On the Metaphysics of (Epistemological) Logical Anti-exceptionalism

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Abstract.   A recent logical anti-exceptionalist trend proposes that logical theories are revisable in the same manner as scientific theories, either on grounds of the method of theory selection or on what counts as evidence for this revision. Given this approximation of logic and science, the present essay analyzes the commitments of both these varieties and argues that, as it currently stands, this kind of anti-exceptionalism is committed to scientific realism, that is, to realism about some unobservable entities evoked in logical theories. The essay argues that anti-exceptionalism cannot be separated into metaphysical and epistemological varieties, and proposed rather to label anti-exceptionalists views either broadly in terms of theory revision, or narrowly in terms of logic's affinity with science.

Keywords: Logical anti-exceptionalism ● abduction ● scientific realism ● logical realism

1. Introduction

Recent trends in the philosophy of logic, under the title of anti-exceptionalism, propose that the principles of logic are not to be justified solely by *a priori* intuitions, but rather by *a posteriori* or empirical evidence. For the anti-exceptionalist, our best logical theory is not immutable, and thus is subject to revision.

One enticing proposal of how to revise logical theories is to borrow a method from another area, which has been very successful in its theory revision: science. This insight of treating logic as a science allows for logical theories to be rationally revisable,[1] and thus it is perfectly in line with anti-exceptionalist ambitions. This common approach among anti-exceptionalists Priest (2016), Williamson (2017), Hjortland (2017) takes logical knowledge and revision to follow what they accept to be the methodology of justifying theory choice in science: abduction[2], or "inference to the best explanation". In this sense, if logic is to be revised by means of inference to the best explanation, then it means that there is an objective way to decide on which is the best explanation. Using an "inference to the best explanation" to justify theory revision in the natural sciences is commonplace in the literature of scientific realism, but has not gone uncontested by philosophers of science. Scientific realism

takes that the theory which provides the best explanation, according to some theoretical virtues (simplicity, strength, adequacy to the data, and so on), is the one most likely to be true. It seems that the anti-exceptionalist embraces this view too quickly, without pausing to consider its commitments and implications for logic. The current essay explores this theme and proposes that by endorsing abduction as the hallmark of science, anti-exceptionalism (in this particular form) commits itself to scientific realism.

The connection between scientific realism and logic may seem odd, but these matters are not that far afield. Michaela Mcsweeney (2018) already hints at a connection between anti-exceptionalism and logical realism, such that the idea that anti-exceptionalism is further committed to scientific realism is not implausible, given that the anti-exceptionalist view being analysed here explicitly makes claims about unobservable aspects of both logic[3] and science. She points out that there are many shared assumptions (although for different reasons) between the anti-exceptionalist view and logical realism, since both reject that: "inquiry into logic is special and distinct from other kind of theoretical inquiry; that logic is not revisable; and that logic is wholly *a priori*, whereas other kinds of inquiry are not" (Mcsweeney 2018, p.1).

The main argument in the present essay is that by embracing abduction as the method for theory revision in logic, this kind of anti-exceptionalism becomes committed to logical realism. Such argument will be presented in the context of Hjortland & Martin's (2019)[4] suggested taxonomy of anti-exceptionalist positions. They propose a distinction between a metaphysical and an epistemological variety, where the latter kind is further divided into methodological and evidential. The current essay argues herein that such taxonomy is flawed, because the distinctions presented do not hold up to scrutiny. It is argued that methodological and evidential anti-exceptionalism amount to the same view, inasmuch as the matter of method and evidence (as presented by them) are intrinsically related. It is also argued that the distinction between metaphysical and epistemological anti-exceptionalism cannot be maintained, as the epistemological variety of anti-exceptionalism (as presented by them) is already metaphysically committed.

The essay runs as follows: Section 2 presents Hjortland & Martin's (2019) taxonomy of anti-exceptionalist views and criticizes the distinction between the methodological and the evidential varieties, to the point that both views characterize a form of scientific realism; Section 3 argues that the distinction between metaphysical and epistemological varieties is also misplaced, because the epistemological variety is also metaphysically committed; Section 4 concludes by suggesting some adjustments in the anti-exceptionalist taxonomy, by delineating other ways anti-exceptionalism about logic can be explored. If one rejects the label of scientific realists and still wishes to be an anti-exceptionalists, there are brighter avenues to pursue when it comes to theory revision in logic.

2. Varieties of anti-exceptionalism

Hjortland & Martin (2019) present two main varieties of anti-exceptionalists positions: metaphysical anti-exceptionalism and epistemological anti-exceptionalism. The first kind holds that "[t]he content of logical theories is unexceptional" (Hjortland & Martin 2019, slide 6), while the second holds that "[t]he justification of logical theories is unexceptional" (Hjortland & Martin 2019, slide 6). Within epistemological anti-exceptionalism, two further varieties are delineated, namely, methodological anti-exceptionalism and evidential anti-exceptionalism.

While methodological anti-exceptionalism is presented in terms of the mechanism of theory choice being the same as the one for science (presently taken to be the abductive method), evidential anti-exceptionalism is presented in terms of the data for logical theories being similar to those of other sciences (and not solely *a priori* or analytic). In the present section, the distinction between methodological and evidential anti-exceptionalism is criticized, the distinction between metaphysical and epistemological varieties being addressed in Section 3.

Methodological anti-exceptionalism approximates logic to the epistemology of science via the abductive method. Similar claims are made elsewhere, such as "theories of logic, not unlike scientific theories in general, are chosen on the basis of abductive arguments" (Hjortland 2017, p.2), or that "we can use normal scientific standards of theory comparison in comparing the theories generated by rival consequence relations" (Williamson 2017, p.14). Evidential anti-exceptionalism conducts this approximation by denying that logical truths are justified by *a priori* evidence, that is, denying that logics are supported by a special kind of evidence. This denial might be achieved by doubting "the significance of the distinction between *a priori* and *a posteriori* knowledge" (Williamson 2007, p.189), or by denying that "the linguistic or conceptual content [of a logical theory] provides *a priori* access to logical knowledge, for instance because the claims are analytic" (Hjortland 2017, p.13).

Methodological anti-exceptionalism may be summed up as the view that "treats revision of logic analogously to revision of scientific theories, applying familiar abductive standards of scientific theory choice to the case of logic" (Woods 2017, p.1). A useful systematization, is thus:

P1 Logical theories can be revised.

P2 The epistemology of logic is similar to that of science.

P3 Science uses the abductive method of theory revision.

∴ Logic is revised abductively.

P1 is a basic anti-exceptionalist tenet, while P2 is specific to epistemological anti-exceptionalism, and P3 to methodological anti-exceptionalism.

One such abductive proposal for theory selection is that of Graham Priest (2016), called the "Weighted Aggregate Model". In this model, theories are evaluated by different criteria (which in turn are given different weights) and a simple calculation suffices to adjudicate which is the more suitable theory. The exact criteria are not particularly relevant to the discussion of the model,[5] but the mentioned criteria are: adequacy to the data, simplicity, consistency, (expressive) power and avoidance of ad hoc elements.

Another proponent of abductive selection for logical theories is Timothy Williamson (2017), who similarly argues that the best logical theory can be chosen based on an "inference to the best explanation". For him, the criteria used in such arguments are: fit with the evidence (or at least consistency with the evidence), (deductive) strength, simplicity, elegance and unifying power.

The abductive methodology on its own does not favor (or should not, in any case) a specific logic. So while Priest (2016) and Hjortland (2017) favor non-classical logics, Williamson (2017) favors classical logic (aligning himself with Quine on the point of the too high cost of adopting a non-classical logic). Also noteworthy is that there is no consensus on the best criteria for selecting logics even among anti-exceptionalists. While both Priest and Williamson take as a "virtue" that a logic has power/strength,[6] Gillian Russell (2018) holds that this feature can also be taken as a "vice".

The main issue with abduction in logic is related to the point of what counts as data or evidence when formulating abductive arguments for selecting logical theories. It is fruitful to investigate what is considered to be logical evidence, that is what is the data logical theories seek to explain. Following a broad anti-exceptionalist view, in order for logic to not be an an exceptional discipline, the revision of logical theories ought to be supported by a kind of evidence similar to the other sciences.

For evidential anti-exceptionalism, then, what is un-exceptional about logic is its evidence: "it doesn't follow from the content of a logical theory being linguistic or conceptual that we come to know it *a priori*" Hjortland (2017, p.13). A useful reconstruction is thus:

P4 Logical theories can be revised.

P5 The epistemology of logic is similar to that of science.

P6 The evidence in science is non-*a priori*.

∴ Logical theories are revised based on non-*a priori* evidence.

Again, P4 and P5 are assumptions from a broad anti-exceptionalist view and from epistemological anti-exceptionalism, respectively. P6 is specific to evidential anti-exceptionalism, making claims about the evidence for science.

In the conclusion of the above argument, the idea of using evidence of some kind to justify the revision of logical theories is introduced. This issue is the same as what

counts as data when formulating abductive arguments for selecting logical theories, already commented above. This points to an entwinement between both kinds of epistemological anti-exceptionalisms, because there hidden in P3 above a assumption within the method of theory revision which needs to be accounted for: the data that warrants theory revision.[7] This account of the data can be supplied by taking into account the kind of evidence that logical theories use, which is "the scientific kind". What about *a priori* evidence? Due to the role evidence/data has within the abducted methodology in science, allowing for *a priori* evidence would make logic rely on exceptional evidence, and such method would be unlike the scientific abduction.[8] If one wishes to use an abducted-like methodology on *a priori* evidence, such method would need to be independently motivated, or supported by very strong realist assumptions about the structure of reality.[9]

It seems that methodological anti-exceptionalism cannot be made independently of the evidential variety, and thus a more complete account of epistemological anti-exceptionalism could be thus:

P7 Logical theories can be revised.

P8 The epistemology of logic is similar to that of science

P9 Scientific theories are based on non-*a priori* "scientific evidence".

P10 Science also uses the abductive method of theory revision.

∴ Logical theories are revised abductively, and

∴ Logical theories are revised based on non-*a priori* evidence.

In this more complete version, methodological anti-exceptionalism (P7-P10) clarifies the data used in theory revision. The suggestion here is that methodological anti-exceptionalism needs both P9 and P10, and cannot be made independently from evidential claims.[10] This double kind of anti-exceptionalism can be dubbed abductivism in logic, following the terminology of Hjortland & Martin (2019), and there are ample examples from the literature.

Williamson (2007) maintains that there is no clear distinction between analytical and empirical justification. The line between philosophy and science is blurred, philosophy and science sharing the same kind of evidence. Logic piggybacks on philosophy and also shares the same kind of empirical evidence as the sciences. Later on, Williamson (2017) argues for the use of the abductive method to select logical theories.[11]

Other claims about the evidence for a logical theory being empirical are made by Hjortland (2017), who says that "the evidence for a logical theory can come from a number of sources: from intuitions about validity or alethic modality, from mathematical theories and practice, from psychology of reasoning, from epistemic norms of rationality, and so on" (Hjortland 2017, p.14). On his view, the evidence for logic is not only empirical, but also on par with "the same grounds" used to revise scientific theories.

There is another knot to untangle in relation to the metaphysical assumptions of there being a kind of a particular "scientific evidence". It will be argued that evidential anti-exceptionalism needs both P9 and P10, collapsing methodological and evidential into the same view.

The evidential anti-exceptionalist claims that logical knowledge is not only *a priori*, but like the other sciences, it justifies its theories in terms of *a posteriori* considerations. In order to contrast armchair philosophical knowledge and scientific knowledge, the evidential anti-exceptionalist view presupposes that there is a distinct kind of evidence which lends itself to becoming scientific truths, and claims that logic has the same kind of evidence as the rest of the sciences, and thus the same kind of relation to reality. Logical theories, just as scientific theories in general, are meant to explain some evidence, and there is a way to compare theories in terms of their explanatory capacity, such that one theory can be the most suitable to explain the given evidence. The task of logic as a discipline is then, given some evidence, formulate the best explanation for such evidence. This evidence takes the form of instances of valid arguments, which ought to be generalized into a theory of validity. In this view, theories of validity are on par with theories in science.

Such an account is strikingly similar to the view which Richard Rorty (1990) presents as (scientific) realism. In the realist view described by Rorty, the realist holds that science is successful in attaining knowledge and long lasting agreement because it is "'guided' to such agreement by the way the world is in itself" (Rorty 1990, p.49). For the scientific realist, the world will direct us to a correct description of itself, which is explained "on the basis of something called 'the relation of scientific inquiry to reality' — a relation not possessed by all other human activities" (Rorty 1990, p.54).

From its evidential component, epistemological anti-exceptionalism claims that the evidence for logical theories are akin to the evidence of the scientific kind. From the methodological component of epistemological anti-exceptionalism, one gets that such evidence lends itself to a particular kind of knowledge creating process, called abduction. Granting both views, just as abduction is the method of scientific realism,[12] abduction is also the method for this brand of anti-exceptionalism.

If anti-exceptionalists welcome the commitment to validity being as real as other "unobservable aspects of the world described by the sciences" (Chakravartty, 2017),

all the better for them. Yet it is not right away clear that anti-exceptionalism should lead down this path, and if this is to be avoided, the un-exceptional character of logic should be explained in terms that do not commit one to a kind of realism.[13]

In sum, methodological anti-exceptionalism and evidential anti-exceptionalism make the same assumptions about logic and science, and thus amount to similar views. While methodological anti-exceptionalism is committed to evidential anti-exceptionalism simply in virtue of the evidence needed to deploy the abductive methodology, evidential anti-exceptionalism is committed to methodological anti-exceptionalism via accepting the broad view of scientific realism (in terms of evidence and best explanation), and thus, for reasons similar to why scientific realists embrace the methodology[14] of abduction. Given the collapse of both kinds of epistemological anti-excepionalism into one, there is still a last possibility of accepting simply P10-P11, and call this epistemological anti-exceptionalism, while allowing for different theories of science to lead to different epistemological views for logic.

3. Science and the demarcation of logic

Last section argued that epistemological anti-exceptionalism, by making claims about scientific evidence and scientific method, is committed to a realist position, in particular scientific realism. In Hjortland & Martin's (2019) taxonomy, metaphysical anti-exceptionalism is presented as a commitment to logical theories being descriptions about logical facts, and presumably to some form of logical realism. As such, it will be argued that epistemological anti-exceptionalism is just one more type of metaphysical anti-exceptionalism.

Epistemological anti-exceptionalism, as was argued in the last section, is committed to a realist view in which logical validity is a fundamental aspect of a language and mind independent reality. The task of logic as a discipline is then to investigate and describe some aspect of the world, namely, facts about validity: "[t]he central notion of logic is validity, and its behaviour is the main concern of logical theories" (Priest 2016, p.39). While there remains disagreement both about the nature of validity and about what counts as a valid argument, that validity is a "phenomena that logical theories are trying to explain"(Hjortland & Martin 2019, slide 13) is shared a assumption of those who endorse epistemological anti-exceptionalism.

Moreover, epistemological anti-exceptionalism is clearly not metaphysically free, inasmuch as the claims of method, and of evidence, for anti-exceptionalism, both turn out to rest so far on realist assumptions. By endorsing the view of "logic as a science" and adopting the epistemology of scientific realism, the anti-exceptionalist commits to its ontology. In its ontological aspect, scientific realism can be characterized by the "belief in both observable and unobservable aspects of the world described by the

sciences" (Chakravartty 2017). Under the assumptions of both anti-exceptionalism and scientific realism, a kind of logical realism emerges, as one is encouraged to believe in the unobservable aspects of logical theories.

Accepting that epistemological anti-exceptionalism is committed to realism about the phenomena investigated by logical theories is not implausible. Two main proponents of epistemological anti-exceptionalism in Hjortland and Martins's taxonomy are Williamson and Priest, both having heavy logical realist undertones to their views.

> Williamson thinks of a logical theory as a theory of unrestricted generalizations. These generalizations are not specifically about properties of arguments, sentences, propositions; they are generalizations about absolutely all things in the world. (Hjortland 2017, p.5)

Priest gladly grants that "[t]he account of validity offered here is a realistic one" (Priest 2006, p.186). For him, however, no specific account of realism is endorsed:

> For, as I observed, the situations about which we reason are not all actual: many are purely hypothetical. And one must be a realist about these too. There are numerous different sorts of realism that one might endorse here, many of which are familiar from debates about the nature of possible worlds. One may take hypothetical situations to be concrete non-actual situations; abstract objects, like sets of propositions or combinations of actual components; real but non-existent objects. I will not address the question of which of these accounts is correct here. Any of them will do, as long as they provide for an independent realm of situations; and hence a determinate answer to the question of which theory is correct (even if our theories do tie, epistemically). (Priest 2006, p.207)

Moreover, independently of which realist account of logic one adheres to, "the question arises as to the criteria one should use to determine which theory is correct. The answer to this (. . .) is that one decides on the basis of which theory is overall simplest, most adequate to the data, least ad hoc, and so on" (Priest 2006, p.174). It seems then, at least in both cases, logical realism and scientific realism go hand in hand.

Mcsweeney (2018) characterizes a logical realist by, among other things, the belief that "I'm not sure what the world fundamentally consists in, but it has some structure and science is going to help figure out what that is" (Mcsweeney 2018, p.5). As previously noted, anti-exceptionalist has already been pointed out to share some assumptions of metaphysical logical realism. Following the argument presented here, the affinity of a kind of logical realism and anti-exceptionalism is wholly unsurprising.

What to make of the relations of epistemological anti-exceptionalism, logical realism and scientific realism? It seems that accepting validity as an unobservable aspect

of reality is an assumption prior to the demarcation of logic as a science, such that the demarcation of logic is only done in light of this realism. This runs counter to the taxonomy of anti-exceptionalist views proposed by Hjortland & Martin (2019), which proposes a more significant distinction between the metaphysical and episte-mological varieties. If accepting the current argument, this distinction does not hold up to scrutiny, as epistemological anti-exceptionalism is simply covert metaphysical anti-exceptionalism. Such metaphysics is provided by scientific realism.

In sum, no variety of anti-exceptionalism is metaphysically uncommitted. In the taxonomy presented by Hjortland & Martin (2019), too many assumptions are made about logic and science, such that the proposed distinctions collapse. Yet not all is lost. In the next and last section, distinct anti-exceptionalists views are delineated, making explicit what commitments are being taken with each view.

4. Conclusion

This essay has argued that methodological and evidentialanti-exceptionalism col-lapse into simply abductivism about logic, and that epistemological anti-exceptiona-lism is just one more kind of metaphysical anti-exceptionalism. Anti-exceptionalism is a very tempting view, which proposes to settle many issues within philosophy of logic. Yet it would be odd if diverging metaphysical views were all compatible with the same position, as if these previous commitments did not affect anti-exceptionalism. As such, the present article attempted to show some metaphysical assumptions of epistemological anti-exceptionalism. One would hope that anti-exceptionalism is not realism in disguise, and so this last section will discuss alternative epistemological approaches to science, so as to offer alternatives to abductivism (in particular anti-realist positions), and thus allow for more disagreement within anti-exceptionalism.

A main point to take notice is that there is no metaphysically free anti-exceptiona-lism. All anti-exceptionalist views are committed to some kind of metaphysics, and moreover, as all anti-exceptionalists views propose the revision of logic, they also all have a proposed epistemology of logic (although many do not claim that it is similar to that of science). As such, "metaphysical" and "epistemological" as labels for anti-exceptionalist views are not very descriptive. While the "metaphysical" kind of anti-exceptionalism can be simply called "anti-exceptionalism", a more informative label for the "epistemological" kind would indicate that the epistemology in question is akin to what is taken to be epistemology of science. The suggested taxonomy is thus:

Broad anti-exceptionalism

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...   Narrow anti-exceptionalism

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...   Abductivism in logic
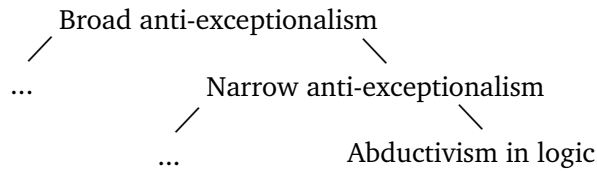
In this scheme, *broad anti-exceptionalism* is defined only by P1, while *narrow anti-exceptionalism* is defined by both P1 and P2. Abductivism in logic is specifically the view of P7-P10. This taxonomy leaves more room for diverging anti-exceptionalist views. Within anti-exceptionalists views more broadly, for example, one can find the varieties presented by Hjortland & Martin (2019), such as Maddy's (2002) and Williamson's (2017) "descriptivism of non-normative facts", but also a view such as Resnik's (2004) non-cognitivism about logic. These anti-exceptionalists do not rely on a particular relation between logic and science, but they do discuss how logical theories could be revised. Maddy does not propose a method of theory revision, citing that revising logic takes "more than observation and experiment; it would take a revision of our most basic ways of thinking" (Maddy 2002, p.78). Resnik proposes wide reflective equilibrium as a method of revision, akin to other normative disciplines (and not scientific ones). Also worth mentioning is Peregrin (2018), who argues that while logic is a science, it is a normative one, and it's normativity comes in two varieties (logic describes how we reason and also tells us how to do so), which plays a role in the process of revision, making it unlike other sciences.

What is more interesting, however, is to explore other views under narrow anti-exceptionalism besides abductivism. If the scientific realist account of science is replaced by different ones, new kinds of anti-exceptionalism can be proposed, based on, for example, on Kuhn or Lakatos' research programs, Feyerabend's "anarchism", Van Fraassen's constructive empiricism, or even instrumentalism. Each of these frameworks has its own account of what counts as evidence and of what (if anything) characterizes scientific progress. Some work has already been done in this direction. Tajer (ms) tries to fit logic within Kuhn's theory of science, and Read (2018), Priest & Thomason (2007) and Russell (2014) relate logic to Lakatos' theory of mathematics (and not particularly to his theory of the natural sciences).

In sum, in-as-much as anti-exceptionalism is about theory revision, it deals both in metaphysics as well as epistemology. Other than agreeing on the possibility of revising logical knowledge, anti-exceptionalists agree on not much else. There is no consensus on what knowledge is being revised, how this revision is done, and what kind of evidence prompts such revision. This new taxonomy of broad and narrow anti-exceptionalism is proposed as a better way to understand the differences between the views which can be deemed anti-exceptional about logic. It separates the views which are inspired by theories of science, without obscuring their metaphysical aspect, while

also encouraging a discussion of method for theory revision more broadly, instead of only in the context of logic's affinity with science.

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Notes

[1]It could be claimed, nonetheless, that logic as a kind of *a priori* knowledge can be revised on non-apriori grounds; See Russell (2017, sec.6) and Bonjour & Devitt (2014).

[2]Abduction is a mode of inference first proposed by C. S. Peirce, which together with deduction and induction, are the kinds of reasoning involved in scientific inquiry (Rodrigues 2011). In recent literature, however, this term has lost its original meaning and has come to be employed in the justification of theory selection, as "inference to the best explanation"; See Douven (2017).

[3]The mainstream view is that logical theories, if descriptive at all, describe only unobservables.

[4]This is a work in progress that has been presented during the conference "Anti-Exceptionalism and Pluralisms: from Logics to Mathematics" at the IUSS Pavia (Italy), as well as discussed in conversation.

[5]But could be relevant if the criteria indicated are too different from what would be expected in the natural sciences.

[6]This attribute is taken to be related sometimes to expressive power of the language and sometimes as deductive strength of the proof system.

[7]Using abduction in logic without guaranteeing that the evidence logic is explaining is of the "scientific" kind, seems to allow the selection of theories which can suggest the existence of unobservables "supernatural" entities.

[8]Ulf Hlobil remarks on the use of *a priori* evidence in logic that the "the apriOricity of logic constitutes a discontinuity with science" (Hlobil 2020, p.3).

[9]More on realism within anti-exceptionalism is discussed in Section 3 below.

[10]Contrary to this, Hjortland & Martin (2019) claim that Bertrand Russell, in "On scientific method in philosophy" in Mysticism and Logic (Doubleday Anchor Books, New York, 1957), advances a methodological anti-exceptionalist without being an evidential anti-exceptionalist.

[11]And one wonders if the same may also be done for philosophical theories more generally.

[12]While it has been proposed to me that abduction (in the sense of "inference to the best explanation") could be put forth independently of a scientific realist view, I have not found such accounts. While pragmatist views do rely on abduction in the sense of Peirce, this is not the same sense of scientific realists or anti-exceptionalists. See endnote 2 above.

[13]Alternatives to scientific realism are mentioned in Section 4 below.

[14]For arguments in support of abduction, see Chakravartty (2017) and Douven (2017).

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