

From loci to critical questions: an AMT approach to argument evaluation. Insights from the domain of corporate controversies.

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Abstract

In this paper, I propose a method for determining and formulating critical questions based on the Argumentum Model of Topics (AMT). Following AMT, an argumentative inference includes a topical dimension, based on loci and maxims, and a contextual dimension, based on data and endoxa. Accordingly, three types of critical questions are distinguished, depending on which premise is targeted (datum, endoxon or maxim), which offers an enhanced understanding of the ARS concept (acceptability, relevance, sufficiency). The formulation of locus-specific critical questions is based on the call-out of the antecedent of the maxim's conditional premise underlying the argument under evaluation. The proposed approach is illustrated with an example of pragmatic argumentation in the domain of corporate controversies.

Keywords

Acceptability, relevance and sufficiency (ARS), argument evaluation, Argumentum Model of Topics, critical questions, financial communication, inference, loci, topoi.

1. Introduction

In this paper, I will lay the foundation for an approach to argument evaluation based on the Argumentum Model of Topics [14] integrated with critical questions. The use of critical questions for evaluating arguments has a long tradition that finds its origins in dialectical approaches and important development in fields like law, AI and several others.

Critical questions constitute a well-known method of argument evaluation that is based on the properties of the argument scheme underlying the reason-to-claim relation. As several argumentation scholars have explained, to each argument scheme a list of critical questions is associated which a critical analyst or audience should ask in order to evaluate the cogency of an inference as instantiated by a particular contextualised argument. Evaluating the cogency of an argument, as [4] suggest, coincides with determining its acceptability, relevance, and sufficiency (ARS or RSA).

A well-known example is Walton's list of six critical questions to the argument scheme from expert opinion [18]:

1. Expertise Question: How credible is E as an expert source?
2. Field Question: Is E an expert in the field that A is in?
3. Opinion Question: What did E assert that implies A?
4. Trustworthiness Question: Is E personally reliable as a source?
5. Consistency Question: Is A consistent with what other experts assert?
6. Backup Evidence Question: Is E's assertion based on evidence?

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This list – and similar lists for other schemes – have been the object of repeated criticisms (e.g., [6], [1], [21]). For example, CQ6 might be problematic for assessing an appeal to expertise as it would count as a rejection of the appeal altogether. As a matter of fact, a precise and systematic method by which critical questions are defined and can be formulated has not been provided so far. Available lists of critical questions such as the one just shown (e.g., [19]) appear at least in part intuitive and – I argue – not always exhaustive and consistent. Indeed, there is still a lack of clarity and a good deal of scholarly discussion on the very nature of critical questions, how they are generated and formulated, and how they should be used when embarking on the critical evaluation of an inference.

In this paper, I will try to address these issues by proposing a method for determining and formulating critical questions based on the Argumentum Model of Topics - or AMT [14]. Leveraging on a theory of loci (or topoi), the AMT provides with an analytic framework for reconstructing the inferential configuration of an argument in *context*. With the aid of a simple example, I will first review the fundamental components of the AMT analysis (section 2) and show how it can support argumentative evaluation by means of critical questions (section 3). Subsequently (section 4), I will focus on the AMT notions of *locus* and *maxim* and explain how critical questions can be derived from them. I will do so by examining an example of pragmatic argumentation in the domain of corporate controversies. Section 5 concludes with open questions for future research projects.

2. AMT inferential analysis: The Carbonara example

To briefly recap the AMT inferential analysis, I will examine a simple and quasi-real example of dialogic argument that I have been frequently using in my argumentation courses in different countries. My students know it as the *Carbonara example*. The setting is an Italian family’s house in the UK on a Sunday morning and involves Vito as the protagonist and his four children (Betty, Titus, Tommy and Emanuel) as antagonists. After Vito rejects his children’s request to prepare *Spaghetti alla Carbonara* (one of the most well-known and delicious pasta recipes from the Italian cuisine), Titus reacts critically by asking why this is not possible, thus challenging Vito to justify his claim. Vito responds firmly with a single argument: “There is no bacon left”.

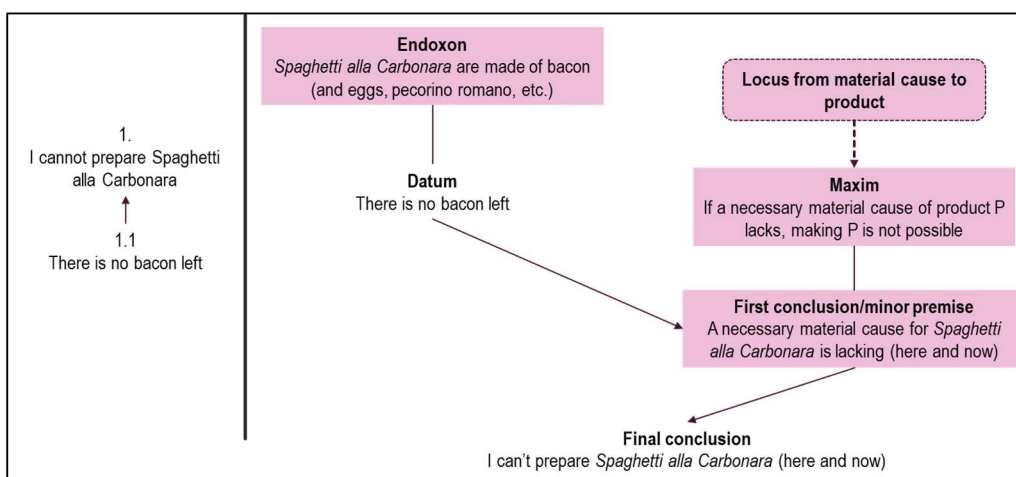


Figure 1: AMT’s inferential analysis. The Carbonara example.

Figure 1 shows the basic macro-structure of this argument and the full inferential configuration (micro-structure) diagrammed according to the AMT model. Following AMT, an argumentative inference includes a topical dimension, based on context-independent loci and maxims, and a contextualised dimension, based on situation-related data and culture/domain-

related endoxa. The datum (“there is no bacon left”) and the final conclusion (“I can’t prepare Spaghetti alla Carbonara”) coincide, respectively, with the expressed premise (1.1) and the standpoint (1.) in the macro-structure analysis.

The type of reasoning (locus/topos) made by Vito puts into relation a food product (Carbonara) and an ingredient this product is made of (bacon). We can call this locus ‘from material cause to product’. In the AMT theory, each locus (e.g., definition, material cause, end-means, alternatives, authority, etc.) generates a set of maxims.

A maxim is a *conditional premise* [11] that uses the generic categories of the locus (e.g., material and product) to establish a context-independent inferential rule like, in this case, the principle stating that ‘If a necessary material cause of product P is absent, P cannot be made’. The maxim works as a major premise of a syllogism that concludes with the standpoint through a minor premise (‘a necessary material cause for Spaghetti alla Carbonara is absent’). The latter, unlike the maxim, is a context-dependent premise. Indeed, it mentions Carbonara, not a generic product, and it refers to the particular situation the arguers are referring to (the absence of bacon at a family’s home on a Sunday morning). Therefore, this minor premise cannot be derived from the locus, but from the context of the argumentative exchange. More specifically, it is based on the (alleged) fact that bacon is not available (datum) and on the cultural assumption (endoxon), that *Spaghetti alla Carbonara* are made with bacon (besides eggs, Pecorino cheese, etc.). While the datum refers to a circumstance featuring in the particular situation the argument is part of, the endoxon refers to the protagonist and antagonist’s common ground, appealing to the common knowledge, opinions and values of the socio-cultural context they belong to (the Italian food culture in this case).

3. Applying critical questions onto the AMT analysis

The AMT inferential analysis represents a useful starting point for a critical assessment of the argument. The idea of applying critical questions onto the AMT’s Y-shaped diagram was already suggested in earlier works [13, 15], but never developed systematically. Here, I suggest to distinguish four types of critical reactions that target the final conclusion, the datum, the endoxon and the maxim, respectively. These four critical reactions correspond to the four types of refutations or counterarguments that have been distinguished in the literature: (i) rebuttals, which attack the standpoint; (ii) underminers, which attack the datum; (iii) undercutters of relevance, which attack the endoxon, and therefore the relevance of the datum; (iv) undercutters of sufficiency, which attack the maxims, and therefore the sufficiency of the datum (see [9]).

Table 1. Critical questions and refutations. The Carbonara example.

Target of the attack	Critical question	Type of refutation	Counter-argumentation	
			Counter-claim	Counter-reason
<i>Standpoint</i> (I can’t prepare Carbonara)	Why could you not prepare Carbonara?	Rebuttal	No, you actually can.	Mum said so.
<i>Datum</i> (Bacon is absent)	Is bacon really absent?	Underminer	Bacon is not absent	I’ve just checked the fridge and we have it.
<i>Endoxon</i> (Carbonara is made with bacon)	Is bacon an ingredient of Carbonara?	Undercutter (relevance)	Carbonara isn’t made with bacon	Carbonara is made with <i>guanciale</i> .
<i>Maxim</i> (if MC is absent, P can’t be made)	Is the absence of MC enough to infer that P can’t be made?	Undercutter (sufficiency)	It doesn’t mean we can’t prepare it	We can easily get bacon at the fuel station nearby

Indeed, refuting an argument presupposes its critical evaluation and implies the justification of a claim that is contrary to one of the elements of the attacked argument [16]. A critical reaction can limit itself to asking a critical question, and thus casting doubt on a particular argumentative element, or go further by “answering” the critical question to refute, and possibly defeat, the questioned argumentation [17].

Going back to the Carbonara example, let us consider the four critical reactions that each of Vito’s children can raise against their dad’s argument to identify the critical questions underlying each criticism. Let us imagine that: Emanuel uses a rebuttal to deny the standpoint (it is not true that you can prepare Carbonara); Tommy uses an underminer to deny the datum (it is not true that bacon is absent); Betty uses an undercutter-relevance to deny the endoxon (bacon is not an ingredient of Carbonara); Titus uses an undercutter-sufficiency against the maxim (if not immediately available, the material cause can be easily obtained elsewhere).

3.1. Critical questions to the contextual premises

Focusing on the attacks to the reason (underminers and undercutters), two sets of critical questions should be distinguished from an AMT perspective:

1. Critical questions to the contextualised premises (datum and endoxon)
2. Critical questions to the maxim

The first set of critical questions casts doubt either on the acceptability or on the relevance of the expressed premise (datum), where its relevance coincides with the acceptability of the (normally unexpressed) endoxon. In the Carbonara example, Tommy critically asks whether the claimed absence of bacon is really the case. His criticism can go further and refute the datum, thus undermining the argument, by pointing to the actual presence of bacon as made evident by a quick personal check of the fridge. By questioning the endoxon, instead, Betty shows indifference towards the presence or absence of bacon, as this would be irrelevant if it is established that the Carbonara’s recipe does not include bacon. Indeed, according to many Italian people, Carbonara should be made using *guanciale* rather than bacon. If this revised endoxon is accepted (‘Authentic Carbonara is made with guanciale, not bacon’), the truth value of the datum becomes meaningless, as the presence of a different ingredient would need to be verified.

3.2. Critical questions to the maxim

The second set of critical questions requires a more extensive elaboration and will be the focus of the remainder of this paper. What happens when Titus replies to his dad “well, we can easily get some bacon at the fuel station nearby”? We observe that neither the datum nor the endoxon are questioned. Titus seems to trust his dad accepting that bacon is unfortunately absent (datum). He is also not bothered too much about Italian traditions, looking pretty fine with the idea of cooking Carbonara with bacon (after all, some historians even claim that bacon was the original ingredient as it was brought to Rome by US soldiers during the Second World War [2]). The critical point made by Titus refers to the condition set by the underlying maxim: is the absence of the material cause sufficient to draw the conclusion that the product cannot be made? Evidently, by counter-arguing that bacon can be easily obtained at the nearby fuel station, Titus refutes (and actually defeats) his dad’s argument showing that the absence of bacon in the house is a true, relevant but not sufficient condition for the truth of the standpoint.

In order to better understand the mechanism behind this particular type of critical reaction, we need to clarify the nature of maxims in the AMT theory. Loci are ontological relations while maxims are conditional premises that connect two or more elements of the ontology the locus is

based on. For example, the locus from material cause to product presupposes the ontology of a physical object and entails several maxims like ‘if the material cause has feature f, the product has f’ or ‘if the material cause is absent, the product cannot be made’. Some loci entail bi-conditional maxims which activate deductively valid reasons. A typical example is the locus from definition-to-defined and its maxim ‘if and only if the definition applies to X, the defined applies to X’. However, most maxims are only presumptive as they select and foreground specific elements of the locus, while presuming other elements of the locus, which are left in the background as *ceteris paribus* conditions [20]. Indeed, a more accurate formulation of the maxim would be ‘other things being equal (*ceteris paribus*), if the material cause is absent, the product cannot be made’.

To question the sufficiency of an argument amounts to asking to verify whether such *ceteris paribus* conditions are indeed met. In the Carbonara example, Titus’s objection points to an element of the relation between possessing the material and preparing a product which was left tacit: to make the preparation of a product possible, one needs to either possess the material or have immediate availability of it (i.e. getting it without significant extra efforts). If made explicit, this element would form a more exhaustive maxim, i.e. an inferential rule where a lower number of *ceteris paribus* conditions are presumed: ‘other things being equal (*ceteris paribus*), if the material cause is absent and cannot be easily obtained, the product cannot be made’. The task of an argument evaluator (be it the antagonist in a critical discussion or the external analyst) is precisely that of asking and verifying whether these implicit conditions are met or not.

Therefore, critical questions should be understood as challenges to the *ceteris paribus* conditions of the maxim deployed and, as the next section will explain, they can be formulated as the interrogative form of the antecedent of the presumed maxim. Following this approach, evaluating an argument does not consist in the discussant’s purely intuitive creation of objections, but in a much more disciplined discovery and identification of maxims based on a rigorous examination of the locus at work. In this perspective, loci (topoi) regain their original heuristic function, assigned to them in Classical Rhetoric [12]: they are a method for finding arguments and, as in this case, counter-arguments.

This view implies that loci are neither context-related nor subjective, even though arguers can have a subjective understanding of them. It is well possible that arguers fail to recognise the structure of a locus in full, but this is a matter of knowledge, not of subjective opinion. This marks a stark difference between loci/maxims and endoxa. Disagreement over endoxa is possible and, in fact, can occur frequently (e.g., people may disagree on which ingredients are the best for a Carbonara), leading to sub-discussions over starting points [5] that are typical of intercultural communication. Disagreement over loci and maxims would instead lead to meta-discussions regarding human reasoning. In other words, if arguers cannot find agreement over endoxa (and data), their discussion will not succeed in resolving the issues, whereas unsettled disagreement over loci and maxims hinders the very possibility of having a reasoned discussion.

4. Critical questions to pragmatic argumentation: an example from the domain of corporate controversies

In order to showcase how to derive maxims and critical questions from the semantics of the locus, I will focus on an example of pragmatic argumentation in the domain of corporate controversies. Public disputes over strategically important corporate decisions are a precious context to investigate how multiple actors (stakeholders) debate a course of action in its different constitutive aspects. For reasons of space, in this paper we limit the analysis to one single episode, forwarding the examination of entire case studies to an extended version of this paper.

The episode, which has been analysed more extensively in [8], refers to an open letter that activist investor Carl Icahn sent to the CEO of Trump Entertainment Resorts, Bob Griffin. The company was in serious financial trouble and Carl Icahn was asked for a \$100ml support. Icahn was reluctant to accept unless a deal was struck with the political authorities for a tax break and with the union for employees to join the Obamacare health insurance scheme. In his letter, published on his website *The Shareholders Square Table*, Icahn pursues the complex rhetorical exigence of persuading different audiences (investors, managers and social stakeholders) to accept a compromised proposal: injecting only \$20million, rather than the requested \$100ml, to maintain the company alive while trying to find an agreement with the union and the political leaders. The following excerpt represents the heart of Icahn’s complex practical reasoning:

"Many people would still argue that it would be a better financial decision for me to let the Taj close and wait to see whether a global settlement can be reached. But I cannot be so callous as to let 3,000 hardworking people lose their jobs [...] Therefore, [...], I will send you a commitment letter to provide you with up to \$20 million of additional financing [...] (quoted in [8]).

As the connective “But” indicates, Icahn justifies his decision with a refutation of an argument that would lead to the opposite conclusion. The attacked argument, presumably attributed to the investor community (“Many people...”), states that Icahn should refuse Griffin’s request and let the company fail, since supporting it would be financially imprudent. It is an argument based on the locus from final cause (goal to action), which appeals to an endoxon that is typically shared within the financial community: maximising profit is the primary goal of financial investments.

In order to understand Icahn’s refutation and how to obtain the critical question underlying his criticism, we need to analyse the ontology of human action which underpins the locus from final cause and similar loci of practical reasoning. Figure 2 reports the schematic representation of the ontology of human action, based on Rigotti’s work [13]. Each element of this ontology can be related to one another to generate loci and maxims. Typical action-related loci are final cause, alternatives, termination/setting up [14].

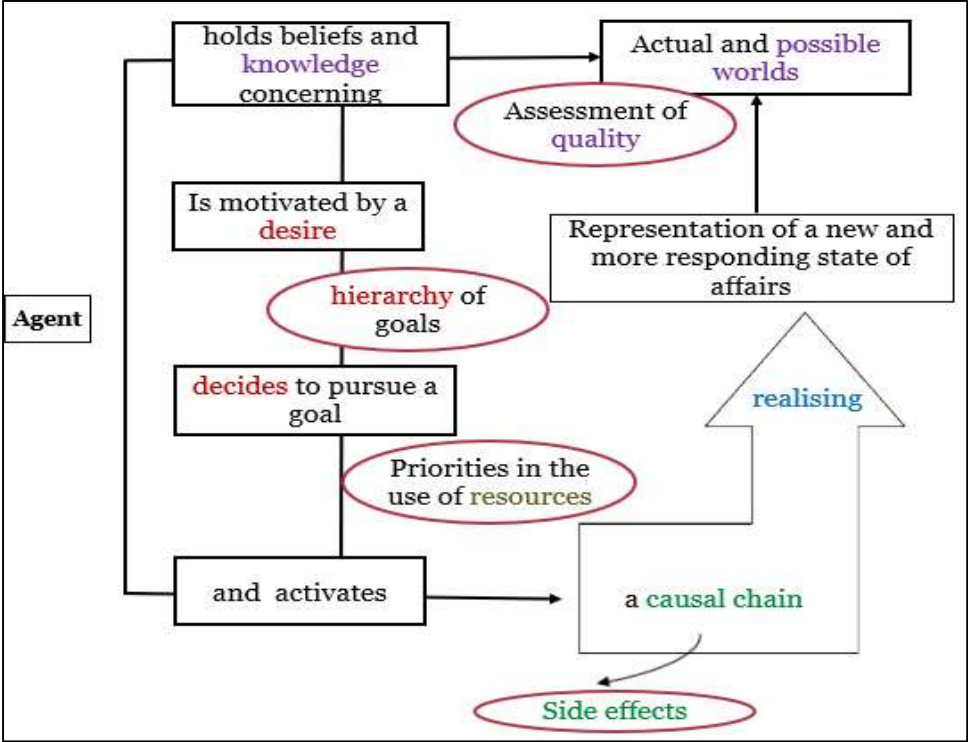


Figure 2. The ontology of human action ([13], [9])

Without claiming exhaustiveness, Table 2 lists a set of maxims that can be derived from this ontology and the corresponding critical questions, which are obtained by transforming the antecedent of the maxim into an interrogative sentence and calling it out.

Table 2. From loci and maxims to critical questions

Ontological factors	Maxim	Critical question
Possible worlds and goal	1. If goal G is a desirable possible world for agent A, A pursue G.	Is G desirable for A?
Goals and their hierarchy	2. If pursuing goal G prevents agent A from realising a more important goal, A should renounce to G.	Would G prevent A from realising a more important goal?
Goal, actions and resources	3. If the resources used to activate an action A cannot be used for an action serving a greater goal, the action should be renounced to.	Can the resources used to activate A be used for an action serving a greater goal?
Side effects and action	4. If the side effects of an action outmatch its expected benefits, the action should be avoided.	Do the side effects of A outmatch the expected benefits?
Alternative actions, goal and resources	5. If two alternative actions for the same goal are available but one costs fewer resources, this one should be chosen.	Is there an alternative action that costs fewer resources?
Action, outcome and termination	6. If the goal of Agent A is better served by terminating a present state of affairs S rather than keeping it, A should terminate S.	Does the termination of S lead to a better outcome?
Possible worlds, desires and setting up	7. If a possible world is desirable, it should be set up.	Is this possible world indeed desirable?

The maxim underlying the argument attacked by Icahn is number 6 in the table. Figure 3 diagrams the whole inference indicating examples of critical questions that can be made against the contextual premises and the maxim.

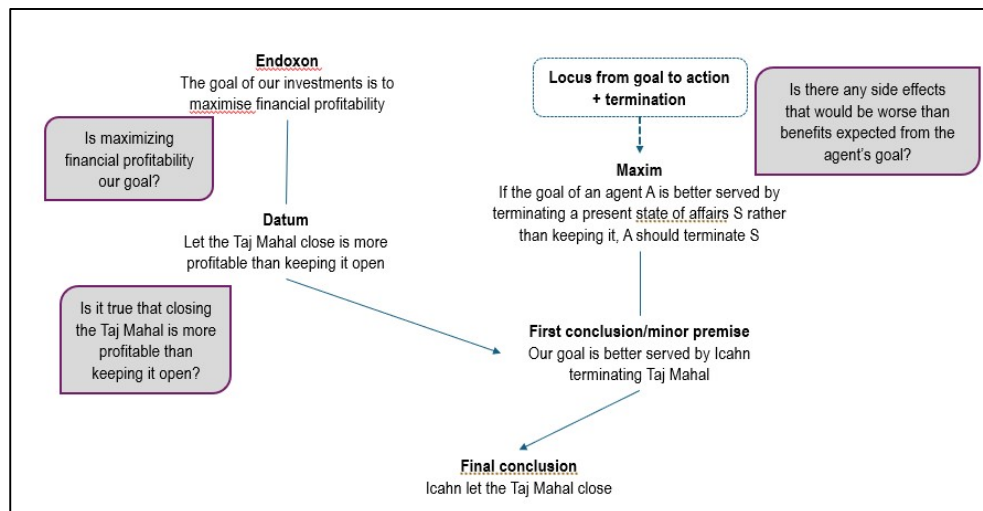


Figure 3. AMT analysis of practical argumentation with critical questions

Note that even the critical questions targeting the contextual premises can somehow be related to the locus and the maxim. Indeed, the endoxon identifies the main elements of the locus in the particular context at issue (i.e. it tells us who the agent is and what the goals are in our case); the datum affirms the antecedent of the maxim with contextualised information (i.e., it

tells us that *this specific* goal is better served by terminating *this specific* situation). However, critically asking whether these two propositions are true or false is not a locus-specific question. In other words, the contextual critical questions apply indistinctively to all loci and inferential configurations.

Going back to our example, the refutation made by Icahn is an undercutter of sufficiency that points to the side effects of the proposed termination: 3,000 employees would lose their job. Icahn is appealing to maxim 4 in the table ('if the side effects of an action are worse than the expected benefits of the pursued goal, the action should not be undertaken') and the critical question it entails ('are the side effects worse than the expected benefits?').

While the antecedent of the maxim provides with a critical question, the full maxim statement provides with a criterion to establish "the stronger" argument, i.e. an undercutter-defeater [10]. The statement "I cannot be so callous" entails that the damages of this side effect are judged as worse than the financial benefits that would be gained if the company is let down. In other words, Icahn does not only point to the insufficiency of the investors' arguments (the side effects have not been accounted for), but also offers a counter-argument that defeats the original argument. In fact, the endoxon is not denied but expanded: making profit is the primary goal of investors provided that the financial intervention does not damage employees to a substantial level. Icahn stresses his commitment to employment ("I cannot be so..."), appealing to the solidarity of investors who are invited to recognise this social concern and integrating it into their value system (endoxon). By completing the maxim with the aspect of the locus that Icahn has highlighted (side effects), the original inferential principle clearly becomes a relevant but insufficient condition for the concluding standpoint.

5. Conclusions

In this short paper, I have proposed an approach to the identification and utilisation of critical questions based on the Argumentum Model of Topics. Two sets of critical questions are distinguished accordingly: those targeting contextualised premises (endoxon and datum), which enable to assess the acceptability and the relevance of an argument; and those pointing to the exhaustiveness of the maxim, which enable to assess the sufficiency of an argument.

I proposed to define critical questions starting from the semantic analysis of the locus, i.e. the ontology from which maxims are derived. Accordingly, the formulation of a critical question against the maxim coincides with the interrogative form of the antecedent of any other maxim from the same locus. From this perspective, critical questions should not be interpreted as the reflection of an antagonist's merely subjective expressions of doubt, but as the result of a (more or less aware) critical examination of the semantic structure of the locus that governs the issue under discussion.

A future larger research project is required in which a rigorous analysis of each locus is made in order to systematically derive (near to) exhaustive lists of maxims and corresponding critical questions. Such work would have important implications for computational argumentation research too. For example, the systematic compilation of locus-related maxims and critical questions could inform the elaboration of analytic tools that automatise or semi-automatise the evaluation of arguments in context.

Future work can also exploit the insights of this paper to advance theories of counter-argumentation. In this short paper, I have just hinted to the idea that loci and maxims not only generate critical questions but also supply the criterion to establish whether a counter-argument only deletes the attacked argument or even defeats it, resulting in an automatically rebutted standpoint.

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