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A Defense of Analogy Inference as *Sui generis*

Abstract. Accounts of analogical inference are usually categorized into four broad groups: abductive, deductive, inductive and *sui generis*. The purpose of this paper is to defend a *sui generis* model of analogical inference. It focuses on the *sui generis* account, as developed by Juthe [2005, 2009, 2015, 2016] and Botting's [2017] criticism of it. This paper uses the pragma-dialectical theory of argumentation as the methodological framework for analyzing and reconstructing argumentation. The paper has two main points. First, that Juthe's arguments against a deductive interpretation of *prima facie* analogy argumentation remain unaffected by Botting's criticism, which means that many of the reasons against deductive reformulation of analogy argumentation still stand. The additional argument, which Botting himself brings up, that a deductive interpretation cannot account for the cumulative effect of analogies, just provides further reason to reject deductivism. The second main point of this paper is that an inductive interpretation of analogical inference also fails. There are constitutional differences between inductive and analogical inference that cannot be bridged. The result is a firm defense of the *sui generis* view of analogical inference.

Keywords: analogical inference; *sui generis*; deductivism; interpretation; argumentation theory; argument schemes; pragma-dialectical; relevant similarity; universal claim; one-to-one correspondence; determining relation

1. Introduction

Is analogical inference in argumentation by analogy its own unique type of inference or can it be accounted for in terms of some other type of inference? Accounts of analogical inference have so far been categorized

into four broad groups: abductive, deductive, inductive and *sui generis*.[1]
Sui generis accounts are categorized by identifying something unique
about the inference that cannot be reduced to abductivist, deductivist,
or inductivist reconstruction. David Botting, being a deductivist, has in
several papers argued that all types of arguments — including arguments
by analogy — can be reduced to deductive arguments [Botting 2012a,b,
2014, 2016]. However, after reading Juthe's 2015 paper, Botting was
finally convinced that deductivism fails to account for complex argumen-
tation by analogy [Botting 2017]. In previous publications [Juthe 2005,
2009, 2015, 2016] Juthe has argued that analogy is a *sui generis* inference
not reducible to deductive inference (or any other type of inference).[2]

However, Botting thinks that, in Juthe's 2015 paper, all of Juthe's
explicit arguments to reject deductivism and accept a *sui generis* ac-
count of analogy fail, but that there remains an implicit argument that
does provide a good reason to reject a deductivistic account of ana-
logical inference. The implicit argument is that a deductivist analysis
cannot explain why adding *further* analogues or similarities seems to
have a cumulative force on the inference, which they would not have in
a deductivist account. However, Botting argues that this is insufficient
to accept the *sui generis* account, because compared to the *sui generis*
account, his inductive confirmation-theoretic analysis [2012a] provides a
better account of all the features of complex analogy argumentation.[3]
According to Botting, five considerations provide important clues when

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[1] It should be noted that the abductive accounts never concern so-called *a pri-
ori* analogies. A priori analogies are comparisons where the analogue lacks empiri-
cal content, making them more like thought-experiments, or hypothetical in nature.
This classical typology of contrasting inferences is challenged by the typology of the
pragma-dialectical typology with three types of argument schemes: the symptomatic
scheme, the causal scheme and the analogy scheme [van Eemeren and Grootendorst
1992, pp. 92–99]; [van Eemeren et al. 2002, pp. 95–102]. The pragma-dialectical
typology cuts across the classical typology (i.e., some inductive arguments employ a
symptomatic scheme, some a causal scheme, and vice versa).

[2] It is true that, as Botting points out, Juthe does not attempt to refute the
claim that analogy argumentation can be reduced to inductive arguments. However,
besides arguing against the possibility of reducing argument by analogy to deductive
argument, he explicitly argue that the analogy scheme cannot be reduced to the
symptomatic or causal scheme (i.e., schemes that overlap the inductive scheme to a
large extent).

[3] Botting's paper also briefly discusses Guarini's *sui generis* account, as compared
to Waller's deductivist account, but since almost all of Botting's paper focuses on
Juthe's *sui generis* account of analogy I will limit my discussion to this.

assessing analogical inference in comparison to other types of inferences [Botting 2017, p. 3]:

(I) Does the argument ineliminably refer to the analogue/source/ comparison?

(II) Does the argument ineliminably refer to a universal claim?

(III) Is the inference defeasible?

(IV) Is the inference *a priori*?

(V) Is the inference one that can vary in strength in the appropriate ways?

I think Botting is correct to say that these clues are important. With respect to (I): there are some analogies that perform a purely heuristic role and make no real contribution to the inference. Once we have the universal claim that subsumes the target and the source, the target follows by formal validity from the universal claim without any contribution from the analogue; once we know why and how the target and the source (the analogue) are analogous, the comparison itself plays no role in the argument. If this is true for all analogy argumentation then there is no genuine analogical inference, just deductive arguments and deductive inferences that have the appearance of being analogical.

I will here, however, argue that all the clues that Botting himself suggest in fact support that the *sui generis* view is the accurate one. I argue that Botting — apart from the insight that the cumulative force of added analogues does (also) refute deductivism — is wrong on all points: Juthe's arguments against deductivism do not fail; the *sui generis* model is not reducible to deductivism (even if neglecting the cumulative force of added analogues), and Botting's inductive confirmation-theoretic analysis is no better at accounting for the peculiarities of complex analogy argumentation than the *sui generis* account.[4] The result is a firm defense of the *sui generis* view of analogical inference.

The structure of this paper is as follows. In Section 2 I provide a methodological background for the discussion; Section 3 criticizes Botting's defense of deductivism against Juthe's counterarguments; in Section 4 I discuss Botting's understanding of how the cumulative force of

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[4] This should not be taken to mean that Botting's paper is without merit or value. On the contrary, his critique, even though it may fail, demands that proponents of the *sui generis* view better clarify their position and provide additional arguments for their view. Thus, based on Botting's challenging arguments, I develop a defense of Juthe's previous point, ultimately strengthening the *sui generis* account of analogy.

added analogies refutes deductivism, and I criticize Botting's claim that his inductive conformation-theoretical model can account for complex argumentation by analogy better than the *sui generis* account.

2. The background for the discussion

2.1. Argumentation theory

I will here provide a brief background for readers who may not be familiar with the pragma-dialectical theory of argumentation. What complicates the issue is that this discussion of analogical inference takes place in an intersection between "competing frameworks of argumentation theory"—the pragma-dialectical framework, which has a *process* view of argumentation, and the framework that views the "argument as a product", which not only includes contrasting disciplinary perspectives but also different terminology. The product view of argumentation considers an argument as a "finished product", while the process view takes into account the process from which the argumentation arises. The product view disregards the process that resulted in the argumentation. This view generally disregards all contextual and pragmatic factors in which the argumentation is embedded. In a pragma-dialectical framework, on the other hand, an argumentation is considered not just as a set of premises standing in logical relation to a conclusion, but a complex speech act advanced to solve a difference of opinion based on the merits of the arguments advanced within it. The pragma-dialectical theory of argumentation was founded and developed by Frans van Eemeren and Rob Grootendorst [van Eemeren et al. 2009; van Eemeren and Grootendorst 1984, 1992, 2004; van Eemeren et al. 2002]. This framework takes into account a much broader perspective which, besides logical structure, is sensitive also to verbal, contextual, situational, and other pragmatic factors that affect the outcome of an argumentative exchange. Its definition of argumentation is: "a verbal, social, and rational activity aimed at convincing a reasonable critic of the acceptability of a standpoint by putting forward a constellation of propositions justifying or refuting the proposition expressed in the standpoint" [van Eemeren and Grootendorst 2004, p. 1]. The pragma-dialectical analysis of argumentation takes place in a frame of an "ideal critical discussion", which consists of certain analytically distinguishable stages regulated by norms, where a protagonist asserts a standpoint against which an antagonist expresses

doubts or other critical reactions (objections, counterarguments, etc.) to which the protagonist, in turn, advances the argumentative speech act to overcome these critical reactions [van Eemeren et al. 2009; van Eemeren and Grootendorst 1984, 1992, 2004; van Eemeren et al. 2002].

In this paper I will employ the pragma-dialectical framework when analyzing and reconstructing argumentation because I think it superior to the alternatives. In the pragma-dialectical system (hereafter PD) the terms "argumentation" and "argument" are used in the sense manifested in most Romance and Germanic languages. "Argumentation" refers to the constellation of propositions employed in support of — and not including — a standpoint, whereas "argument" corresponds to a single *reason*. Thus, a single argumentation — which is the smallest argumentative unit in pragma-dialectics — consists (usually) of two propositions: the *argument*, which is advanced as a reason for the standpoint, and *the linking premise* (*often unexpressed*), which enables the argument to be a reason for the standpoint. Thus, the term *argumentation* contains the integral constellation of arguments advanced in defense of a standpoint. Every single argumentation instantiates an *argument scheme*, which enables the argument to be a reason for the standpoint; an argument scheme is the inference configuration of the particular inferential principle expressed by the linking premise. The reconstruction of argumentation is retrogressive, starting with the standpoint and followed by the arguments, which means that a single argumentation looks like this [van Eemeren et al. 2002, pp. 96–98]:

	1.	Jack is an experienced teacher
because:	1.1	He hardly spends any time on preparation
and:	(1.1′	Little time spent on preparation is symptomatic of experienced teachers)

The parentheses mark the proposition that operates as the linking premise, often unexpressed. This single argumentation employs the symptomatic argument scheme which means that its inferential principle has a symptomatic relation:

	1.	Y is true of X	[Standpoint]
because:	1.1	Z is true of X	[Argument]
and:	(1.1′	Z is symptomatic of Y)	[Linking premise]

An argumentation can be single argumentation consisting of only one argument (and its linking premise) or elaborate and complex, consisting of many arguments (each with its own connected linking premise). There

are three types of schemes and they characterize three different types of
argumentation: the symptomatic scheme, the causal scheme, and the
analogy scheme.[5] Each type of argument scheme has its own unique set
of critical questions, which is a kind of evaluation test of whether the
scheme has been appropriate and correctly applied [van Eemeren et al.
2002, pp. 91–102, 131], [van Eemeren and Grootendorst 2004, pp. 14, 21,
121–122]. These questions pose potential challenges to the argumenta-
tion and pinpoint possible targets for counterarguments. For instance,
the critical questions associated with the symptomatic scheme are: (1)
Aren't there also other non-Y's that have Z?; and (2) Aren't there also
other Y's that do not have Z? [van Eemeren et al. 2002, p. 98]. If the
critical questions that match the underlying scheme of an argumentation
can be satisfactorily answered then the argument scheme rule — which
is one of the normative rules of the critical discussion — has been fol-
lowed and the antagonist should accept the argument as an acceptable
reason for the standpoint.[6] In the PD framework the logical structure
and formal validity is only one part, alongside dialectical, dialogical,
and pragmatic issues. The exact relation between formal validity and
argument schemes is a controversial and ongoing issue which cannot be
dealt with here.[7] The analogy scheme that this paper focuses on has the
following configuration in the standard PD account [van Eemeren et al.
2002, p. 99]:

	1.	Y is true of X	[Standpoint]
because:	1.1.	Y is true of Z	[Argument]
and:	(1.1′	Z is comparable to X)	[Linking premise]

The *sui generis* analogy scheme that Botting reacts against can be
viewed as an elaborated development of the standard analogy scheme

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[5] This does not mean that I necessarily accept that there are only three types of
argument schemes; the above serves only to explain the standard account of the PD
system. Indeed, I hold there to be more than three categories of argument schemes
but certainly fewer than theorists in the informal logic movement (see for instance
[Walton et al. 2008], which identify a total of 96 different argument schemes). From
a PD perspective these are just subschemes of the three main types.

[6] To be precise, the argument scheme rule states 'Standpoints may not be re-
garded as conclusively defended by argumentation that is not presented as based on
formally conclusive reasoning if the defense does not take place by means of appro-
priate argument schemes that are applied correctly' [van Eemeren et al. 2009, p. 23].

[7] This is an issue within argumentation theory as such, and not only within the
PD system. This author will deal with this in a future paper.

in the PD theory of argumentation.[8] This elaborated version will be discussed in more detail in Section 2.2.

In the PD system, all types of complex argumentation are constructed out of a combination of single argumentations, each instantiating one of the three types of argument schemes. Complex argumentation can be complex in three basic ways: *multiple* argumentation consists of more than one separately sufficient alternative defense (i.e., 1.1; 1.2; 1.3; etc.) of the same standpoint; *subordinatively compound* argumentation consists of a chain of arguments in which each argument supports the preceding argument up to the standpoint (i.e., 1.1; 1.1.1; 1.1.1.1; etc.). Finally, *coordinatively compound* argumentation consists of several single argumentations that coordinatively cooperate in order to constitute a sufficient defense for the standpoint (i.e., 1.1a; 1.1b; 1.1c; etc.). These three basic types of complex argumentation structures may be endlessly combined, which makes the level of complexity theoretically unlimited (i.e., 1.1.2a; 1.1.2a.1; 1.3.1c; etc.) yet they still provide a simple way to display what each argument is supporting in the argumentation as a whole.[9] For instance, a complex argumentation could look like this:[10]

| 1.	I am not very satisfied with this book	[standpoint]
1.1	The price is too high	[first argument for 1.]
1.2a	The French language makes it less accessible	[second argument which work coordinatively with 1.2b]
1.2a.1	Most people know English, while not many know French	[a subordinative argument for 1.2a]
1.2b	A good book should be accessible to as large an audience as possible	[works coordinatively with 1.2a to constitute a sufficient reason]
1.3	I was not allowed to work on it	[third independently sufficient argument for 1.]

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[8] To be exact, I had already developed the analogy scheme before getting versed in the PD theory of argumentation [Juthe 2005, 2009]. However, after acquiring knowledge of the PD system he integrated and further developed the scheme to fit into the PD system.

[9] The linking premise for each argument is usually left out unless it is relevant for the evaluation.

[10] The example is taken from [van Eemeren et al. 2002, p. 76] (with some slight modification).

1.3.1   Only native French speakers   [first subordinative argument
          were allowed to work on it   for 1.3]

which would visually look like this:
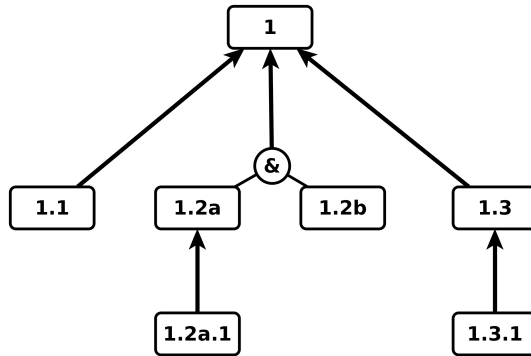
Neither the North American terminology nor the informal logic movement has "argumentation structures". Instead, they have structures of "premise sets" — a concept based on the *logical* relations between the premises and the conclusion within an argument ("argument" here refers to the whole nexus of premises and conclusion). The North American sense of "argument" can have linked, convergent, or serial premise structures. It has a serial premise structure if each premise logically supports the acceptability of the next premise, and so on until reaching the conclusion [Walton 1996, p. 89], [Walton 2005, pp. 146–147], [Freeman 2011, pp. 3–13, 55]. An argument has a convergent premise structure if the premises are independently relevant to the conclusion [Walton 1996, p. 87], [Walton 2005, pp. 139–145], [Vorobej 2006, pp. 172–173], [Govier 2010, pp. 38–39], and an argument has a linked premise structure if the premises are not independently relevant to the conclusion [Govier 2010, pp. 37–39], [Walton 1996, p. 85], [Walton 2005, pp 141–145], [Vorobej 2006, pp. 224–239], [Freeman 2011, p. ix, ff.]. A linked premise set must be taken together to constitute a relevant support for the conclusion.

This difference in theoretical and conceptual framework means that, in the PD system, the argumentation structure is based on the *dialectical function* of various single argumentations, while the premise structure refers to the *logical relations* in an argument (in North America this is the "argument"). Thus, complex argumentation in the PD system is

always composed of a number of single argumentations combined not by their logical relations but by their dialectical function in the critical discussion.[11] From a North American perspective, each of these single argumentations would have a linked premise set, but the concepts of "serial" and "convergent" could not apply to premises but rather to each single argumentation. For instance, each single argumentation in a co-ordinatively compound argumentation could have a logically convergent relation to the standpoint but the nexus within each single argumentation would always be a linked premise set.

The "product view" in combination with *deductivism* — the view that arguments should be interpreted as intended to be *formally* valid deductive arguments and that the only good arguments are formally valid arguments — is the widespread implicit framework in philosophy unconnected with the informal logic movement or argumentation theory in general. Deductivism argues that all, most, or many *prima facie* non-deductive types — abductive, inductive, analogy, and presumptive arguments etc. — should, when properly analyzed, be reducible to deductive arguments, and a "deductivist" is the proponent of this view.[12] There is of course much more to argumentation theory in general and to the PD theory of argumentation[13] in particular, but the above should provide enough background to follow the discussion of this paper.[14]

2.2. The *sui generis* model for analogical inference

In this section I summarize Juthe's *sui generis* model for analogical inference, which is intended to be analyzed within the framework of the

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[11] However, they may be viewed as composed by dialogical logic, where logical relations are analyzed in terms of a dialectical exchange.

[12] Many "deductivists" accept inductive inferences as valid, working alongside deductive inference. Some even accept abductive reasoning and analogy as inferences.

[13] For more information on the PD theory of argumentation see [van Eemeren 2010; van Eemeren et al. 2009; van Eemeren and Grootendorst 1984, 1992, 2004; van Eemeren et al. 2002].

[14] It should be observed that while Botting can be characterized as a deductivist, he accepts the distinction between the macrostructure and the microstructure of argumentation; that is, that argumentation is often not a single inference but composed of a number of smaller units of arguments. This is an advantage because the most implausible version of deductivism is that which views all instances of argumentation as one single deductive argument with one single inference. Whether Botting holds a product or a process view of argumentation remains an open question.

pragma-dialectical theory of argumentation (even though it can be used in other contexts as well). The basic notion of argumentation by analogy is that it is a type of reasoning that appeals to similarities between two objects, to support the conclusion that there exists some further similarity.[15] Two objects are comparable in one respect and therefore also comparable in a further respect. Juthe provides the following account of the *sui generis* analogy scheme [Juthe 2005, 2009, 2015, 2016]:

	1.	The Target-Subject (TS) has the Assigned-Predicate (AP)
because:	1.1	The Element($_\in$) of the Analogue (A) determines the Assigned-Predicate (AP) of Analogue (A)
and:	1.1′	The Element ($_\in$) of the Analogue (A) corresponds one-to-one with Element ($_{\in^*}$) of the Target-Subject (TS)[16]

According to this *sui generis* analysis, a single argumentation by analogy always consists of four basic parts and two crucial relations. The subject of the standpoint of an argumentation by analogy is labeled Target-Subject (TS) and what is said *about* that subject is the Assigned-Predicate (AP). The object with which the Target-Subject (TS) is compared, which appears in the linking premise as well as in the argument, is the Analgoue (A). Thus, the Assigned-Predicate (AP) is the predicate that is "transferred" — assigned — *mutatis mutandis* to the Target-Subject (TS) from the Analogue (A) (i.e., the AP of the Analogue becomes AP^* of the TS). The similarity that *connects* the TS with the A with respect to the AP is analyzed as a one-to-one correspondence between an $Element_\in$ of the A to a counterpart $Element_{\in^*}$ in the TS. The one-to-one correspondence between $\in$ and $\in^*$ is *relevant* for the function of assigning the AP as a new predicate AP^*, *mutatis mutandis*, to the TS, if the possession of element $\in$ in the A is part of the determination of the AP in the A. Thus, the fact that there is a one-to-one corresponding $\in^*$ in the TS ensures that the same determining relation

can be assigned between $\in^*$ and a corresponding AP^* that we may now claim for the *TS*. Thus, the comparison can be reduced to a sameness of relations between elements in two contrasting objects. The one-to-one mapping correspondence may obtain between any type of element — or different types of elements for that matter — as long as the $\in$ in the A has a counterpart $\in^*$ in the *TS* which is part of the determination of AP. It is important to stress that the determining relation between $\in$ and AP "can be any type of relation (including probable, causal, epistemic, normative, evaluative, resultant or supervenient)" [Juthe 2005, p. 10].

The analysis of relevant similarity as an element mapping one-to-one to an element in another domain is important. It means that a comparison is not based simply on a first-level similarity between an Analogue and the Target-Subject, as a one-to-one correspondence may obtain between *different* elements. For instance, a Porsche and a Chevrolet can be similar with respect to speed, even though what makes the Porsche fast is its aerodynamic shape, while the high speed of the Chevrolet is primarily due to a strong engine. In this case, then, the element "strong engine" would correspond one-to-one with the element "aerodynamic shape". The elements are different, yet because they still map onto each other in a one-to-one correspondence, the assigned-predicate "reach high speed" can still be transferred from the Chevrolet and assigned to the Porsche [Juthe 2016, pp. 107–108]. Even though the concept of relevance may not be completely eliminated from an analysis of analogical inference, having relevant similarity is interpreted as a "determining relation", which can lead to a more precise understanding of analogical inference without putting too strong an emphasis on the ambiguous concept of relevance.[17] Figure 1 shows a graph of analogical inference.

Depending on how the relations would be displayed in a graph like the one above, Juthe sometimes label the determining relation the "vertical relation" and the one-to-one correspondence the "horizontal relation".

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[17] The idea of determination is taken from [Davies 1988]. Note that Juthe's analysis of relevance is not a *reductive* analysis, where relevance as such is reduced to determination, but rather a *summary* analysis, which is non-reductive and focuses on one content — determination — in the rich concept of relevance relevant for understanding analogy. Any account of inference by analogy must have an account of what it means that the similarities between the analogues are relevant or not. Furthermore, both the similarity and the relevance of the similarity must be true for the analogy to be cogent, therefore a scheme should express these as different premises even though relevant similarity cannot be separated into ontologically independent predicates. Without the analysis of relevant similarity, the scheme would be:
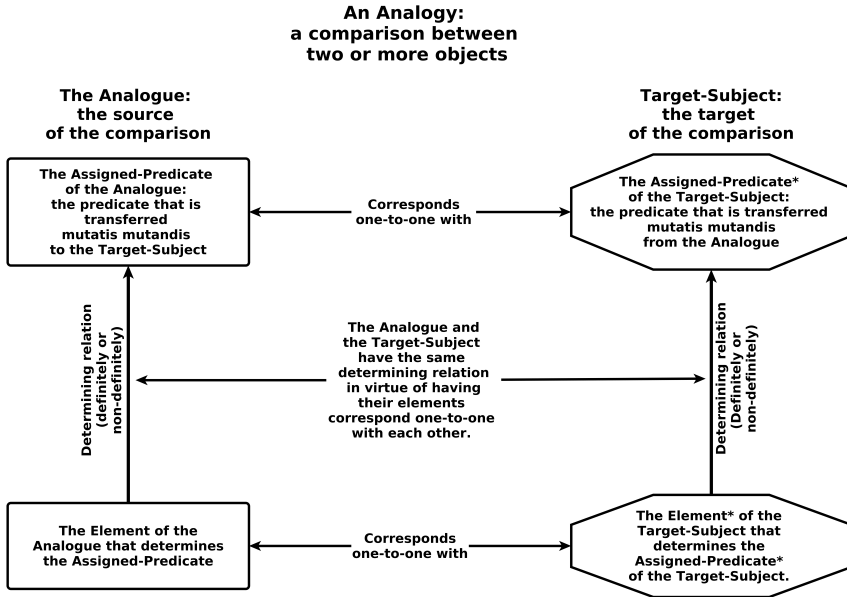
Figure 1.

But is there any reason to accept this analysis of analogical inference? Katharina Stevens [2018, p. 9–10][18] states:

> Any account of argument by analogy has to face the problem of how those evaluating such an argument can determine whether the similar-

1.   The Target-Subject has the Assigned-Predicate

1.1   The Element of the Analogue is relevant [i.e. is a reason] for the Analogue's Assigned-Predicate

(1.1′   The Analogue is similar to the Target-Subject with respect to the Element)

Sometimes the 'linking premise' and the 'argument' changed place so that the linking premise is advanced as the explicit item and vice versa. It depends on the context: if it is the comparison in itself that is most controversial then it will be advanced as the explicit argument; if it is the relevance of the element or the fact that the element is true of the Analogue that is most controversial, then it is this that will be advanced as the explicit argument of the argumentation and the other as the unexpressed premise.

[18] The paper has yet only been published online so the page number refers to the online version. Holoyak and Thagard propose a multi-constraint model of analogical reasoning [see, e.g., Holyoak and Thagard 1989, 1994]. According to this theory, analogical reasoning works through so-called analogical mapping. Mapping is the establishment of correspondences between elements of the objects of comparison.

ities between the analogues are relevant or not. In his oft-cited paper "Argument by Analogy", Andre Juthe proposes an elegant solution to this problem (Juthe 2005). Say that a similarity between a source-analogue and a target-analogue in an analogy consists of an element e of the source analogue and an equivalent element e* of the target analogue. An argument by analogy supports the claim that there is a further similarity between the analogues. This further similarity is between a known element s in the source analogue and an equivalent element s* that we may now claim for the target analogue [. . .]. A similarity based on e and e* is relevant for the argument if the possession of element e in the source analogue is part of the determination of the element s in the source analogue [. . .]. Juthe's analysis of what makes a similarity relevant in arguments by analogy has many advantages. For example, it is simple, straight-forward and intuitively plausible. I think another major advantage is that it fits well with the still dominant account of analogical reasoning as it has been proposed in the cognitive sciences by theorists like Holoyak and Thagard.

In addition, the analysis has the advantage that it does not reduce analogy to a simple rigid predicate calculus, since it focuses on comparing the "essence", or gist, in the objects of comparison [Juthe 2016, pp. 107–120].[19] The scheme appears to be able to handle comparison between complicated and complex cases which other analogy schemes cannot adequately deal with [Juthe 2016, pp. 113–120]. Further, it has the advantage that the scheme need not make any distinction in reconstructing "*a priori*" or "inductive" analogies: both can be reconstructed in the same type of scheme. It is furthermore fully compatible with the

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[19] Juthe was in this respect inspired by Hofstadter's critical review of Holyoak and Thagard's comprehensive work on analogy [Holyoak and Thagard 1994] where Hofstadter emphasizes that creating analogies is all about "gist extraction, the ability to see to the core of the matter" [Hofstadter 1995, p. 75]. Juthe, however, differs from Hofstadter in that he hold that the element in the determining relation of the Analogue is *that which constitutes the gist*; they are the *elements of which the essence is 'constituted'*. Each single argumentation adds one of the elements that constitute the gist in a comparison involving many similarities. If each element corresponds one-to-one with a counterpart element in another Target-Subject, then these counterpart elements will constitute the *same gist* in the Target-Subject, and they are *therefore* analogous. Another difference is that Hofstadter claims that analogy *only* resides in your mind, and in a sense is he right. However, in another sense, he is wrong. A deductive inference occurs in the *mind* for sure, but it cannot be a sound inference unless it is *true* that, say, "All humans are mortal" etc. Likewise, an analogy cannot be a correct analogy unless the similarity and its relevance obtain in reality [see Juthe 2016, pp. 118–120].

pragma-dialectical account of complex argumentation structures [Juthe 2015, pp. 428–436] because a complex analogy argumentation with many relevant similarities is simply composed of *many* 'single argumentations', each instantiating this scheme.[20] This means that it also allows for degrees in analogical strength. Finally, this *sui generis* account appears to be a genuine type of unique inference that does not employ any universal claim that makes it liable to reduction to deductive inference. This does not mean that this account of analogical inference cannot turn out to be seriously flawed. The question is whether or not Botting has shown that, on a deeper analysis, this account is, despite its advantages, severely defective and/or reducible to some other kind of inference. In what follows I will argue that we have no good reason to reject the *sui generis* model, but that we do have good reasons to accept it.

3. The arguments against a deductivist interpretation of argumentation by analogy

Juthe's reasons against deductivism and in favour of the *sui generis* view of argumentation by analogy has consisted of two *main* lines of reasoning Juthe [2005, pp. 18–21], [2009, pp. 151–158], [2015]. First, that argumentation by analogy works without commitment to any universal proposition operating as a gap-filling premise in the inference. Second, that deductive reconstructions of paradigmatic examples of argumentation by analogy cannot be completed without maintaining a reference to analogy. Juthe provide examples of arguments which cannot be recast in a deductive mode without incorporation of an analogical claim Juthe [2005, pp. 7–8, 11–14], [2009, pp. 151–158], [2015].[21] He also argues against the very possibility or plausibility of a universal premise operating as the linking premise in the inference. This would concern clue (I) (i.e., does the argument ineliminably refer to the analogue/source/comparison?) and clue (II) (does the argument ineliminably refer to a universal claim?). These arguments against deductive reinterpretations are very similar to those advanced by other defenders of the *sui generis* model of anal-

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[20] Juthe distinguishes between *mono* complex argumentation, which consists of many single arguments instantiating the same type of scheme, and *blended* complex argumentation, which consists of many single arguments instantiating different types of schemes [Juthe 2016, p. 257, f. 258.].

[21] One of these examples will be discussed in Section 3.3.

ogy [Govier 2011, 2002; Guarini 2004]. However, while accepting the truth and relevance of these arguments, Botting asserts that they are *insufficient* because at most they refute deductivistic *eliminativism*, not deductivistic *reductionism* [Botting 2017, pp. 3, 7, 12, 16–17, 19, 27]. I will address this in Section 3.1.

3.1. Eliminativism versus reductionism

Botting makes a distinction between eliminativist and reductionist versions of deductivism and argues that:

> [. . .] an argument may ineliminably refer to the analogue and still be deductive. I call this reductionism. To be an eliminativist about a priori analogies is not the same as being a reductionist; one can claim that a priori analogies can be reduced to deductive arguments yet, because the analogue does play an ineliminable inferential role, these a priori analogies are genuine arguments and the analogies themselves not simply heuristic. In short, deductivism (in the form of eliminativism) follows if the argument does not ineliminably refer to the analogue, but nothing much follows if it does ineliminably refer to the analogue, for reductionist, inductivist, and *sui generis* accounts may all refer to the analogue and give it a real inferential role to play.
>
> [Botting 2017, p. 3]

Botting uses this reasoning throughout the paper and asserts that Juthe's arguments thus fail to refute the reductionist version of deductivism. This argumentation can be reconstructed as follows:[22]

Reconstruction A [Botting's argumentation for the insufficiency of the inelimination of analogy]

1.   That a deductive recasting of analogy argumentation cannot eliminate the analogy is an insufficient reason against deductivism

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[22] This reconstruction is not only based on the quote passage but on an overall assessment of this argument in Botting's paper. Unless they are clearly inductive, I will always reconstruct Botting's argumentation as composed of deductive arguments regardless of whether I think that it is an accurate reconstruction or not, in order not to beg the question against his position by imposing a theoretical framework that he rejects. If this makes his arguments more easily refutable (which I think it does) so much the worse for his position.

1.1   Ineliminability of the analogy is only a reason against elimi-
nativism, and not against the reductionist variant of deduc-
tivism

(1.1′   Reductionism is a plausible alternative account of deduc-
tivism.)

1.1.1   Arguments by analogy do ineliminatively refer to the analogy
even in their deductive reformulation

1.1.1′   If an argument inleminatively refers to x then x plays an in-
ferential role in the argument[23]

However, there are at least three problems with this argumentation.
First, Botting neither justifies linking premise 1.1′ nor 1.1.1′ — they are
somehow taken for granted. The reason Botting takes 1.1.1′ for granted
is probably because he (wrongly) thinks that it is assumed in Juthe's
argumentation against deductivism. Secondly, as we shall see, there are
also positive reasons *against* 1.1.1′. Botting thinks that Waller's 'deduc-
tive analogy' is proof that an argumentation can have a formally valid
form while also making an ineliminable reference to analogy [Botting
2017, pp. 5–9]. According to [Waller 2001, p. 201] 'deductive arguments
by analogy' have the following form:

1.   We both agree with case a
2.   The most plausible reason for believing a is the acceptance of
principle C
3. C implies b (b is a case that fits under principle C)
4.   Therefore, consistency requires the acceptance of b

Guarini has criticized Waller's attempt to reduce analogical reasoning
to deductive inference and argues that Waller's scheme is in fact com-
posed of two subschemes, in that there is a non-deductive inference link
between 1 and 2 [Guarini 2004, pp. 160, 167, f. 2.]. Fabio Shecaira
accepts Guarini's criticism but defends Waller's scheme [Shecaira 2013].
Shecaira holds that Waller's scheme is in fact composed of two schemes,
one of which is deductive and the other abductive [Shecaira 2013]. How-
ever, Botting argues that both Guarini and Shecaira are wrong in think-

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[23] Botting never explicitly mentions the linking premise 1.1.1′ but given 1.1.1 and
his commitment to deductivism and to the logical minimum (the logical minimum is
the associated conditional to the explicit premises of an argumentation) it appears
that he must be committed to 1.1.1′ as the linking premise for 1.1.1. Thus, if 1.1.1′
is false then 1.1.1 fails to be a reason for 1.1. The same holds for 1.1′ with respect to
1.1.; the latter fails to be a reason for 1. without 1.1′.

ing that this inference is composed of two sub-inferences [Botting 2017, pp. 6–9] and that it should be taken as one unified inference. I think Botting is correct insofar as Waller's scheme is one unified single inferential scheme. In this context Botting [2017, p. 6] asserts about Waller's scheme that:

> [. . .] it is not enough to reject deductivism simply to show that the comparison forms a necessary part of the inference and is ineliminable from the argument, since Waller's argument also ineliminably refers to the analogue a in both [premises 1 and 2] it is analogical in virtue of its content (i.e., because it contains an ineliminable reference to an analogy) and deductive in virtue of its form.

This, however, is not correct. Waller's scheme does *not* refer to a *comparison* between case a and case b *in order to reach* the conclusion, neither does it *need* any such comparison. Botting has anticipated this objection and argues that although Waller's scheme does not explicitly have a comparison claim between a and b as a premise, it is "obvious that the inference goes through on the grounds that a and b are both implied by C, and this makes them analogous to each other" [Botting 2017, p. 6, f. 3]. However, this reveals a misunderstanding of what it means that something is the inferential principle of an argument scheme. If x is the inferential principle in argument scheme y, then it means that the inference in scheme y is *enabled by x*. To say that y *implicates x* is not enough. Thus, in an analogical inference, the inference is supposed to be enabled *by* the analogy; the analogy is *ex hypothesi* the *operating agent of the inference* and not just an *implication* of it. Any inference entails an almost infinite amount of truths, without being the operating inferential principle. For instance, the deductive syllogism:

1. Socrates and Plato are human
2. All humans are mortal
3. Therefore, Socrates and Plato are both mortal

also entails that Socrates and Plato are comparable with respect to humanity and mortality, but does that mean that this is an analogical inference? If two cases, a and b, *can* both be subsumed under a general principle then it follows that they are comparable with respect to this principle. Such a trivial fact does not, however, make the comparison an *operating agent* of the inference; it is not the inferential principle enabling the inference. In Waller's scheme it is the acceptance of the

general principle C that enables the inference — you only need judging that falls under C, and this can be done *without* comparing a and b. Comparison is inactive as the efficient operator in the inference. It is misleading to state that an argument is "deductive with respect to its form" and "analogical with respect to its content" if the latter plays no operating role as the inferential principle. Hence, Botting's very example of an allegedly 'reductive' reference to analogy in deductive inference is *de facto* an example where analogy *is* eliminated completely. An ineliminative reference to analogy as such gets us nowhere: *all* deductive arguments make ineliminable reference to various material aspects of the premises of the argument in question. Take, for instance, the following deductive argument:

1. This fruit is a banana
2. If a fruit is a banana then it is healthy
3. This fruit is healthy

The argument makes an ineliminable reference to *bananas* — you cannot take away *bananas* and still reach the conclusion — but no one would therefore suggest that it is an "argument by bananas" and assert that it is a special kind of argumentation with its own unique type of inference. If Botting and other deductivists, on the other hand, were to assert that you *can* take away the reference to bananas/fruit in this "argument by bananas" e.g. by increasing the abstraction and replace them with undetermined x and/or y, then Waller's so-called "deductive analogy" meets with the same fate. The pure logical structure of *any* argument can be attained by just *increasing the level of abstraction*. The "argument by bananas" abstracted into its "pure logical form"[24] has the following logical structure:

1. $a \rightarrow b$ [this x is a y]
2. $(a \rightarrow b) \rightarrow c$ [If x is y then it is c]
3. $a \rightarrow c$ [this x is c]

and is an instance of *modus ponens*. However, the same can be applied to Waller's scheme, which can be said to have the following logical structure:

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[24] I deny that there is any real pure form, and this abstracted form is still an argument: it is an argument that a is c, with the reference to "bananas" abstracted.

1. a
2. $a \rightarrow C$ [if you accept a then you should accept that it is C that
        makes a credible]
3. $C \rightarrow b$ [If C then b]
---
4. b

and it is also an instance of *modus ponens* (with two conditionals).
Hence, it is valid by its logical form alone (at this level of abstraction) and
the reference to analogy is as redundant as the reference to bananas in
the "argument by bananas". Thus, the linking premise 1.1.1′ in Botting's
argumentation is false, and the fact that there is an ineliminative refer-
ence to some material aspects is no reason to believe that the inelimina-
tive element *operates as the inferential principle* in the inference. Thus,
Botting's argument commits the fallacy of equivocation: the analogy is
indeed ineliminative in the sense that eliminating it changes the *kind*
of inference, but it is not ineliminative in the sense that, without it, no
inference can be made whatsoever. Hence, Botting is involved in a sleight
of hand in that he is supposed to show that analogy is ineliminative as
an inferential principle but he shows only that certain material content
is ineliminative in a deductive inference regardless of what function that
material content may serve in the inference. An anticipated objection
from the deductivist advocate is that, if this is true, then it would target
Juthe's counterarguments against deductivism as well. Cannot Juthe's
main argumentation be summarized as follows?

1. If an argument ineliminatively refers to x then it may play an
        inferential role in the argument
2. Deductive reformulation of analogy argumentation ineliminia-
        tively refers to the analogy
---
3. Therefore, analogy — not formal validity — is the active inferen-
        tial principle role in the argument

But this is not Juthe's argument. It does not assume that ineliminative
content *per se* makes it part of the *inferential principle* that enables
the inference. The argument is rather that the ineliminativeness of the
analogy is *one* sign — one piece of evidence — that is part of a complex
so-called cumulative coordinatively compound argumentation with many
cooperating arguments that *together* accumulatively provide quite a con-
vincing defense for the standpoint.[25]

[25] This   reconstruction   is   based   on   an   overall   assessment   of   Juthe's

Reconstruction B [Juthe's overall argumentation for the *sui generis* of analogy argumentation]

1.	Analogy, rather than formal validity, is the inferential principle that plays the crucial inferential role in analogy argumentation
1.1a	Analogy plays the inferential role in the non-deductive formulation of analogy argumentation
(1.1a′	That analogy plays the inferential role in the non-deductive formulation is a sign that it is the real active inferential principle in the inference of analogy argumentation)
1.1b	The universal premise necessary to make an analogy argumentation into a deductive argument cannot be supplied (and if it is supplied it makes the argumentation much worse as an argument and does no justice to the intuitions of the argumentation pre-reconstruction).
(1.1b′	That it is impossible to supply the universal premise necessary to reformulate an analogy argumentation into a formally valid deductive a argument is a sign that such a reformulation is false.)
1.1c	A deductive reformulation of analogy argumentation must still ineliminably refer to the analogy
(1.1c′	That deductive reformulation must make ineliminable reference to the element which has the inferential role in the non-deductive formulation is a (further) sign that it is the real operating inferential principle)
1.1d	Analogy argumentation is defeasible proper (by contrast to formally valid arguments)
(1.1d′	Being defeasible proper is a sign that the inference does not operate via formal validity)
1.1e	The deductive reformulation of analogy argumentation makes it non-defeasible
(1.1e′	That a reformulation of a defeasible argument scheme makes it non-defeasible is a sign that the reformulation changes something constitutional of the original scheme)
1.1f	Analogy argumentation does not ineliminably *use* a universal claim as the linking premise

argumentation-theoretical work [2005; 2009; 2015; 2016]. It is a cumulative complex argumentation with arguments instantiating the symptomatic scheme.

(1.1f′ A genuinely deductive argument would ineliminably use a universal claim as the linking premise)

1.1g Only inference by analogy employs same-level reasoning (particular to particular, or universal to universal) while all other types of inference employ 'different level reasoning' (particular to universal or universal to particular)

(1.1g′ That analogical inference, before it has been reformulated, has its own unique form of reasoning is a sign that it cannot be reduced to another type of argument scheme without changing what is essential to it)

Taken together, arguments 1.1a–1.1g appear to provide a strong reason for the *sui generis* view and they also in some sense mutually increase their respective justifications for the standpoint. In fact, the argumentation appears almost as to be verkill in the sense that, even if some of the arguments failed, the argumentation as a whole would still lend sufficient support to the standpoint. In conclusion, we can see that clue (I) (i.e., does the argument ineliminably refer to the analogue/source/comparison?) is a sign that speaks in *favor* of the non-deductive interpretation of analogy argumentation.

3.2. The *sui generis* view and universal claims

3.2.1. Botting's argumentation

With respect to consideration (II) (i.e., does the argument ineliminably refer to a universal claim?) and (IV) (i.e., is the inference a priori?), Botting argues that Juthe's *sui generis* account fails to explain the analogical inference in a way that keeps it genuinely *sui generis* because it tacitly assumes universal claims operating as premises in the inference, resulting in the scheme being reducible to a deductive inference.[26] According to Botting, Juthe's account confuses the horizontal (i.e., one-to-one correspondence) and the vertical relation (i.e., the determining relation), which are in fact two separate inferences [Botting 2017, pp. 12–14, 17–18], because claims of relevant similarity commits the arguer to the claim that features are universally or at least generally true [Botting 2017, pp. 18, 20], [Botting 2012a, pp. 103–104].

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[26] That is, if we disregard the effect of cumulative analogies, which Botting thinks refutes deductivism.

This counterargumentation can be reconstructed as follows[27]:

Reconstruction C [Botting's argumentation that the *sui generis* account fails]

1.	Juthe's account of analogy inference fails to be a *sui generis* account of analogy inference
1.1	It confuses the vertical relation and the horizontal relation, which are different tokens of inference
1.1.1a	The analogical inference operates in two inferential steps, the horizontal relation of which is the analogy inference
1.1.1b	Both the horizontal and vertical relations could be interpreted as being deductive types of inference
1.2	A one-to-one horizontal relation cannot dispense universal generalization as a premise
1.2.1a	The same determining relation cannot apply in the Target-Subject by means of a one-to-one relation unless this is generally true of anything that shares those elements.
1.2.1b	This universal generalization cannot just operate as a background assumption.
1.2.1b.1	The determining relation is not the analogical inference itself (i.e., only the one-to-one correspondence is the analogical inference).
1.2.1b.2	This determining relation can still be expressed as a material conditional
1.2.1b.2′	Once we have this conditional, the validity of the analogical inference depends solely on the logical concepts
1.3	*Sui generis* accounts must distinguish between relevant and irrelevant properties
1.3′	It is impossible to make those judgments of relevance without some universal claim, at least as a working hypothesis
1.3′.1	The arguer must be committed to some universal principle that underlies these judgments even if we cannot fully say what it is

In Section 3.2.2 I will criticize argument 1.1; 1.1.1a; 1.1.1b by arguing that the horizontal and the vertical relation cannot, *pace* Botting, oper-

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[27] I have attempted to formulate Botting's argumentation in the strongest way and have therefore taken 1.1, 1.2 and 1.3 as multiple argumentation (i.e., each are separately sufficient for the standpoint). There are argumentative indicators that Botting intends his argumentation to be taken in this way.

ate as separate inferences. In Section 3.2.3 I will refute argument 1.2 and I will also argue that its subarguments fail as linking premise 1.3′. In Section 3.2.4 I will criticize argument 1.3′.1 and also criticize Botting's claim that a deductive argument can work without the arguer having knowledge of its major premise. In Section 3.3 I will argue that clue (III) (i.e., whether the inference of deductive arguments is defeasible or not) is a sign in favor of the *sui generis* view of analogy. The final Section 3.4 will argue that concrete examples of *prima facie* analogy argumentation make no sense with a deductive reformulation, which constitutes yet another reason to reject the deductivist interpretation of analogy argumentation.

3.2.2. Relevant similarity cannot be separated

Why, then, cannot the one-to-one relation be separated from the determining relation? Remember that the distinction between the one-to-one correspondence and the determining relation is an *analysis of relevant similarity* and the predication that 'x is relevantly similar to y with respect to p' is an *attributive* predication, not a *predicative* predication.[28] For instance, a claim like: James is a good killer would not be read as predicating 'good' *separately* from 'killer', as in: James is good and: James is a killer but rather as something which *modifies* the second adjective and tells us *how skillful* James is at killing. Attributive predication, by contrast to predicative predication, tells us *something about* the modified predicate. Likewise, *relevance* is a dyadic rather than a monadic property. It would be absurd to think that the claim 'x is relevantly similar to y with respect to p' means:

> x is relevant to y with respect to p and x is similar to y with respect to p

as if relevance could be predicated *separately* from similarity. Rather, the relevance tells us *how x and y are similar*: that they are *relevantly similar* and that they are so with respect to p.[29] Analogy is always a

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[28] Peter Geach [1956] made this distinction. One plausible suggestion for an exact criterion for the distinction is that an attributive adjective is an adjective that can form predicable terms solely in combination with nouns [Rind and Tillinghast 2008].

[29] The reason that Juthe formulates the analogy scheme as expressing the determining relation and the one-to-one correspondence in separate premises (i.e., the "linking premise" and the "argument") is because a scheme is supposed to straight-

similarity of relation: x and y are similar with respect to p, and since p is relevant to q, we have reason to believe that x and y also both have q. Although relevance and similarity are not the same thing, you cannot *divide* relevant similarity into two separate entities, one labeled *relevance* and the other *similarity*. Rather, there is only one unified relation that holds between the Analogue and the Target-subject.[30] In the same way, although the one-to-one relation is not the same thing as the determining relation, they cannot operate *separately* but establish relevant similarity *together*: without relevant similarity you do not have an analogy, and only if both the determining relation and the one-to-one relations hold do we have relevant similarity. Just as inference via relevant similarity is one unified inference, so is the relation of one-to-one correspondence and the relation of determination necessary constituents of one single inference. It cannot be otherwise, because the relation of one-to-one correspondence and the determining relation is *ex hypothesi* an *analysis of* relevant similarity, and if the constituents of the latter are *essentially* inseparable, then so are the constituents of the former. Thus, the one-to-one correspondence and the determining relation are two essential constituents of analogy that cannot be separated into two independent inferential steps. Unfortunately, this erroneous separation between the one-to-one relation and the determining relation permeates almost all of Botting's critique of Juthe's *sui generis* account. This means that Botting's argument 1.2.1b.1 also fails to support 1.2.1b and 1.2.1a on its own is insufficient to support argument 1.2.

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forwardly express the crucial and essential features of the inferential principle; it should not be taken as thinking that they could operate separately. The fact that a horizontal one-to-one relation between elements implies that the elements stand in the same vertical determining relation should not prevent the scheme from displaying both these critical aspects in different premises; the analyst still needs to assess that both are true. Hence, epistemically, both need to be checked although they cannot be separated on a metaphysical level. I think that this fact may have led Botting in the wrong direction. It is also obscured by the fact that the term "comparable" is ambiguous between just the thin "similarity" and the thicker notion of "relevant similarity" and that Juthe, and other theorists, sometimes use "comparable" in both these senses.

[30] Relevance is, metaphysically speaking, a relational accident: you cannot have something that is relevant period; it is always relevant in relation to something else.

3.2.3. Analogical inference does not need general truths (as a premise)

I will here criticize Botting's argument 1.2 (The one-to-one horizontal relation cannot dispense universal generalization as a premise) and its subarguments (argumentation reconstruction C, in Section 3.2.1). Botting [2017, pp. 18, 20] argues:

> Sui generis views, while they may not appeal to a universal claim explicitly, do distinguish between relevant and irrelevant properties [...]. In making judgments about which properties that they have in common are relevant to the analogy and which are not, where these relevant properties are listed in the analogical argument, the arguer must be committed to some universal principle that underlies these judgments.

There are several problems with this argument. First, what makes Botting's argument *prima facie* credible is its ambiguous use of the term *committed*.[31] For instance, if I say: "You should eat your vegetables", then it is certainly clear that I am committed to some conditional that somehow attributes some good-making property to the eating of vegetables. But (assuming that I have no idea which one), I am not committed to a specific one. Botting speaks as if this distinction is not there, as I was committed to a specific one (the true one). But I am not. Imagine I believe that the statement "You should eat your vegetables", to which I am committed, is supported by the truth of the conditional "Eating vegetables attracts well-intentioned fairies". If I figure out that the conditional claim I thought supported my vegetable claim is really false I might also change my mind about the concrete vegetable claim, rather than commit myself to some other conditional claim. Hence, contrary to Botting's claim in argument 1.2.1b ('This universal generalization cannot just operate as a background assumption') of his argumentation (reconstruction C, Section 3.2.1), even if analogy argumentation is committed to some universal truth it certainly need not be a premise for the argumentation.

Second, it is also, furthermore inaccurate that analogical inference is committed to the assumption that relevant similarities must hold *generally* and much less universally. Now, there is reason to accept that claims like "similarity s between entity x and y is a relevant similarity for the conclusion that the further similarity s_2 exists between x and y" commits you to the claim that "s is a *pro tanto* reason for s_2" (a *pro*

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[31] A thanks to Katharina Stevens for pointing this out to me in comment of an earlier draft of this paper.

tanto reason is a contributing but overridable reason). The reason for this is that it is difficult to have an account of *relevant difference* without this *pro tanto* commitment [Guarini 2010, pp. 395–403]. For instance, if we compare three cases, it could be true that C1 is more similar to C2 than to C3, even though all three cases have the same relevant similarities, because there is a relevant *difference* between C3 compared to C1 and C2. Unless this relevant difference — whatever feature it is — is such that when it actually obtains it gives a *pro tanto* reason, it is difficult to explain why its *absence* can make a difference in the comparison between objects that are otherwise relevantly similar [Guarini 2010, pp. 395–403].

However, this fact does not help Botting's defense of deductivism because, while general truth imply, *pro tanto*, that a reason is *pro tanto* it does not entail that it is generally true.[32] A *pro tanto* reason could be overridden by other widely prevalent circumstances that render it not only not generally true but even generally false.[33] In fact, a *pro tanto* reason only means that it is a contributing but overridable reason: no more no less. Furthermore, as we shall see in Section 3.4 one cannot even use a premise with *pro tanto* qualification in combination with an additional universal premise to reformulate *prima facie* analogy argumentation into plausible deductive interpretation.

3.2.4. A deductive argument cannot work without its major premise

As stated in Section 3.1, one of the main lines against a deductivist interpretation of analogy argumentation has been either that it is impossible to supply a major premise with universal scope that remolds the argumentation into a deductively valid argument, or that when such a universal premise is added to an analogy argumentation it makes the argumentation much worse off as an argument, or simply does no justice to the pre-reconstructed text. This concerns again clue (II) [Does the argument ineliminably refer to a universal claim?] but from the opposite angle: the anti-deductivist argumentation rests on the assumption that deductive inference cannot work if we do not find the universal premise

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[32] If it is generally true that $p \rightarrow q$, then the fact that p entails a *pro tanto* reason for q. However, the reverse does not hold, if it is *pro tanto* that $p \rightarrow q$, then the fact that p does not entail that q is generally true.

[33] Notice that it makes no difference if the deductivist asserts that the *pro tanto* judgment is *universal* in the sense that 'it is universally true that $\in$ is a *pro tanto* reason for the Assigned-Predicate' because that is just to state what is trivial: '$\in$ is overridable reason for the Assigned-Predicate if no other reason overrides it'.

that makes it formally valid, and perhaps this is false. Botting [2017, pp. 19, 20] argues:

> the argument we give when we do make an explicit appeal to a universal claim is often weaker than when we do not; we were simply wrong about what universal claim we were following. However, this does not mean we must abandon any feeling that the validity of the argument rests ultimately on there being some universal claim that makes it deductively valid and that our intuitions are tracking such a rule, even when we struggle to formulate such a rule [. . .] the *sui generis* account seems to be in the same boat: just as you may be unsure what your universal claim should be, you can be equally unsure about what the similarities between the different cases actually are. Perhaps we do not need to specify elements ε and elements ε^*, and if so perhaps we do not make any kind of covert appeal to a universal generalization in making relevance judgments. But if we allow this, there is no principled reason to deny the same strategy to the deductivist.

Botting's account also contains the following lines from Juthe's text:

> An argument is committed to the existence of the ontological correctness conditions, but it can be a good argument even without knowing exactly what they are. Thus you do not need to know exactly about the detailed structure in order to employ it in an argument, just as you do not need to know every background assumption or unexpressed premise for a deductive argument in order to assess its validity.
>
> [Juthe 2015, p. 419]

to which Botting [2017, p. 21] comments:

> Juthe curiously undercuts his own case by noting (correctly) that deductivists may adopt precisely the same strategy. The moral is that not much follows from the fact that sometimes deductive reconstructions make our arguments appear less plausible than we took them to be.

However, the claim that you are (in general) equally unsure about the similarities as you are unsure of a universal claim is wrong: the judgment about particular situations is more secure than the judgment about abstract principles for the simple reason that it is *concrete* as opposed to abstract.[34] But what about the claim that we do not need the universal

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[34] Cohen [1986, pp. 82–91, see especially pp. 84–85] provides several reasons for why 'singular intuitions' should be regarded as more reliable than 'general intuitions'. However, the reason that singular intuitions are more reliable than general intuitions is, in my opinion, not between singular vs general per se, but because singular intu-

premise (or the relevant similarities)? This may appear as a strong objection against this type of anti-deductivist argumentation, and moreover, Juthe has myself approved of this strategy by his own admission. Or has he? Imagine the following dialogue:

A: Socrates is mortal
B: I doubt that
A: Yes he is, he is a human
B: So all humans are mortal?
A: I didn't say that, I have no clue why the fact that Socrates is human is a reason for believing that he is mortal [. . .] but I am positive that there exists a universal claim that in conjunction with this fact will comprise a formally valid reason for believing that he is mortal

No reasonable agent would accept A's final response as satisfactory, because there is a crucial difference between being unable to supply the *linking premise* (i.e., what corresponds to the major premise in a syllogism) and being unable to supply every other background assumption or unexpressed premise of an argumentation. The linking premise is what enables the 'argument' to be a reason for the standpoint and that which reveals what scheme the argumentation has used. Juthe has argued that the impossibility of providing a plausible candidate of the *linking premise* — also known as the major premise of an allegedly deductive inference — is a reason against a deductivist interpretation, which cannot be equated with the impossibility of providing just any unexpressed premise or background assumption. If we cannot, when asked, provide the major premise of our deductive argument then we do have a problem. Thus, if an *ex hypothesi* deductive argument like:

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itions, by the nature of the case, are about *concrete examples* while general intuitions are about *abstract* principles. If general intuitions were as concrete as singular intuitions the difference would vanish but being general essentially excludes being concrete and detailed. Concrete examples are more reliable than abstract principles since they are in a sense 'closer' to reality than abstract principles — the knowledge is, in a sense, more immediate. The map is judged true or false against reality, not the other way around. That is why a more concrete thought experiment is generally considered more trustworthy than an abstract hypothetical one, and why counterexamples work against abstract universal statements. There is an analogy with scientific research to be found here: it is the concrete experiments and observations that evaluate whether a certain abstract scientific hypothesis is verified or falsified, not the other way around. Thus, it is more reliable to determine the relevance of a certain feature by intuiting a concrete example than intuiting the feature in the abstract.

1.   Socrates is mortal
1.1   Socrates is human

Here, 1.1 supports 1 *ex hypothesi* by means of formal validity, which *does* commit the arguer to a major premise, like:

1.1′   All humans are mortal

Now, if the arguer cannot supply it even after scrutiny, then it *is* a problem for interpreting the argumentation as a deductively valid argument. All argumentation, including this one, assumes a virtually infinite amount of background assumptions that do not operate as the linking premise, which is what enables the argument to become a reason for the standpoint.[35] For instance, this argumentation is laden with presuppositions that support the assumption that the terms used in the argumentation have the identical sense throughout the inference: that humans exists; that the laws of logic are true; that 'Socrates' has a reference, to name but a few. But these are not unexpressed premises and certainly not the major premise of the inference, i.e., the 'linking premise'. Hence, Juthe, Govier, Guarini and other *sui generis* advocates, contend that the inability to supply the major premise that reformulates analogy argumentation into formally valid deductive arguments *is* a reason against such reformulation. This appears to remain untouched by Botting's objections.[36]

Here the contrasting perspectives — argumentation as a product vs argumentation as a process (see Section 2) — is pertinent because Botting's claim becomes even more counterintuitive with a process view: how can you have a reasoning process *by means of* a universal conditional which you do not even have an inkling of? Imagine that A's last response was:

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[35] There is even a distinction between presuppositions, assumptions, and presumptions, neither of which is the same as an unexpressed *premise* [Plumer 2017] see also [Plumer 1999].

[36] There is one point where Botting's criticism appears to be accurate, since Juthe in one instance confuses the linking premise with background assumptions: "a deductive argument may be committed to several implicit assumptions that we are not aware of, although we still understand that the argument is formally valid without being able to formulate the unexpressed linking premise" [Juthe 2015, p. 390]. What Juthe meant to say was "without being able to formulate every necessary assumption for the argument".

> I have no idea how I ended up with the deductively inferred conclusion,
> but I am positive that a universal truth somehow in my thought process
> deductively lead me to the conclusion that Socrates is mortal [...].

One cannot perform *justified analogical* reasoning unless one has an idea
about what is compared. Likewise one cannot perform *justified deductive*
reasoning without at least an idea of what universal claim deductively
leads to the conclusion.

3.3. Is defeasibility not a sign of *sui generis*?

In this section I will argue that clue (III) (i.e., whether the inference
of deductive arguments is defeasible or not), which would affect Juthe's
argument 1.1b and 1.1c (in reconstruction B in Section 3.1) is another
reason in support of the *sui generis* view. Botting claims that deductive
inferences are defeasible in the same sense as analogical inferences and
that the defeasiblity of the latter is thus no reason against deductivism:

> Juthe's [2015, pp. 384 and 393, and ff.13] other complaint against de-
> ductivism is that deductive arguments do not preserve plausibility or
> likelihood. But this is wrong. What you can say is that the conclusion
> is plausible relative to the premises, but this is effectively what you
> are saying about true conclusions as well, since there may come a time
> when, armed with new information, you wish to reject a conclusion and
> consequently a premise. Deductive arguments are defeasible in this
> sense and do not permit you to establish for all time that something is
> true. The curious thing is that Juthe seems to recognize this at [2015,
> p. 403], where he cites Tomić [2013].   [Botting 2017, pp. 23–24]

But this is just plain wrong. This is neither what *defeasible* means nor
what Juthe means by the claim that argumentation by analogy employs
defeasible reasoning [Juthe 2015, p. 403].[37] Whether or not an argumen-
tation is defeasible has nothing to do with whether or not a conclusion

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[37]   Botting misinterprets Juthe's description of the defeasibility of analogy argu-
mentation when he stresses that there is a real difference between the type of analogy
argumentation (i.e., "conclusive analogy"), which defeasibly confers the *same* degree
of justification on the standpoint as that of the argument and the type of analogy ar-
gumentation that defeasibly confers a *lesser* degree of justification (i.e., "inconclusive
analogy") although both are defeasible. Juthe's distinction was not between defeasible
vs non-defeasible arguments but between two *types* of analogy argumentation, *both* of
which are defeasible, but which *defeasibly confer different degrees of justification.* Even
though these two types of inference are both defeasible it can still be true that one
type defeasibly just makes the standpoint *probable*, whereas the other type defeasibly

is plausible relative to the premises, which is a trivial property of *every* formally valid argumentation.[38] Pollock [1995] drew an important distinction between two types of counterarguments that can defeat another argument — *rebutting* defeaters — and *undercutting* defeaters. The same distinction has been made by Pinto [2001, pp. 102–110] who distinguishes between defeaters that are *overriders* and defeaters that are *underminers*. Overriders (or "rebutters") are counterarguments that attack the standpoint with overriding reason in favor of the opposite standpoint. By contrast, underminers (or "undercutters") *undermine* the inference while questioning neither the premises (the 'argument', or the 'linking premise', in pragma-dialectical vocabulary) nor — yet — the conclusion. The notions of 'defeasibility' and 'undermining defeater' are intimately related. A defeasible argumentation is an argumentation whose argument scheme *allows* it to be defeated by an undermining defeater. That is, a defeasible inference is an inference that leaves room for any additional premises to change the support for the conclusion *without* attacking the original premises. For instance, consider a single argumentation that employs the symptomatic argument scheme (which is a defeasible scheme):

1. The truck is red
1.1 The truck looks red
1.1′ Objects that look red typically are red [symptomatic scheme]

This provides a *prima facie* reason for believing that the truck in question is red. However, let's say we receive information that another truck is shining its red lights on the truck in question, and we know that red light can make objects look red when they are not. This additional information *defeats* the *prima facie* reason, but it does not *override* it by directly attacking the standpoint; it is not a reason for thinking that the truck is *not* red, since red objects look red in red light too [Pollock 1995, p. 41]. Such information would provide a counterargument that *defeats* the argumentation by *undermining its inference*, by *neither* challenging its premises *nor* its conclusion, *nor yet* its scheme. That is, an *undermining* defeater must be distinguished from an "overriding defeater" i.e.,

makes the standpoint *certain* (i.e., makes it certain in the *absence* of any undermining defeater).

[38] The plausibility of the conclusion of a formally valid argument will be of the exact same degree as the plausibility of the premises since the conclusion follows by necessity if the premises are true.

a counterargument that defeats an argumentation by being an overriding reason for the opposite standpoint.[39] Only argument schemes that *permit* additional information can be defeated by an *undermining* defeater, which makes it a defeasible scheme proper. Deductive arguments are almost universally compact — they leave no room for additional premises to change the justification for the conclusion without attacking a premise.[40] In contrast, the inference in analogy argumentation is defeasible in the proper sense; they do leave open the possibility that additional information defeats the inference without questioning its premises. Thus, Juthe's argumentation 1.1b and 1.1b′ and 1.1c and 1.1c′ (reconstruction B, Section 3.1) appears untouched by Botting's criticism and clue (III) (i.e., 'is the inference defeasible?') *is* a reason for the *sui generis* view of analogy.

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[39] Furthermore, both these types of defeating counterarguments must be distinguished from a counterargument that *refutes* an argumentation by attacking one of its premises (including the linking premise). It may be tempting to think that an undermining defeater does attack the linking premise and the argument scheme of the argumentation, since the undermining defeater does work by undermining that which can be labeled the "inference link" between the argument and the standpoint. However, this is not so, it rather follows from the defeasibility of the scheme in question (i.e., from the fact that it is not compact; it permits additional information that can affect the support for the conclusion). An undermining defeater undermines the inference between the standpoint and its supporting argument, but *without* attacking the 'linking premise'. Note that the linking premise <1.1′ Objects that look red typically are red> is perfectly consistent with the additional truths that: <another truck shines its red lights on the truck in question and red lights can make objects look red when they are not>, which nevertheless defeats the inference that the truck is red because it looks red. The linking premise states that objects that look red *typically* are red, not that they are *always* red. Hence, the additional information *undermines* the inference *without* questioning the linking premise.

[40] Tomić's counterexample of a defeasible deductive argument does not affect this; it is an anomaly in an exceedingly vast ocean of data that formally valid arguments are compact. Furthermore, a closer look at Tomić's counterexample shows that is not like other (undermined) defeasible arguments, because although additional information makes a new conclusion preferable over the original conclusion, the premises in fact *continue to lend support* to the original conclusion. The added information does not *nullify* the inference, as happens in ordinary undermined inferences, it only makes a new conclusion preferable [Tomić 2013, pp. 355–356]. Thus, the inference is not defeated by being *undermined* in the sense that, in light of new information, the premises fail to transfer a reason for the conclusion, but rather that the new information *overrides* the force of the other premises and suggests a different conclusion. This particular deductive argument is not sufficiently compact to exclude such additional information; however, in ordinary defeasible arguments, the defeat of the inference makes the argument (although still true) *incapable* of conveying the acceptability of the premises to the conclusion, which is not the case with Tomić's example.

3.4. What do concrete examples show?

It is very important to look at concrete cases of argumentation because they provide concrete data and immediate intuitions that are undefiled by preconceived theories and frameworks. Deciding what is the most accurate reconstruction is always challenging since every such reconstruction demands interpretation, the adding of implicit elements, and so on. But if one reconstruction makes more sense of the pre-reconstructed example compared to an alternative one; it is certainly a reason in favor of that reconstruction. In order to clearly see the impotence of recasting analogy inference into deductive inference I will apply Waller's scheme (which Botting claims can correctly capture analogy argumentation) to a concrete example, chosen as the most *favorable* to a deductivist reinterpretation:

> Mental skills are like physical skills in that they are based on innate aptitudes and can be developed by training. We do not think that everyone should have an equal right to play for the varsity hockey team. So we should not expect that everyone has an equal right to attend university.[41]

This would be an instance of single argumentation by analogy, which according to Juthe's *sui generis* account would be reconstructed as follows:

1. We should not expect that everyone has an equal right to attend university [i.e., Only those with the right mental skills$_{TS}$ should have the right to attend$_{AP*}$ university$_{TS}$[42]

1.1. We do not think that everyone should have an equal right to play for the varsity hockey team (i.e., the innate aptitudes that can be developed by training of physical skills$_{\in}$ determines the right to play$_{AP}$ for the varsity hockey team$_A$).

1.1′ Mental skills are like physical skills in that they are based on innate aptitudes and can be developed by training (i.e., The innate aptitudes that can be developed by training of mental skills$_{\in*}$ correspond one-to-one with innate aptitudes that can be developed by training of physical skills$_{\in}$)

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[41] The example is taken from [Burbidge 1990, p. 22].

[42] The asterisk means that it is the *mutatis mutandis* Assigned-Predicate in the domain of the Target-Subject. Thus, it is a predicate in the domain of the Target-Subject that corresponds one-to-one with the Assigned-Predicate in the domain of the Analogue.

In other words, we can conclude that the Target-Subject [university] has the same determining relation to a counterpart *mutatis mutandis* Assigned-Predicate* [the right to attend university] as that of the Analogue [the varsity hockey team] because there is an element$_{\hat{1}*}$ [innate aptitude that can be developed by training of mental skills] in the Target-Subject that correspond one-to-one with the element$_{\hat{1}}$ [innate aptitude that can be developed by training of physical skills] in the Analogue, which determines the one-to-one corresponding Assigned-Predicate [equal right to play] of the Analogue. Applying Waller's scheme (see Section 3.1) and using the *pro tanto* qualification that was discussed in section 3.2.3, it would be reconstructed as follows:

1.　We agree that not everyone should have a right to play for the varsity hockey team
2.　The most plausible reason for believing this is the C principle: Certain skills developed by training of innate aptitudes is a *pro tanto* reason for the qualification to join certain groups
3.　Attending university requires mental skills developed by training of innate aptitudes
4.　Therefore, consistency requires that we should not expect everyone to have equal rights to attend university

This may *prima facie* look like an acceptable reconstruction. However, upon some reflection it becomes clear that the appeal to consistency has been made completely redundant to the conclusion:

1.　We agree that not everyone should have a right to play for the varsity hockey team
2.　The most plausible reason for believing this is the C principle: Certain skills developed by training of innate aptitudes is a *pro tanto* reason for the qualification to attend certain groups [i.e., all skills developed by training of innate aptitudes is a *pro tanto* reason for the qualification to join certain groups]
3.　Attending university requires mental skills developed by training of innate aptitudes [i.e., university falls under the C principle]
4*　Therefore, we have a reason not to expect everyone to have equal rights to attend university

Furthermore, since a *pro tanto* qualified proposition is *not* a general truth, the scheme needs an additional premise if the conclusion is to follow with deductive validity, such as:

2.*　In this case, there exists no reason that overrides the *pro tanto* reason C

Thus, it is not an instantiation of Waller's scheme, because it no longer needs any appeal to consistency, and it furthermore needs an additional premise to enable the inference to be deductive.

Another, more important, fact that disproves Botting's claim that Waller's scheme could replace the *sui generis* scheme, is that the pre-reconstructed argumentation is an inference *to* the *pro tanto* qualification rather than *from* it. Returning to the example, it starts with what the arguer thinks the interlocutor has *already* accepted (that what is relevant for the right to play for the varsity hockey team is physical skill which developed by training innate aptitudes), and continues by pointing out the similarity that mental skills are *also* developed by training innate aptitudes, *therefore* it should *also* be a relevant reason (i.e., at least a *pro tanto* reason) for treating the right to attend the university in the same way.[43] Thus, Waller's scheme cannot capture this feature of the original pre-reconstructed argumentation, whereas the analogy scheme can (and does). Finally, no *comparison* is needed with Waller's version. Hence, the argument with Waller's scheme is not an analogical inference in any sense of the word and cannot therefore be an example of what Botting calls 'deductive reductionism'.

But this was an example deliberately chosen to be charitable to a deductivist reinterpretation. Now, what happens if we drop the charity? It gets (much) worse for the deductivist. One such example is C. S Lewis's "strip-tease analogy" by [1952, p. 75] which I have cited as an example [Juthe 2015, p. 413], where Lewis appears to criticize the sexual culture of his time:

> You can get a large audience together for a strip-tease act — that is, to watch a girl undress on the stage. Now suppose you came to a country

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[43] Govier's objection against Waller's scheme is that if the 'C principle' really was implicit in the analogy itself then the analogy would be redundant. Furthermore, if the underlying 'C principle' is implicit in the way that Waller asserts, then the analogy cannot be labeled deductive either, since the only work that the analogy is doing is to show that there *is* a similarity [Govier 2002, 155–157]. In his paper, Guarini also defends a non-deductive analysis of argument by analogy along the same lines but in a more developed fashion, arguing that the 'C-principle' is not *used* in the inference [Guarini 2004]. My argument here is that the concrete feature of this analogy shows that the analogy is used (in conjunction with the principle of consistency) to *warrant* that a *pro tanto* principle should apply in another case, rather than that the principle itself is the warrant of the inference. Hence, it supports Govier's contention that the 'C-principle' is not even implicit in the analogy (at least not in the sense that it uses it to license the inference).

where you could fill a theatre simply by bringing a covered plate onto the stage and then slowly lifting the cover so as to let everyone see, just before the lights went out, that it contained a mutton chop or a bit of bacon, would you not think that in that country something had gone wrong with the appetite for food?

Juthe has shown that this argumentation can be readily reconstructed with his *sui generis* model [Juthe 2015, pp. 414–415] but what would a deductive reformulation with a reasonable universal premise that makes sense of the pre-reconstructed text look like? I leave that challenge to the reader. Botting appears to realize the difficulty of doing this and attempts to circumvent it by asserting that the example is not analogy argumentation at all but rather just an analogy *explanation* [Botting 2017, pp. 25–27]. Besides the many severe problems with this move[44] it strikes me as exceedingly counterintuitive and, furthermore, if these

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[44] There are four other separate reasons why such a move does not save deductivism from the power of concrete examples: (1) There are positive reasons against interpreting the examples as explanations. For instance, it is an empirical fact that Gerry Spence's lion analogy discussed in Juthe's article certainly did *function* as an *argument* within its own context (it convinced people to believe in the standpoint, etc.), which is a strong indication that it was indeed an argument rather than an explanation [Lief, Caldwell and Bycel 1998, pp. 121–127]. The same holds with Lewis's striptease analogy [Govier 2010, pp. 318–319]. Botting shows neither that the striptease analogy nor the lion analogy are explanations; he only *asserts* that they are, contrary to the empirical data of how they worked in their respective contexts. (2) The very distinction between argument and explanation is itself problematic [Dufour 2017; Kasachkoff 1988; Mayes 2010]. (3) Even if Juthe's examples are examples of when analogy would be used as explanations and not as argumentation, explanations can *work* as arguments as they are explaining. Consider the following dialogue:

A: Belief in objective values is incompatible with internalism (that values are response-dependent)
B: No it is not [. . .].
A: How come?
B: Because objective values could be like secondary qualities, just as we cannot adequately conceive of red otherwise than in terms of red experiences, neither can positive value be so conceived as apart from mentioning responses of moral approbation on our part. Hence, values could both be objective and still response-dependent, just like secondary qualities [. . .].

Is it unreasonable that B's last response — even though it may also be an explanation — is also a *reason to believe* the standpoint that belief in objective values is compatible with internalism? Sometimes the explanation is in itself a reason to believe the standpoint. Thus, in addition, Botting needs to show why these alleged explanations do not simultaneously operate as arguments. Furthermore, assuming that the examples are just analogy explanations and cannot be used as arguments, is not the fact that analogy explanation cannot be reduced to some other type of explanation a strong

analogies only operate as explanations, then one must be able to provide a plausible account of *what* they are supposed to explain. If Lewis's reasoning is in fact an explanation and not an argumentation, one must ask: an explanation of *what*? If Lewis's does not intend to *argue* for the conclusion "Something has gone wrong with the appetite for sex in today's society" then it is difficult to understand what it is he is trying to do at all. It certainly cannot be an explanation of *why* or *how* something has gone wrong with the appetite for sex in modern society, because what has happened in an *hypothetical* country cannot explain why something has gone wrong in an actual society. Could it be an explanation of what it "gone wrong with an appetite" *means*? Botting never states what the analogy is supposed to explain. But Lewis reasoning does not explain the *sense* of "gone wrong with an appetite"; rather, Lewis appears to assert that the sexual appetite in modern society *has* gone wrong and provides *a reason for thinking so.*[45]

This concludes Section 3, which has argued that all of Botting's suggested clues in fact support the *sui generis* view and speak against a deductivist reinterpretation, and that Botting's arguments all fail. In the final section I will argue that Juthe's *sui generis* model is better than an inductive reinterpretation of analogy argumentation that concerns clue (V) (is the inference one that can vary in strength in the appropriate ways?).

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argument for the *sui generis* view? Botting never provides any reformulation of the examples of alleged analogy explanations into inductive or deductive explanatory reasoning, which should be possible if analogical reasoning can be reduced to deductive or inductive reasoning. Or does Botting mean that reasoning that occurs in explanation by analogy are *sui generis* but that this does not hold for reasoning that occurs in argumentation by analogy? Or does he claim that explanations never use analogies? The former strikes me as inconsistent and the latter as exceedingly implausible and clearly against countless examples of analogies in scientific and philosophic history.

[45] The scope of this article does not permit a discussion of other such examples, like that of the lion analogy in the Silkwood case by prosecutor Spence, which are equally difficult to evade as explanations. For a full script of Spence's closing argument, see http://eejlaw.com/materials/Silkwood_v_Kerr-McGee_T10.pdf. Botting contends that the lion analogy only works to explain the meaning of strict liability, but this is highly implausible. Rather, the analogy shows that the historical case of the lion fell under the regulation of strict liability and that the current case of Silkwood is completely analogous, which means that the latter also falls under the regulation of strict liability. I refer to the original works [Lief, Caldwell and Bycel 1998, pp. 121–127] and to Juthe's treatment of them [Juthe 2015, pp. 431–436] and urge the reader to read them in their original context.

4. The inductive vs the *sui generis* account

Although Botting rejected all Juthe's explicit counterarguments against
deductivism he thinks Juthe does have an implicit argument that does
indeed refute deductivism. The implicit argument is that adding further
analogues seems to have a *cumulative* force that they would not have
on a deductivist analysis [Botting 2017, pp. 2, 5, 28–33]. Moreover,
according to Botting, this holds not only for ordinary analogical argu-
ments but, perhaps surprisingly, also for *a priori* analogy argumentation.
He argues that deductivism cannot explain our intuition that complex
analogy argumentation makes the standpoint *more* acceptable for each
added analogy, which appears to be the case in Juthe's examples of
complex analogy argumentation. Having several deductive arguments
for a standpoint does justify increased *confidence* that the standpoint is
true, because *all* the arguments need to be rebutted in order to rebut the
standpoint. However, a complex argumentation where each individual
argument makes the standpoint harder to rebut, is not the same as what
happen in a complex inductive argumentation where each individual ar-
gument/confirmation would increase the *inferential justification* of the
argumentation. Botting explains:

> A confirmation confirms or disconfirms a probability statement, but also
> tells you what new probability statement should replace it, because it is
> itself part of the frequency series. Both deductions and confirmations,
> when considered in complex argumentation, can change the confidence
> level without changing the inferential strength, but confirmations can
> change the inferential strength as well, whereas the only way a deduc-
> tion can change the inferential strength is if it is the deductive argument
> with the most acceptable premises, for the inferential strength will al-
> ways be the same as this and the standpoint will always be as acceptable
> as those premises.   [Botting 2017, p. 32]

I think that Botting's account of the inferential contrast between a com-
plex argumentation composed of deductive and inductive arguments is
accurate. However, I think he is wrong to say that complex analogy argu-
mentation increases the inferential strength in the same way as complex
inductive argumentation does and that it can be reduced to it.

Juthe's account of (mono) complex analogy argumentation means
that it is composed of a number of single analogy argumentations, each
instantiating the analogy scheme and adding one element of relevant

similarity to the comparison.[46] Thus, in a single analogy argumentation there is one analogy scheme with one element of comparison, and in complex argumentation by analogy — if this means a "complex made out of solely a number of single analogy argumentations" — there are many argumentations which instantiate this scheme, each of which adds a relevant similarity to the comparison. The most common structure of complex argumentation by analogy will be coordinatively compound argumentation, which would have the following structure:[47]

1. The Target-Subject$_{TS}$ has the Assigned-Predicate$_{AP^*}$
1.1 The element$_{\in_1 \ldots \in_4}$ of the Analogue$_A$ is correspond one-to-one to element$_\in$ with element$_{\in_1 \ldots \in_4^*}$ of the Target-Subject$_{TS}$[48]

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[46] In Juthe's analysis this means that in a single argumentation by analogy there is one scheme with one pair of elements of one-to-one correspondence, and in a mono complex argumentation by analogy there are a multitude of such arguments, each with one analogical scheme expressing a pair of elements in one-to-one correspondence.

[47] Botting [2017, pp. 29–30] misinterprets Juthe's model for complex argumentation by analogy in several ways. For instance, (1) Botting thinks that in its current formulation it does not allow for each single analogy argumentation to make a difference to the justification of the standpoint. However, it is Botting who misinterprets by assigning a too-strong content to "determines" which is only a way to explicate "relevant for"; the determination can be a very weak determination, which Juthe explicitly states in his account of the single analogy scheme. Thus, it should be clear that the failure of any of the arguments 1.1.1a–1.1.1d will decrease the justification for the standpoint. Each argument only *in part* determines the Assigned-Predicate (i.e., is relevant for) while together as a whole they form sufficient reason for accepting that the Target-Subject has the Assigned-Predicate. The very point of reconstructing complex analogy argumentation as *coordinatively compound* argumentation is that each failed single analogy argument will decrease the justification for the standpoint. However, in order to clarify, I have added "in part" to Juthe's original construct for each "determination". (2) Botting complains that Juthe's analysis does not seem to take into account elements that may be negatively relevant to the (vertical) relation of determination. But it should not: this is what makes analogy argumentation *defeasible* and one of the reasons that complex analogy argumentation can vary in strength. A counterargument could refute one of the single analogy arguments by showing that there are relevant differences (i.e., either that an element lacks a counterpart or that an element in the Target-Subject counteracts a determining relation), which therewith would weaken the argumentation as a whole although the remaining arguments still lend support to the standpoint.

[48] The main single argumentation 1.1 and 1.1′ claims that the Target-Subject is similar to the Analogue in all (or at least with respect to sufficiently many) of those aspects that are relevant for the Analogue having the Assigned-Predicate. Hence,

(1.1′   The elements$_{\in_1 \ldots \in_4}$ of the Analogue$_A$ determine the
              Analogue$_A$'s Assigned-Predicate$_{AP}$)
1.1.1a   The element$_{\in_1}$ of the Analogue$_A$ corresponds one-to-one to
              element$_{\in_1^*}$ of the Target-Subject$_{TS}$
(1.1.1a′   The element$_{\in_1}$ of the Analogue$_A$ element in part determines
              the Analogue$_A$'s Assigned-Predicate$_{AP}$)
1.1.1b   The element$_{\in_2}$ of the Analogue$_A$ corresponds one-to-one to
              element$_{\in_2^*}$ of the Target-Subject$_{TS}$
(1.1.1b′   The element$_{\in_2}$ of the Analogue$_A$ element in part determines
              the Analogue$_A$'s Assigned-Predicate$_{AP}$)
1.1.1c   The element$_{\in_3}$ of the Analogue$_A$ corresponds one-to-one to
              element$_{\in_3^*}$ of the Target-Subject$_{TS}$
(1.1.1c′   The element$_{\in_3}$ of the Analogue$_A$ element in part determines
              the Analogue$_A$'s Assigned-Predicate$_{AP}$)
1.1.1d   The element$_{\in_4}$ of the Analogue$_A$ corresponds one-to-one to
              element$_{\in_4^*}$ of the Target-Subject$_{TS}$
(1.1.'1d'   The element$_{\in_4}$ of the Analogue$_A$ element in part determines
              the Analogue$_A$'s Assigned-Predicate$_{AP}$)

However, Juthe divide the complexity of complex argumentation by analogy into three types: (1) whether the complexity occurs by means of supplying an added element of comparison for each added single argumentation, or (2) by means of supplying an additional entire analogue for each added single argumentation, or (3) by a combination of such single argumentations. Thus, an analogy argumentation can be made complex by adding another whole object of comparison next to the first comparison and not just adding further resemblances to the first comparison [Juthe 2015, pp. 428–429].

Botting argues that an inductive confirmation-theoretic approach to analogical inference makes better sense of our intuitions about the cumulative force of added analogical arguments than Juthe's *sui generis* account [Botting 2017, pp. 33–35]. It is clear that adding resemblances as well as a whole objection of comparisons makes an analogy argumentation stronger, and Botting's intuition is that complex argumentation by analogy is exactly like complex inductive argumentation — each added

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1.1 provides a defeasible reason for believing that also the Target-Subject has the Assigned-Predicate* (*mutatis mutandis*) and the remaining arguments are subarguments supporting single argumentation 1.1 and 1.1′.

argument increases not only the confidence that the standpoint is true but also the degree of justification of the inference. According to Botting, an inductive account is not better off than the *sui generis* account with respect to the type of complex analogy argumentation that adds whole additional objects of comparisons; they are on a par with how successfully they account for the fact that each added argument increases the confidence of the standpoint they support. However, the inductive interpretation has the advantage that it better explains why adding further resemblances increases the *inferential strength* of that type of complex analogy argumentation [Botting 2017, pp. 31, 33–35]. The addition of more resemblances is, together with an inductive interpretation, accounted for simply as more first-level confirmations, whereas additional analogues treat such confirmations themselves as data. The idea is that if the determining relation is projected in one case, it should be projected also in similar cases of similarity. Thus, the "analogical inference" moves to a meta-level where the lower-level inference is now effectively acting as the determining relation and the relation projected [Botting 2017, pp. 31, 33–35]. In this way, analogical inferences are treated as confirmation relations from particular to particular, which does not explicitly use a universal generalization, although it remains as a background assumption without needing definitive formulation [Botting 2012a].[49]

Furthermore, Botting argues, if the source confirms the target, then we would expect that the source would sometimes be used to explain the general predicate being attributed to the target, for although we would not necessarily have a specification of the universal claim that would explain (by subsuming) the predicate belonging to the target, we could at least use the source as a paradigm case to describe the universal claim and refer to it. In that context, Botting argues, it makes sense that some of Juthe's analogy argumentations are in fact explanations. Botting's argumentation concerning this can be summarized as follows:

Reconstruction D [Botting's argumentation for preferring an inductive interpretation]

1.   An inductive account of *ex hypothesi* analogy argumentation makes better sense of the cumulative force of added analogical arguments (including a priori analogies)

1.1a It better explains why adding resemblances increases the inferential strength of complex analogy argumentation

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[49] In PD terminology it does not act as the "linking premise".

1.1a′   Adding resemblances increases the inferential strength of complex analogy argumentation

1.1a.1   The higher-level inductions will directly affect the projectability of the predicate at the lower level and not only the degree of confidence we have with regard to the lower-level induction

1.1b   If the confirmation-theoretical account is right we would expect a certain kind of interchangeability between explanation and argument

(1.1b′   There is a certain kind of interchangeability between explanation and argument (as shown by Juthe's own examples))

I have already indirectly criticized argument 1.1b of this argumentation in Section 3.4, and one could add that an analogy could also often act as both an argument and an explanation, since the very essence of analogy is to view things in a new light without necessarily adding more facts to the matter. Hence, an interchangeability between explanation and argument holds also for analogies, even if it may not be for the same reason.

There is, however, a fatal flaw with Botting's argument 1.1a because its linking premise 1.1a′ is ambiguous between *two* ways of increasing the inferential strength: one may either increase the inferential strength by additional confirmations, or by adding relevant similarities. In the latter case, the increase in inferential strength by the addition of resemblances can *only* go so far as to *saturate* the elements that determine the Assigned-Predicate in the Analogue, which is not true of genuine inductive arguments. That is, in genuine argumentation by analogy, there would be no point in adding similarities *beyond* those features that are *relevant* for the Assigned-Predicate in the Analogue; in contrast, inductive arguments have no limit to how many confirmation-instances may be added. You can *forever* add another white swan to the sample and each will *continue* to increase the induction's degree of justification. This is not true of analogy argumentation in which there is no value in adding similarities beyond relevant similarities. This becomes very clear when we look at concrete examples. For instance, Richard Taylor [1956, pp. 194, 195, 205] has employed a complex analogy argumentation that memory needs no independent justification to be credible, which Juthe's *sui generis* model would reconstruct as follows:[50]

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[50] This is what Juthe would label "mono-complex analogy argumentation"; it is composed of analogy arguments only. Argumentation 1.1 and 1.1′ is the main argu-

1.   Memory needs no independent justification

1.1.   Perception needs no independent justification

1.1′   Memory is comparable to perception in all aspects relevant for the justification of perception [i.e., all elements that are part of what determines the justification of perception has a one-to-one corresponding element in memory]

1.1′.1a   The immediate awareness of perception is comparable to the immediate awareness of memory [i.e., immediate perception corresponds one-to-one with immediate awareness of memory]

(1.1′.1a′ Perception needs no independent justification by virtue of the perceiver being immediately aware of it) [i.e., the immediate awareness of perception determines in part why perception needs no independent justification]

1.1′.1b   Knowing about things by seeing more or less spatially distant things is comparable to knowing by remembering more or less temporally distant things and events [i.e., knowing about things by seeing more or less spatially distant things correspond one-to-one with remembering more or less temporally distant things and events]

(1.1′.1b′ That by seeing things we can be more or less certain in our knowledge of things that are more or less spatially distant is relevant to the fact that vision — although fallible — needs no independent justification.) [i.e., seeing things we can be more or less certain in our knowledge that things that are more or less spatially distant "determines" in part the fact that vision — although fallible — needs no independent justification.]

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mentation, which is subordinatively supported by large compound of coordinatively acting arguments supporting the linking premise 1.1′. The additional subarguments 1.1′.1a, 1.1′.1b and 1.1′.1c, are cumulative coordinative additions which add to the argumentative complexity, each constituting an added single analogical argument, and each adding one more element of relevant similarity which supports the claim of comparability (1.1′) making the argumentation overall cumulative coordinatively compound. The argument 1.1′.1c, however, is a complementary coordinative addition that refutes the anticipated objection that there is relevant difference between perception and memory with respect to immediate awareness. Note that this complementary argument is also an analogy argumentation. The complementary argument argues that an element that would *ex hypothesi* count against the immediate awareness of memory holds also in the case of perception.

1.1′.1c   The question how we ever manage to refer events back to a past of which we are not immediately aware is comparable to the question of how we ever achieve the notion of spatial distance, being immediately aware only of our sensations, which are not distant (for instance that our hands and feet are distant from each other, and both are distant from the surrounding furniture).

(1.1′.1c′   The question of how we ever achieve the notion of spatial distance, being immediately aware only of our sensations, is relevant to the lack of need for an independent justification of perception) [i.e., knowing that we do achieve the notion of spatial distance (even if we do not know how), being immediately aware only of our sensations determines "need no independent justification of perception"]

Now, Botting is right that each single argumentation (1.1′.1a; 1.1′.1b etc.) *does* add to the overall inferential strength, but not in an *inductive* way, where each argument adds another *confirmation*, because it would be meaningless to add *irrelevant* similarities like "both memory and perception are used by higher-order animals" or "both memory and perception are functions of the brain" etc., to this argumentation. Adding elements of similarity between memory and perception has value *only* insofar as they add up to the aspects *relevant for the justification of perception*. However, if this truly were an inductive argument *every* added similarity would count in favor of the inductive inference, which, clearly is not the case. Thus, each added relevant similarity strengthens the inference that they are *comparable* — analogous — with respect to the Assigned-Predicate (i.e., 'needs no independent justification'): they do not strengthen an inductive generalization.

    Second, *absences* of relevant similarities also play a crucial role in reasoning by analogy, which is another constitutional difference as compared to inductive reasoning. That is, a relevant difference — the *absence* of a certain similarity — could defeat an analogical inference by undercutting it, which is not true of inductive inferences.[51]

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[51]   The individuals in the sample of, say, white swans could have many differences among themselves but that would not change the fact that each white swan would continue to confirm that "swans are white". If a non-white swan appeared then it would be a disconfirmation, *overriding* the conclusion by conflicting evidence, but it would not defeat the confirmation inference of white swans by *undercutting* it.

Third, in an analogy not just the quantity but also the *quality* of similarities and differences play a role — some features are more important than others — which is not true in inductive confirmation where each instance of confirmation holds the same weight. In summary, for induction it is the *quantity of the confirmations* (and their classification) that is the critical issue, while for analogy it is rather the *quality of the comparison*; how well the comparison captures all the essential and relevant features.[52] Botting's argument that there is a methodological preference for a inductive interpretation over a *sui generis* account of analogy argumentation is therefore not just unwarranted: there is strong reason *against* such a position, as evidenced by the workings of complex analogy argumentation.

My point here is not that inductive inference cannot be undermined by additional information — of course it can: it is a defeasible type of inference. My point is that such undermining additional information is not the information about an *absence* of one similarity that undermines the inference of a present similarity to a second similarity. Consider as an example, the inference of an inductive argument such as the following

1.   Probably: Jane owns at least one item of woollen clothing.
1.1   Almost all residents of Inverness own at least one item of woollen clothing [predication of the sample]
1.1′   Jane is a resident of Inverness [the sample is of the same class as the population]

would certainly be undermined by additional information such as <Jane is allergic to wool>. However, this undermining is not the same as what occurs when the absence of a similarity (being allergic to wool) between Jane and others resident of Inverness undermines that a present similarity give reason for a second similarity. In order for the information to play that role, the argumentation must be essentially reformulated:

1.   Probably: Jane owns at least one item of woollen clothing.
1.1   Almost all residents of Inverness own at least one item of woollen clothing [i.e., being a resident of Inverness is relevant for owning at least one woollen clothing].
1.1′   Jane is similar with almost all residents of Inverness with respect to clothing.

However, with this reformulation, it is no longer an *inductive* scheme, but an *analogy* scheme.

[52] Note that one cannot object that the confirmation could concern the 'quantity of relevant similarities', and this for two reasons. First, again this would only repeat the problem that this 'quantity of similarities' is determined solely by what is *relevant for the analogue*; it is not determined whether or not they *confirm* instances of similarity as such. Second, the quantity of relevant differences also determines the value of the analogy, which is not true of pure induction. Third, the comparison of relevant similarity is never settled by *quantity* alone because some similarities as well as differences hold more *weight* than others — the quality of the similarities or differences is significant.

There are also constitutional differences that render it impossible to reduce analogical inference to inductive inference. An inductive inference essentially enables the inference by a claim of *classification of a sample* in conjunction with a claim of a certain *predication* of that sample. Thus, the inductive scheme is:[53]

1.   The population P has F. [Standpoint]
1.1   The sample has F. [Claim of predication]
(1.1′   The sample is of the same class as the population [claim of classification operating as the linking premise])

The linking premise 1.1′ is almost always unexpressed but it is an essential part of the inductive scheme. To give a classic example:

1.   Swans are white [i.e., the population of swans are white].
1.1   Individual swans 1, 2, 3 are white [the sample is white — i.e., a predication of the sample].
1.1′   The individuals 1, 2, 3 are swans [i.e., the sample is of the same class as the population of swans].

But analogical reasoning does not have a claim of classification acting as the linking premise in the argumentation but a claim of a comparison of relevant similarity; to justify a further similarity. In the *sui generis* scheme, it is clear that it does not classify any individual into a certain population, for doing so would make a constitutional change of the scheme into a different scheme: the inductive scheme.[54] The critical questions for the inductive scheme are also essentially different from those for the analogy scheme:[55]

(1) Are the sample and the population of the same class (should the sample be classified differently from the alleged population)?
(2) Is the predication of the sample essential for the sample (and in turn for the population)?
(3) Is the quantity of the sample enough to warrant a generalization of the population?

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[53] I credit this scheme to John Burbidge [1990, p. 43]; however, I reject his claim that inductive arguments are just variants of arguments by analogy.

[54] Note the difference between what is a gap-filling linking premise and what is a background assumption. Analogy argumentation may have certain classifications as background assumptions (comparisons are often constrained by a categorization of what objects are compared).

[55] The first two critical questions should be credited to Burbidge [1990, p. 45].

The critical questions for the analogy scheme are (with some variation in different works) [van Eemeren et al. 2007, p. 139] and [van Eemeren et al. 2009, p. 168]:

(1) Are the things that are compared actually comparable?
(2) Are there enough relevant similarities between the things that are compared?
(3) Are there any relevant differences between the things that are compared?

Hence, the fact that the criteria for assessing the schemes are different is another reason for believing that analogy and induction are essentially dissimilar schemes. In conclusion, I think we have good reason to believe that analogical inference is *sui generis* after all, and that Botting's defense of an inductive interpretation fails.

Summary and conclusion

The discussion of how to understand analogical inference is important, controversial, and ongoing. Accounts of analogical inference can usually be classified into four broad groups: abductive, deductive, inductive, and *sui generis*. Deductivists assert that analogy argumentation can be reduced to a deductive inference or perhaps to an inductive inference. This paper has argued that we have good reason to reject a deductivist interpretation and that we should accept the *sui generis* account of analogical inference.

According to Botting, there were five considerations relevant to the assessment as to whether or not analogy can be reduced to another type of inference:

  (I) Does the argument ineliminably refer to the analogue/source/comparison?
 (II) Does the argument ineliminably refer to a universal claim?
(III) Is the inference defeasible?
(IV) Is the inference *a priori*?
 (V) Is the inference one that can vary in strength in the appropriate ways?

I have in this paper argued that all these considerations support the view that analogical inference is *sui generis*. The paper has focused on Juthe's

sui generis account and Botting's criticisms thereof and has argued that the criticisms fails. The many arguments against an deductivistic interpretation of analogy argumentation remain unharmed by Botting's critique and still hold against deductivism. In addition, this paper has argued that an inductive interpretation is not better than a *sui generis* account of *prima facie* analogy argumentation. Rather, there are good reasons to maintain that argumentation by analogy employs its own *sui generis* type of inference, which is essentially different from both the deductive and inductive kinds of inference.

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