

## A Method for Evaluation of Arguments from Analogy

### Un método para evaluar argumentos por analogía

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**Abstract:** It is a common view that arguments from analogy can only be evaluated on a case-by-case basis. However, while this reflects an important insight, I propose instead a relatively simple method for their evaluation based on just (i) their general form and (ii) four core questions. One clear advantage of this proposal is that it does not depend on any substantial (and controversial) view of similarity, unlike some influential alternative methods, such as Walton's. Following some initial clarification of the notion of analogy and similarity, I demonstrate the strength of this method by analysing and evaluating three prominent arguments from analogy.

**Keywords:** Analogy, similarity, arguments from analogy, general form, evaluation.

**Resumen:** Es una visión común que los argumentos por analogía solo pueden ser evaluados sobre la base del caso a caso. No obstante, y a pesar de que esto refleja un elemento importante, propongo un método simple para su evaluación basado en (i) su forma general y (ii) cuatro preguntas medulares. Siguiendo algunas clarificaciones iniciales sobre la noción de analogía y similitud, demuestro la fuerza de este método analizando y evaluando tres argumentaciones por analogía prominentes.

**Palabras clave:** Analogía, similitud, argumentos por analogía, forma general, evaluation.

### 1. Introduction

In both ordinary and academic thought and talk, a very common type of argument is arguments from analogy. It is natural, therefore, that such ar-

guments are considered important to critical thinking and its textbooks. McKay (2000), Salmon (2012) and Kelley (2013), for instance, each devotes a chapter to them.<sup>1</sup> However, there is no consensus on how such arguments should be evaluated, so it is an open question how to tell whether or not a particular argument from analogy is cogent or not, good or bad. In this paper, I shall put forward a simple method for answering this question. Note that, other things being equal, the virtue of simplicity is particularly attractive for a subject area like critical thinking, which is highly orientated towards applications and practice. This includes, of course, the popular teaching of it to students from majors other than philosophy: often their focus has to be on the most applicable and simple parts of critical thinking in general and arguments from analogy in particular.

In order to put forward such a method, we need two things. Firstly, we need to possess a proper understanding of what I shall call the “general form” of arguments from analogy. For only when we can put a given argument from analogy in its general form are we able to explicate it sufficiently to evaluate it. Secondly, we need to know the basic questions or parameters for its evaluation given its general form (that is, roughly, a method for evaluating it given this general form). I shall propose such a general form and a total of four evaluation questions, based in particular on work by McKay (2000) and Divers (1997). Putting an argument from analogy into this general form and answering the four evaluation questions jointly provide a method for how to evaluate an argument from analogy.

## **2. Analogy and Similarity**

As pointed out by Juthe (2005), a considerable proportion of reasoning using analogy actually is not in the form of arguments. A lot of use of analogies instead consists in attempts at describing phenomena and enhancing our understanding of them; in particular, phenomena that are unfamiliar to us. But as Juthe himself, I shall focus on reasoning with analogies that involve “arguments from analogy”. However, for this we first need to briefly

<sup>1</sup> Their importance is by no means universally recognised, however: Fisher (2004), for example, does not even seem to mention them (though Fisher (2011) does).

expound the notion of analogy in itself. At the heart of this notion is the concept of *similarity*.

To call something “an analogy” or “analogous” is to say that it is similar to something else, in a respect that is understood in the context in which it is claimed. To say that two cases are analogous or that one is an analogy of the other is thus to make a certain comparison between the two cases. The first case we shall call the *theme*; the second case, which is claimed to be analogous to the theme, we shall call the *analogue*. The analogy is the relationship of similarity between the two.<sup>2</sup> In the so-called “descriptive” use of analogies, they are used merely to describe the theme. Consider an interesting example of the descriptive use of analogy (McKay, 2000, p. 102): “The galaxies are receding from each other like raisins in a pudding that is spreading out over the floor.” Using this analogy makes the claims there is a similarity between the galaxies receding from another (the theme) and the raisins receding from another in a pudding spreading out over the floor (the analogue). It is this feature of similarity that is the most basic feature of an analogy. Indeed, the descriptive use of analogy is a special case of a *simile* – a very common figure of speech in which something is likened to something else, usually preceded by the word “as” or, as in this example, “like”, e.g. “He was cold as ice” and “Love is like a rollercoaster”.<sup>3</sup>

While the descriptive use of analogy in itself does not play any very important role in arguments in our sense, it is very useful in general thought and talk. For it provides a helpful way of making vivid something that is difficult to visualise. Raisins spreading in a pudding on the floor is easy to picture, but galaxies spreading from one another certainly is not, and similarly in other cases of the descriptive use of analogy.

A descriptive use of analogy often suggests that there are more than one respect of similarity between the theme and the analogue, or more precisely, more than one property shared by the theme and the analogue. This is a general feature of analogies – and points to a general problem with them: their *scope*. It is often not very clear how many features the theme and the

<sup>2</sup> The word “analogy” is commonly also used for the analogue itself, but it is useful to have a specific term for it (“analogue”).

<sup>3</sup> Not to be confused with metaphors, which do not assert similarity, but attribute a property or make a claim of identity in a non-literal sense *without* the use of “like” or “as”, e.g. “His eyes were burning with anger” and “She is a rising star”.

analogue are supposed to share. Raisins in a pudding spreading out over the floor recede from each other derivatively on the spreading out of the pudding; specifically, as parts of the spreading out of the material they are embedded in. But it is not clear if the analogy suggests that this is also the way galaxies recede from each other.

This uncertainty about the scope of analogy is reflected in a general indeterminacy in the evaluation of arguments from analogy. It is arguably one of the main reasons why these arguments have to be evaluated on a case-by-case basis, as is often held. One way round this predicament is perhaps to provide a definition or theory of similarity that fits in with the evaluation of arguments from analogy. A lot of effort in the literature on is devoted to this: see, for instance, Walton (2012). The method I am proposing here, however, does not require any particular substantial of similarity. Accordingly, in the following section, I shall attempt to apply one and the same “general” method to three different examples of arguments from analogy, all the while being as quiet as possible about similarity.

### 3. Evaluation of Arguments from Analogy

In an argument from analogy, the analogy is used to draw the conclusion that a thing or case has a certain property because it is similar to another case which has that property. Specifically, it is held that a certain case A, the analogue, is similar to another case T, the theme; that A has the property G; and that *therefore* T has property G too.

Accordingly, a more precise rendering of the form of arguments from analogy on this construal is this:

#### *The General Form of Arguments from Analogy*

(P1) A (the analogue) and T (the theme) are similar (analogous) in that they both have properties F<sub>1</sub>,..., F<sub>n</sub>.

(P2) A has the additional property G.

∴ T has the property G.<sup>4</sup>

<sup>4</sup> This is very much a “traditional” formulation of the form of arguments from analogy, which found one of its classic expressions in Thomas Reid’s *Essays on the Intellectual*

Consider now an example of an argument from analogy:

**Case 1:**

The balance of payments is a measure of economic health, not a cause of it; restricting imports to reduce that deficit is like sticking the thermometer in ice water to bring down a feverish temperature.<sup>5</sup>

Here the conclusion, which is merely implied, is that one should not restrict imports in order to reduce the payment deficit. To understand this argument, let us first say that trying to reduce a feverish temperature by sticking the thermometer in ice water is trying to change bodily health by manipulating one of its indicators (temperature). The author implies that (i) one cannot reduce a feverish temperature in this way and – arguably – also that one should not try to do so. Let us further say that trying to reduce a payment deficit by restricting imports is likewise trying to change economic health by manipulating one of its indicators (a payment deficit). The author implies that (ii) one cannot reduce a payment deficit that way either and – arguably again – also that one should not try to do it.

Thus, the example instantiates the general form of arguments from analogy as follows:

(1) Bodily health and economic health are similar in that they both have properties F<sub>1</sub>,..., F<sub>n</sub>.

(2) Bodily health has the additional property of “not being changeable by manipulation of its indicators” and one should not try to do this (such that one cannot reduce a feverish temperature by sticking a thermometer in ice water and should not try to do this).

∴ Economic health has the property of “not being changeable by manipu-

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*Powers of Man* (Essay 1, Ch. 4). An influential similar formulation among contemporary authors is Walton’s “argumentation scheme” for arguments from analogy (Walton *et al.*, pp. 56, 315).

<sup>5</sup>Michael Kinsley, “Keep Trade Free”, *The New Republic*, vol. 188 (1983), p. 111, quoted in McKay (2000, p. 110).

lation of its indicators” and one should not try to do this (such that one cannot reduce a payment deficit by restricting imports and should not try to do this).

The clarification of the argument obtained by putting it in general form like this will enable us to formulate the core questions required for evaluation of arguments from analogy. What should these questions “ask to”, i.e. concern? They should not concern whether or not arguments from analogy are deductively valid, since, I shall assume, arguments from analogy are deductively invalid.<sup>6</sup> Rather, they should concern how “reasonable” the argument is. “Reasonable” means “agreeable to reason”, a notion that I shall not attempt to elucidate here (it suffices for our purposes to take it as primitive). An argument from analogy can be more or less reasonable. The more reasonable it is, the better it is; and conversely, the less reasonable it is, the worse it is. Unfortunately, there are not any straightforward criteria for when an argument from analogy is reasonable. We can, however, as pointed out by Divers (1997), ask the following four questions when trying to evaluate an argument from analogy, and this will get us a long way:

*Divers’ Four Core Questions for Arguments from Analogy*

(Q1) Which two cases, A and T, are claimed to be similar (analogous)?

(Q2) (i) What (property or) properties  $F_1, \dots, F_n$  are supposed to make A and T similar (and from which further similarity is inferred) and (ii) is this supposition reasonable?

(Q3) What property G is attributed to T in the conclusion?

(Q4) (i) What kind of connection is supposed to exist between  $F_1, \dots, F_n$  and G and (ii) is this supposition reasonable?

These questions are endorsed from Divers (ibid.), though the evaluative additions (Q2ii) and (Q4ii) are my own. It is beyond the scope of this paper to

<sup>6</sup> This is not an uncontroversial assumption (cf. e.g. Shecaira, 2013), but one that need not concern us in this paper.

give any independent account of them. For our present purposes, they are simply to be taken at face value and justified by the work they are brought to do below. They are my version of Walton's "critical questions" for arguments from analogy: as Walton points out, any argumentation scheme (my "general form") has associated with it a set of such "critical" questions which can be used in the evaluation of the type of argument represented by the scheme (Walton *et al* 2008, pp. 15ff). Walton's own set of critical questions for his argumentation scheme for arguments from analogy (*ibid.*, p. 315) mainly concerns the notion of similarity (specifically, 2 of the 3 questions constituting the set). In line with his emphasis on this notion, he puts forward models of similarity using so-called "stories" or "scripts" from artificial intelligence (Walton 2012; Walton 2013, pp. 34-38). As mentioned above, the method I propose here attempts to sidestep specific views of similarity. I believe this is one of its advantages – especially for the purposes of teaching arguments from analogy in critical thinking – but this is not something I shall discuss in the present paper.

Of Divers' four questions, it is (Q2) and Q(4) that are critical; (Q1) and (Q3) are only needed for specification of the parameters A, T and G. Is it reasonable to postulate the property or properties identified in the answer to (Q2), and is it reasonable to postulate the kind of connection identified in the answer to (Q4)? If, and only if, the answers to both of these questions are affirmative, we shall say that the argument from analogy in case as a whole is "reasonable". If, on the contrary, the answer to one or both of them is "no", we might choose to say that the argument from analogy is a fallacy of false analogy.

To see these questions at work, let us answer each of them for Case 1:

(1) It is easy to determine that the two things that are claimed to be analogous are bodily health (A) and economic health (T), thereby answering (Q1).

(2) By contrast, it is not as easy to answer (Q2). For in Case 1, as in many other arguments from analogy, the (property or) properties which are supposed to make the theme and the analogue similar are not made explicit. Fortunately, however, we can normally *infer* which (property or) proper-

ties the proponent of the argument is tacitly assuming to be involved. Thus, in this example, it seems clear that both the state of the economy involved and the state of the body involved are claimed to be cases of “health”. So A (bodily health) and T (economic health) are assumed to share “health-related” properties such as “being more or less wholesome,” “depending for its wholesomeness on the functioning of its parts”, and so on.

Is this supposition reasonable? Yes, intuitively, just like we often talk of the “health” of complex systems other than bodies, including computers, cars, families, teams, societies etc., and assume they share “health-related” properties with bodies, it seems to be a reasonable assumption that both the state of the body and the state of the economy share the mentioned features.

(3) Like the first question, (Q3) can be answered trivially. The property G attributed to T (economic health) in the conclusion is, as stated explicitly in the general form for the argument, simply the property of “not being changeable by manipulation of its indicators”.

(4) The final question, (Q4), however, is more difficult. The connection between the shared (property or) properties  $F_1, \dots, F_n$  and the property G attributed to economic health in the conclusion is probably assumed by the proponent of the argument to be similar if not identical to the connection between these properties and G for the *analogue* (bodily health). If so, it is arguably some kind of law-like connection which determines connections between properties and what is and what is not possible.

Is this supposition reasonable? Yes, it is. For it is it plausible that there is a law-like connection which rules out that it is possible for a state to have the properties of “being more or less wholesome,” “depending for its wholesomeness on the functioning of its parts” etc. ( $F_1, \dots, F_n$ ) and simultaneously to *lack* the negative property of “not being changeable by manipulation of its indicators” (G). We certainly have strong evidence based on observations of bodily health that such a connection holds for it. There is a question of which sense of “possible” is afoot here, but this we need not go into. For whichever it is, it seems very plausible that *if* the theme, here economic health, also has  $F_1, \dots, F_n$  – and, as mentioned, that seems



a reasonable assumption – *then* it too has G. In short, this argument from analogy is reasonable.

Let us consider a second case of an argument from analogy, and employ again our method of the general form and the four core questions. The following is from an essay by C.S. Lewis:

**Case 2:**

You can get a large audience together for a strip-tease act – that is, to watch a girl undress on the stage. Now suppose that you came to a country 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 else 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? (1952, p. 75)

The analogue (A) here is mutton chop/appetite for food and the theme (T) is strip-tease shows/appetite for sex. Of course, this analogue is imagined only, but this does not matter for our purposes.<sup>7</sup> The example instantiates the general form like this:

(P1) Appetite for food (mutton chop) and appetite for sex (strip-tease shows) are similar in that they both have properties F<sub>1</sub>,..., F<sub>n</sub>.

(P2) Appetite for food has the additional property of having gone wrong (having become unhealthy) when it attracts a large audience who pay to have it peeked by watching unveiling of its objects on stage.

∴ Appetite for sex has the property of having gone wrong when it attracts a large audience who pay to have it peeked by watching unveiling of its objects on stage.

<sup>7</sup> Since the analogue is imagined only, we might say, using the terminology of Govier (2012), that this is an example of an *a priori* argument from analogy, as opposed to the *inductive* argument from analogy of Case 1.

Consider next the four core questions:

(1) It is easy to determine that the two things that are claimed to be analogous are unveiled mutton chop/appetite for food (A) and strip-tease shows/appetite for sex (T).

(2) The property or properties that are supposed to make A and T similar are that, roughly, people will gather (and pay) to have this appetite stimulated/peaked by “teasing” presentation of its object on stage (which of course is merely imagined in case of the food appetites).

In my view, this (imagined) similarity does not seem reasonable. There are similarities between appetite for food and appetite for sex, such as both of them having a physiological underpinning, but one of the major dissimilarities is that it is entirely normal (in a certain cross-cultural sense) for a huge part of the appetite (drive) for sex to be directed at other objects than the biological act of sex it self – indeed, on some views, such as perhaps those of Freud, more or less *everything*. By contrast, this is arguably not the case for appetite for food: it is mainly only directed at food itself, and derivatively only at its closely related antecedents, such as anticipating eating or cooking. Thus, the analogy is not plausible.

(3) Like in our previous example, it is easy to answer (Q3). The property attributed to T in the conclusion is the property of having gone wrong.

(4) Finally, we come to (Q4). The connection between  $F_1, \dots, F_n$  and the property of having gone wrong may be that  $F_1, \dots, F_n$  concern natural appetites whose satisfaction are incompatible with the “wrong” behaviour mentioned by Lewis, or something along those lines. Recall in any case that a good evaluation in the answer to each of (Q4) and (Q2) is a necessary condition for the argument in case being reasonable, and since we already demonstrated that this is not the case for (Q2), we do not need to attend very carefully to (Q4).

Thus we can conclude that Lewis’s argument from analogy is not reasonable. In a more formal manner of speaking, it is “fallacious”.

The fact that an argument from analogy can fail as an argument is, like

the general problem with the scope of analogies mentioned above, related to the notion of similarity (“being analogous to”). Everything is similar to everything else in indefinitely many respects. For that reason, in a sense, *anything* can be said to be an analogy of any entity! To avoid this trivialisation of analogies – and to avoid committing the fallacy of false analogy – it is important to be aware of which properties are singled out and claimed to be shared by the theme and the analogue. They should be non-trivial properties and they should be properties that concern important aspects of each. The properties which we found reasonable in our analysis of Case 1 – “being more or less wholesome,” “depending for its wholesomeness on the functioning of its parts”, and so on – are good examples of such properties. What such properties are varies from case to case. But we can say something general about what they are *not*. They are not properties such as “being an entity”, “being self-identical”, “being coloured if green”, and other properties which necessarily applies to any object whatsoever. For since they apply to any object, the similarity that comes from sharing them is precisely not non-trivial.

But clearly, as our method of evaluation shows, no such trivial properties are involved in Case 2. Nonetheless, one might have had a knee-jerk reaction to this argument as being weak anyway, holding that the element of *disanalogy* uncovered in the answer to (Q2) simply is too obvious.

Consider, therefore, an argument from analogy where it in any case is *not* obvious whether the analogy is implausible or not. The following passage from a classic work by Viktor Frankl is our example of this:

### **Case 3:**

A man’s suffering is similar to the behaviour of a gas. If a certain quantity of gas is pumped into an empty chamber, it will fill the chamber evenly, no matter how big the chamber. Thus suffering completely fills the human soul and conscious mind, no matter whether the suffering is great or little. Therefore the “size” of human suffering is [...] relative. (1946, p. 55)

The analogue A here is the size of a certain quantity of gas and the theme T the “size” of human suffering. Frankl seems to be implicitly assuming some

kind of equivalence between the alleged fact that suffering completely fills the human soul and conscious mind and its “size” being relative. If so, on a charitable reading of the quoted passage, he is also implicitly assuming some (very similar) kind of equivalence between the alleged fact that a gas fills an empty chamber and its size being relative. These assumptions are problematic, but fortunately not something we need to go into here. Suffice is to say that, given these assumptions, we should not really separate the passage’s explicit conclusion of suffering’s “size” being relative from the claim of its completely filling the human soul and conscious mind. Let us do this in the comparatively informal manner of the following formulation of the general form of the argument:

(1) The behaviour of a gas and human suffering are similar in that they both have properties  $F_1, \dots, F_n$ .

(2) A quantity of gas (big or small) has the additional property that when pumped into a chamber, it fills it evenly, no matter how big the chamber; that is, its size is relative.

∴ Human suffering has the property that that it completely fills the human soul and conscious mind, whether the suffering is great or small; that is, its size is relative.

Let us next answer the four core questions for this argument:

(1) As already mentioned, the two things that are claimed to be analogous are the size of a certain quantity of gas (A) and the “size” of human suffering (T).

(2) The property or properties that are supposed to make A and T similar in this case are that, roughly, a gas occupying a chamber is similar to human suffering “occupying” the conscious mind.

Is it plausible to postulate this property? Well, that depends on how we consider the highly metaphorical claim that there is the involved similarity. We of course commonly employ analogies and metaphors (the differ-

ence between analogies and metaphors does not matter to our purposes here) in our thought and talk about mental matters, e.g. when we claim there is a gap – analogous to a spatial gap – between thinking about doing something and actually doing it, and we often do this as a matter of course (Johnson and Lakoff 2003). But this takes place with common (and “dead”) metaphors, and it is one thing to use such common metaphors, it is quite another to use a highly speculative and controversial one as Frankl does here.<sup>8</sup> Thus, without a lot of independent justification, I would argue that positing this similarity and hence the involved property is implausible.

(3) Like in our previous examples, it is straightforward to answer (Q3). The property attributed to T in the conclusion is stated explicitly there: Human suffering has the property that its “size” is relative in the sense that it completely fills the human soul and conscious mind, whether the suffering is great or small.

(4) Finally, we come to (Q4). However, since we have already seen that the similarity, or property, allegedly shared by A and T is not plausible, we have sufficient reason to conclude that this argument from analogy is not reasonable. The answer to (Q4), whatever it may be, is thus not needed in this case either.

In Frankl’s case, like in Lewis’s, the failure of the argument is thus already exposed in the answer to (Q2), halfway through the four core questions. By contrast, in our example of a “reasonable” argument from analogy – Case 1 above – we need to go through every one of the questions. In future research, I intend to investigate if this asymmetric pattern can be generalized to all arguments from analogy susceptible to the simple method of evaluation advocated in the present paper.

<sup>8</sup> It may be that the “size” of suffering is relative in the sense at issue – a view which Frankl argues for in various ways – and if so, it is reasonable to liken it to the adduced fact about a gas. But whether or not this controversial view is correct is a matter independent of the evaluation of the present argument from analogy in itself.

#### 4. Conclusion

If what I have argued in this paper is correct, my proposed method for evaluation of arguments from analogy is able to do useful work. This method consists only of the general form of these arguments along with four “critical questions”. Importantly, it is simpler than other methods that rely on a substantial notion of similarity, such as Walton’s. As we saw, it is true that the notion of similarity is central to the notion of analogy, and my method of course mentions the former. But, perhaps ironically, it does not require any particular view of this notion. Since it is thus not burdened by having to carry on its shoulders an accompanying definition, model or theory of similarity, it is simple and flexible. This makes it fit in well with the common view that arguments from analogy should be evaluated on a case-by-case basis. Of course, further theoretical work is needed to compare in detail my method with Walton’s and others’ similarity-orientated theories. In addition, other, more applied, research incorporating education science is required to argue for my specific view that my method is superior in the context of teaching of arguments from analogy in critical thinking. But at this point, I hope some initial proof of my method’s pudding has been shown by the use of it in the present paper.<sup>9</sup>

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