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Author: John Woods

In Response to: Marcello Guarini's *On the limitations of the Woods-Hudak reconstruction of analogical argument*

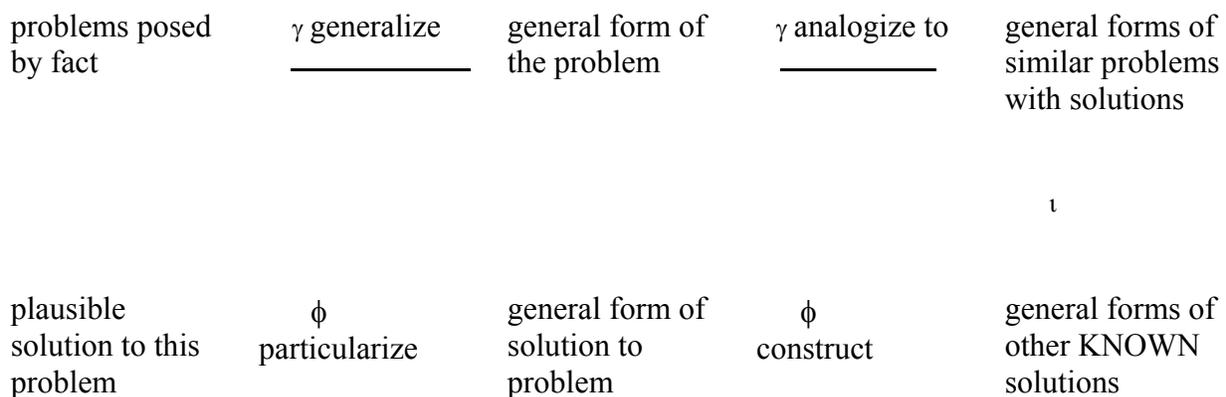
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I am grateful to Marcello Guarini for the careful attention he has given “By Parity of Reasoning,” which I published with Brent Hudak in 1990. Thirteen years on, it is apparent that our account of analogical arguments harbours some obscurities that, in turn, give rise to the appearance if not the reality of outright error. I think that I can best honour Guarini’s contribution not by answering it point by point; for not even I am ready to defend the original paper in every particular. Better, I think, to try again and see whether Guarini’s objections have been satisfactorily dealt with in the retelling.

One point of difference between then and now, is that I better appreciate the role of analogy in abductive reasoning, typified but not exhausted by best-explanation inferences. So in our present reprise, let me start there. A central task for the theorist of abduction is to elucidate the mechanics of hypothesis selection; in particular, he must try to answer the question of how, from an indefinitely large set of possibilities, only certain ones manage to qualify as candidate-explainers. Consider the following two schematic suggestions.

Analogical Argument

Darden’s Schema



Darden’s Schema [Darden, 1976, p. 142] reflects Hanson’s influence, as evidenced by the following summary [Hanson, 1961, p. 33].

Hanson’s Schema

Some surprising, astonishing phenomena p_1, p_2, p_3, \dots are encountered.

But p_1, p_2, p_3, \dots would *not* be surprising where a hypothesis of H 's type be obtained. They would follow as a matter of course from something like H and would be *explained* by it.

Therefore there is good reason for elaborating a hypothesis of the type of H ; for proposing it as a possible hypothesis from whose assumption p_1, p_2, p_3, \dots might be explained.

Darden bids of the abducer to analogize. Hanson bids him to reason from types. As it happens, there is a ready-built theory of analogical argument that gives instruction on both these matters. It is the Meta-Argument Theory of Analogical Argument (*MATAA*) originated in "Parity of Reasoning."

2. *The Meta Approach*

Consider (again) what may have been one of the most commented-on analogical arguments of the century just passed [Thomson, 1971, p. 49].

You wake up in the morning and find yourself back to back in bed with an unconscious violinist. A famous unconscious violinist. He has been found to have a fatal kidney ailment, and the Society of Music Lovers has canvassed all the available records and found that you alone have the right blood type to help. They have therefore kidnapped you, and last night the violinist's circulatory system was plugged into yours, so that your kidney can be used to extract poisons from his blood as well as your own. The director of the hospital now tells you, "Look, we're sorry the Society of Music Lovers did this to you — we would never have permitted it if we had known. But still, they did and the violinist now is plugged into you. To unplug you would be to kill him. But never mind, it's only for nine months. By then he will have recovered from his ailment and can safely be unplugged from you." Is it morally incumbent on you to accede to this violation? No doubt it would be very nice if you did, a great kindness. But do you *have* to accede to it? What if it were not nine months, but nine years? Or longer still? What if the director of the hospital says, "Tough luck, I agree, but you've now got to stay in bed with the violinist plugged into you, for the rest of your life. Because remember this: All persons have a right to life, and violinists are persons. Granted you have a right to decide what happens in and to your body, but a person's right to life outweighs your right to decide what happens in and to your body. So you cannot ever be unplugged from him."

Thomson develops her analogical argument as follows. If you judge *The Violinist* to be a good argument, then there is another argument similar to *The Violinist* that, by parity of reasoning, you must also judge good. This other argument (call it *The Pregnancy*) is one that concludes that maintaining a pregnancy arising from rape is not morally obligatory. Thomson is here invoking, without naming it, the *Fundamental Rule of Analogy*, which requires that similar cases be treated similarly.

What the Fundamental Rule does not make clear is what the relevant similarities between *The Violinist* and *The Pregnancy* would consist in. This is answered by the Meta-Argument Theory of Analogical Argument. It would be well to bear in mind at this juncture that Darden's schema has the reasoner *generalizing* and Hanson's schema has the reasoner arguing from *type*. So consider the following schema, which we'll call *The Generalization*.

The Generalization

Human beings H_1 and H_2 are so related that without H_2 's consent, H_1 has placed H_2 in a state of vital dependency;

the period of dependency is indeterminate (perhaps nine months, perhaps nine years, perhaps forever).

the dependency is a grievous impediment both to locomotion and to (stationary) mobility;

the dependency constitutes a grievous invasion of privacy;

it is an invitation to social disaster, for H_2 (and H_1 as well) is a laughing stock,

it threatens H_2 's economic self-sufficiency;

therefore, it would be morally permissible for H_2 to terminate the vital dependency.

Suppose, for present purposes, that Thomson is right in claiming parity between *The Violinist* and *The Pregnancy*; then *MATAA* furnishes the answer to what it is that these two quite different arguments nevertheless have in common. The *MATAA* proposal takes seriously the mention of cases in the *Fundamental Rule* to treat similar cases similarly. Accordingly, it is proposed that what *The Violinist* and *The Pregnancy* are cases of is a common deep structure represented here by *The Generalization*. Thus an analogical argument is a meta-argument; it is an argument about arguments. It is an argument in the form

Meta-Argument

1. Argument A possesses a deep structure that provides that the premisses of A bear relation R to its conclusion.
2. Argument B shares with A the same deep structure.
3. Therefore, B possesses a deep structure that provides that its premisses likewise bear R to its conclusion.
4. Hence, B is an analogue of A , A and B are good or bad arguments, by parity of reasoning, so-called.

In our example, argument A is *The Violinist*. R is a strong consequence relation. B is *The Pregnancy*. The deep structure is *The Generalization*.

The *MATAA* analysis requires that the analogizer generalize on an argument whose assessment is already settled, and then instantiate to a different argument. To achieve the desired parity, it is essential that the property that the original argument is assessed as having (e.g., validity) is preserved by the generalization and preserved by the subsequent instantiation (Darden calls this "particularization"). It is well to note the significance of target property-preservation. For ease of exposition let us agree to denote by P that property of *The Violinist* in virtue of which we regard it as a successful argument (assuming that we do). Then if the move from *The Violinist* to *The Generalization* is P -preserving and the instantiation from it, in turn, to *The Pregnancy* is also P -preserving, then one cannot in strict consistency ascribe P to *The Violinist* but not to *The Pregnancy*. This is important. It shows that good *MATAA* reasoning makes it a requirement of consistency that *The Pregnancy* be given the identical evaluation as *The Violinist*, contrary to Guarini's reservations. But let us also note in passing that this is not at

all the same as holding that one cannot in strict consistency accept the premisses of *The Pregnancy* and withhold or reject its conclusion. For nothing requires that the P that gets preserved in successful *MATAA* reasoning is always the property of validity. Perhaps this is the source of Guarini's confusion.

3. *Abduction*

How does this bear on abduction? In a typical case the abducer has a target T for which he seeks an H such that for his belief-set Δ , $\Delta \cup \{H\} \circ \rightarrow T$. His principal task is to find the requisite H . By Darden's and Hanson's lights, the abducer reasons his way to H by analogy. Doing so involves generalization and instantiation, and reasoning from type. If he proceeds in the manner prescribed by *MATAA*, the abducer looks for a distinct consequence structure

$$1. \quad \Delta^* \cup \{H^*\} \circ \rightarrow T^*$$

that generalizes to

$$2. \quad \Delta' \cup \{H'\} \circ \rightarrow T'$$

in ways that preserve the truth of (1). A Condition on this generalization is that the target T' of the abducer's present abduction problem instantiate the T of the generalization of the original consequence structure. He then instantiates from Δ' and H' to the required Δ and H . What this represents is a rather commonplace situation in which there is a conclusion that you want to find some justification for. This is a premiss-selection task. You look for a conclusion whose sole similarity to your intended conclusion is that it is justified by premisses of a type (Hanson) that would likewise justify your intended conclusion. So you look for the requisite similarities among putative premisses.

Except for tightly circumscribed situations, there are no algorithms for this that abducers actually execute. On the other hand, the *MATAA* has some powerful advantages. One is that it reduces analogizing to target property-preserving generalization and instantiation, which, given their commonness is a significantly simplifying reduction. The other that it gives some content to the schematic insights of Darden and Hanson.

But what of Guarini's other reservations, especially those that bear on the question of obscurity or under-exposition? The answer is that in neither the original paper of 1990 nor in this note have I explained the notion of deep structure and the relation of being-a-case of. Clearly, the familiar quantifier rules of the predicate calculus tell part of this story. Attempts to tell the other parts may be found in due course in *The Reach of Abduction*, which Dov Gabbay and I are in the midst of writing (Gabbay and Woods, 2004).

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