply denied by the classical logician for their very threat of inconsistency.

When these difficulties are plugged in with the typical claim by the anti-exceptionalist, things get even more obscure. Consider the claim that the logic in the metalanguage (the one in which talk about the object system is performed) and the logic chosen as the correct one (the one that scores best) should be the same. [Routley, 1980, p. 94] is clear on this subject:

The choices of system and metasystem — more generally, system and extrasystematic adjuncts — are by no means entirely independent. It is not satisfactory for example, to reject classical logic systemically, e.g. as involving mistakes or illegitimate assumptions (such as the law of excluded middle), and to use it metasystemically without further ado or qualification; for to do so would be to proceed by what are confessedly mistaken paths.

[Priest, 2006, p. 98] puts the same point about the meaning of the logical operators (which are related to logical consequence, to be sure):

Any intuitionist or dialetheist takes themself to be giving an account of the correct behaviour of certain logical particles. Is it to be supposed that their account of this behaviour is to be given in a way that they take to be incorrect? Clearly not. The same logic must be used in both “object theory” and “metatheory”.

However, given that a metatheory is required in order to evaluate the logical choice, and once it is assumed that it must be the same logic that is available both in metatheory as in the object language, troubles arise. If we follow the advice of Routley and Priest, and choose to use in the metalanguage the account we think is correct, the evidence available will be relative to the choice of metasystem. For instance, once one has chosen a paraconsistent negation, it will be available to her that some facts may be contradictory without triviality. Those facts will not be available for a classical logician, though. Classical and paraconsistent logicians, in this setting, are talking past each other. Even if one chooses the metatheory of a paraconsistent logic able to recover the rationale of classical logic in consistent situations, the defender of classical logic may

argue that the full power of classical logic is not present, and that many of the advantages of classical logic were sacrificed for little gain.

The anti-exceptionalist may avoid this “incommensurability” between theories by requiring that the disputants must at least share the set of logical facts. This seems to result as a minimal desiderata for the kind of dispute able to be settled by anti-exceptionalist means. This move, of course, significantly shrinks the range of logical disputes treated by the anti-exceptionalist, and goes on a different direction than that pursued by authors such as Williamson [2016] and Routley [1980] in order to settle the debate between defenders of paraconsistent logics and defenders of classical logic.

The further relevant questions to be raised are: what other desiderata are required to hold for sensible application of the anti-exceptionalist method for logical theory choice? How to characterize the set of logical disputes open for treatment by current anti-exceptionalist means? When rival theories are in dispute for the description of a set of facts, the elements of the theory are present not only in the object language, but in the metalanguage as well.

A clear example of this type of problem may be seen in Priest’s ([Priest, 2006, chap.4]) discussion of Boolean negation. Given that Priest does not agree with Boolean negation, he feels free to use De Morgan negation in the metalanguage to characterize Boolean negation (in the object language). This has as a result that one cannot prove, in the object language, that Boolean negation is explosive (the inferences required for that are not available in the metalanguage). However, if a friend of Boolean negation could do the same, and characterize De Morgan negation in her own terms, then, it seems, De Morgan negation could also lead to results such as *ex falso*. It seems there is no easy way out of this kind of question begging scenario, when the supposition of being using ‘the right logic’ in the metalanguage is in force. Therefore, a natural problem is to know how to perform a non-biased choice procedure in these scenarios (assuming the parties in dispute are, indeed, comparable) ⁸.

⁸See the discussion in Arenhart and Melo [2017]. In Anderson et al. [1992] another example of this kind is introduced by the authors. Given the presence of De Morgan and Boolean negation in the object-language, if De Morgan negation is adopted in the metalanguage, then both negations collapse. However, if Boolean negation is assumed, then the relevantist can claim not to understand the classical reasoner. This is considered by the authors as illustrative of an incompatibility between the

Even when a new theory emerges against the accepted theory so that the adherents start to accept the peaceful coexistence of both, the metalanguage of the old theory is still present and spreads across all the disputants in question. This is the case because rival theories are born out of the background of the old theories. Examples of this kind are found not only in logic, but also in mathematics or in physics.⁹

4 Theory-choice loops

Our next argument against the feasibility of the method presented earlier comes from Woods [2017]. According to Woods, using a specific metalanguage in the evaluation process also engenders loops in the choice of the most appropriate logic. In a nutshell, the argument runs by creating loops in the choice of a logical system. Once a system is chosen and adopted due to its best results in the theory selection method, when the anti-exceptionalist choice procedure is performed again, now using the newly adopted system as background logic, it leads one to choose the rival (old) system back again. Hence when one changes back to the “old” logic, one sees that the rival system scores better again. And so on. The logic we use determines the evaluation of the evidence, and in some particular cases, the logic we use seems always to imply that we would be better off changing the logic. Woods’s loops illustrate how the choice of relevant factors seems not to provide enough grounds for theory choice. Some kind of choice underdetermination still arise in face of the relevant factors conjoined with the adoption of a background logic.

The most prominent example of such loops concerns a discussion between classical logic and the relevant logic T (for Tennant). The existence of a loop in logical choice is clearly illustrated here. Assuming classical logic in the metalanguage, one is able to show that T recaptures classical logic in the object language level. This opens up the possibility of obtaining all of classical mathematics that depends on the use of classical logic. Also, given that proofs in T are more informative, T seems to be preferable. That is, T scores better than classical logic, because its proofs are more informative, and one loses nothing of classical mathematics. So, a choice of T is advisable. However, once T is assumed

worldviews of the disputants.

⁹For instance, quantum mechanics needs classical physics to account for the results of its experiments. Non-classical logic is sometimes said to need classical set theory as a background.

as the logic we have and use, it is part of the language in which we evaluate the evidence for logical choice. So, let us run the method of logical choice again. When the metalanguage is T , there is no way to recapture classical logic in T , and T cannot reproduce classical mathematics. Although T is more informative on its proofs, the recapture of classical logic in order to have classical mathematics is much more important, so that it is preferable to have classical mathematics than a more informative deduction system. In this sense, from the point of view of T , classical logic is preferable. And then, the loop is created.

Similar loops seem to arise in cases of relevant logics in general, or in non-contractive logics, non-transitive logics [Woods, 2017, p. 16]. These systems recapture classical logic only when classical logic is already available in the metalanguage. So, from the point of view of classical logic, these systems should be adopted, given that they have clear advantages over classical logic when reasoning with so-called versions of naive theory of truth are concerned. However, when those systems are adopted and become the system we use, they cannot be used to recapture the full power of classical logic, and then, they fall short of providing for classical mathematics. Again, the result is that it is preferable to have classical mathematics than these treatments to the paradoxes of self-reference. Thus, from the point of view of such sub-structural logics, classical logic should be adopted as preferable. The loop reappears.

A possible solution is found by following a suggestion of Bueno [2010]. Bueno argues that disagreements about which logic to choose must proceed by employing a logic, but that this logic need not be the same logic that is under evaluation. The logic in the metalanguage does not need to be the same as the logic in the object language. That is, we may disagree on which logic to choose for a given purpose (inferences in natural language, say), but may agree on which logic to use when we conduce disputes about that. For instance, it is possible that we could agree that we may use classical logic to debate over which logic to use when dealing with inferences in natural language.

Bueno's strategy goes in a direction already pointed out in Dummett [1991]. For Dummett, in order to solve logical disputes the disputants must agree on a metalanguage that is completely insensible to the object-language. As described by the author:

What is needed, if the two participants to the discussion are to achieve an understanding of each other, is a semantic

theory as insensitive as possible to the logic of the metalanguage. Some forms of inference must be agreed to hold in the metalanguage, or no form of inference can be shown to be valid or to be invalid in the object-language; but they had better be ones that both disputants recognise as valid. Furthermore, the admission or rejection in the metalanguage of the laws in dispute between them ought, if possible, to make no difference to which laws come out valid and which invalid in the object-language.(...) If both disputants propose semantic theories of this kind, there will be some hope that each can come to understand each other; there is even possibility that they may find a common basis on which to conduct a discussion of which of them is right. [Dummett, 1991, p. 55]

Dummett's concern with an agreement relative to the metalanguage comes from the fact that he takes it to be a pernicious principle to require the coherence between the metalanguage and the object-language of the disputant theories. The reason for this is that when this coherence is achieved, the defender of a non-classical logic can always resist arguments in favour of a classical law rejected by the non-classical adopter, namely, by claiming that the argument assumes the validity of the law in the metalanguage. However, this same counter-attack is often presented by defenders of classical logic against attempts of showing how to recover the classical derivations within non-classical theories.

Could then Dummett-Bueno's strategy work for the purposes of the anti-exceptionalist? It seems it couldn't, for many distinct reasons. First, assuming that the logic we use to discuss adoption of logics may be distinct from the systems that are under discussion, we beg the question against the logical monist, who accepts that only one logic must be true. As a second point, the logical monist may claim that discussions as to the most reasonable system of logic involve cases of inferences in natural language, so that if we agree on which logic to use in *this discussions*, then we have already settled the issue. Third: by claiming that we must agree on a metalogic, one could ask: how is this agreement achieved? By the method of the anti-exceptionalist? But then, the problems we have just examined reappear, and the suggestion amounts to no real progress at all. On the other hand, if the metalogic is not chosen by these standards, then, there are other means by which to choose a logic,

and the relevance of the anti-exceptionalist method for logical choice is lost. Both horns of the dilemma seem to lead to trouble. On the one hand, to require the coherence between object-language and metalanguage may not allow us to characterize the dispute as a *genuine* logical dispute; on the other hand, dispensing such coherence may lead to the irrelevance of the anti-exceptionalist method.

These arguments have shown, again, that the metalogic one has in the background, in other words, the logic we use in conducting logical theory evaluation, plays a pivotal role much more detrimental to the choice of a logical system than the anti-exceptionalists seem willing to concede. In order to settle these issues, the anti-exceptionalist must adequately characterize — probably by restricting — the set of logical disputes their method is supposed to apply for.

5 Conclusion: possible routes

In the present contribution we have exhibited a set of problems related to the anti-exceptionalist strategy of selecting logical theories through abductive means. We argued that all these obstacles arise from the idea that logical theory choice has to be performed from a background logic. For this, we presented different types of ‘intrusions’ that the background logic may employ during the process of theory choice.

On one hand, if the principle of uniformity between theory and metatheory is to be demanded as a desiderata for logical theory choice, then it is not clear how to avoid the biases inflicted by the background logic. On the other hand, if uniformity is not demanded, then any choice procedure also seem to result problematic.

All difficulties raised in the previous section point to a limitation of the anti-exceptionalist method due to the absence of an adequate characterization of the set of logical disputes intended to be accounted. Even if the anti-exceptionalist drops the assumption that we employ our background logic in the choice procedure, she still ought to establish what kind of logical dispute she takes to be genuine and susceptible to be settled by the proposed abductive means. Based on what has been discussed, we introduce below a set of desiderata for a possible logical theory comparison, which an anti-exceptionalist will have to take into account in order to avoid the difficulties raised here:

- **Set of logical facts:** As discussed in Section 3.1, a minimal

desiderata for the existence of a genuine logical dispute seems to be that the disputants share the same set of logical facts. One may suggest that a difference in the set of logical facts can be handled by the existence of a translation between the vocabularies of the logics in dispute. However, even when charitable interpretations of the principle in dispute are available for one of the disputants, problems like the ones mentioned in Section 3 appear again, namely the choice of metatheory may intrude the description of the relevant factors from the point of view of the disputant.

- **Coherence between object-language and metalanguage:** The horns of this dilemma were discussed in Section 3.2. However, it seems that for the pluralist this is no practical requirement. The pluralist might accept very well that the metalanguage of an old theory is kept within the disputant logic. The relevant question then is why would the pluralist want to choose among logics, to begin with? A local pluralist in the sense of Da Costa and Arenhart [2018] may just want to find the (provisionally) best tool for a specific job. The anti-exceptionalist ought to seriously take the issue of how pluralist or monist commitments might infiltrate into the choice procedure. Anti-exceptionalists like Hjortland [2017] have defended that the anti-exceptionalist ought to promote a form of ecumenism. However, it is not clear how ecumenical one can be when choice of metatheory is in play.¹⁰
- **Agreement on the set of heavyweight epistemic virtues:** Another important desiderata for a genuine logical dispute in the sense intended by the anti-exceptionalist is that the parties in dispute agree at least on the set of heavyweight epistemic virtues, i.e. the set of epistemic virtues they take to be most important. Many anti-exceptionalist arguments talk past each other because different epistemic virtues are prioritized.

It might very well be the case that the fulfillment of these conditions will significantly reduce the range of application of the anti-exceptionalist method. It shall remain as a future work the development of a precise characterization of the desiderata above. However, to establish them would clarify the usefulness and the very possibility of coherently choosing logics by abductive methods. The anti-exceptionalist

¹⁰See Read [2006] on this matter.

might prefer to work and produce logics that she is sure to be comparable through abductive means.

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