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In this paper I am developing the theses that argumentation is a means for extending knowledge. The theses are founded on two focal points:1. Reasoning is designed for argumentation, and 2. Argumentation process is an exceptionally successful media that provokes usage of methods reliable for the extension of knowledge. The first point relies on Sperber's and Mercier's evolutionary psychological approach to argumentation which I consider the most convincing theory in the field. Taking this ground as a departing point, the goal of the paper is to broaden this approach with epistemological insights that I base on Williamson's safety theory of knowledge.

Keywords: Argumentation, evolutionary psychology, knowledge, safety.

In this paper I am going to combine two apparently distinct approaches to argumentation. The first one is an evolutionary psychological approach to argumentation while the second is a rather highly theoretic epistemic understanding of knowledge. I am going to argue for the claim that the argumentation process is a particularly good means for the extension of knowledge. Also, there are two focal points around which the paper is organised. The first point is

a) The function of reasoning and the nature and the structure of the argumentative process, while the second is
b) Argumentation process as an exceptionally successful media that provokes usage of methods reliable for the extension of knowledge.

Concerning the first point, Dan Sperber and Hugo Mercier do excellent work in a series of articles. In their valuable contribution to the cognitive science, their naturalistic, evolutionary-oriented theory develops and explains the topic of my first point. Their great result contributing to the cognitive science is their explanation of the relationship between

inference and argumentation.[1] They have shown convincingly that reasoning is evolutionally designed for argumentation, more precisely, "that reasoning is best adapted for its role in argumentation, which should therefore be seen as its main function" (Mercier and Sperber 2011: 59). When a reasoning mechanism, they argue, is employed to do what it is designed to do—finding and evaluation of reasons through argumentation—it works well and produces good performance. In this paper I will heavily rely on their results but also extend their evolutionary approach offering an epistemic contribution to the naturalistic theory of argumentation.

To connect evolutionary cognitive theory of argumentation and argumentative process' aptitude for the extension of knowledge, I need a suitable epistemological theory. The epistemological theory I am endorsing here and the notion of knowledge it develops perfectly suits my purposes. The theory I am going to employ is Timothy Williamson's highly innovative epistemological theory (2000, 2009), which bases the notion of knowledge on the safety principle. I will explore Williamson's *safety* theory in its general form as the theory of *safe knowledge*, but also in its dynamic aspect accounting for the process of *safe derivation*.

My basic idea, combining these two approaches, is to show that the argumentation process naturally guides participants to extend their knowledge given that a) reasoning has a biological function to work optimally in argumentation, and b) that the very argumentative process is structured so that it optimally supports participants' epistemic curiosity to acknowledge whether a proposition P (the object of discussion) is true.

Let me take my starting point at two statements emphasised by Sperber and Marcier. Supporting their theses with a great number of research, they claim:

1. Advantage of group reasoning theses (AGRT): Groups do better at reasoning tasks than individuals, and, in some cases, do even better than *any* of their individual members (occasionally even better than their best member).

An effective account for this asymmetry between individual and group performance is:

2. Evolutionary thesis (ET): reflective reasoning has been designed by evolution as a communicative competence (rather than aiming at enhancing individual inference).

They claim, more precisely "that reasoning is best adapted for its role in argumentation, which should therefore be seen as its main function" (Mercier and Sperber 2011: 59). When a reasoning mechanism is employed to do what it is designed to do—finding and evaluation of reasons through argumentation—it works well and produces good per-

[1] See Mercier and Sperber (2011) and Sperber and Mercier (2012).

formance. My view concerning argumentation as a means for extending knowledge is quite in accord with these two claims.

Let me put forward some preliminaries. In a very general sense, I consider argumentation to be the most advanced form of communication in the sense that it requires participants' reflection and engagement of their inferential abilities in a much higher degree than it is the case in other forms of communication. I also understand argumentation as a social, two-sided (usually informationally asymmetric) temporal process in which two sides enter, each with some initial stock of beliefs, and through the process consisting of producing and evaluating arguments, each of them eventually reach the point where they know more than they did before.

It is important to emphasise here that as a central and important situation of argumentation I consider the case where addresser sincerely believes that P but does not know whether P. She has some initial beliefs about proposition P, but neither she nor the addressee still know whether P is true or false. I am arguing that *curiosity* whether P is true is, at lest implicitly, an important motive for entering the argumentation process. It might seem that the urge to convince the other side is the strongest motive in argumentation. But, it is hard to convince someone that P is true if it is not the case and the addresser is uncertain about that.

The basic form of curiosity in the argumentation process is whether a proposition P, relevant to the cognizer, is true or false. I am calling this type of curiosity *propositional curiosity*, in contrast to other types, such as the curiosity whether the bus will depart on time, or whether she is pretty as it is said. In the argumentation process, the propositional form of curiosity underlines all other curiosity forms. One might object that participants in the argumentation process can be, and often are, curious in a non-propositional way. For instance, one might enter the argumentation process just being curious whether he is good enough to win in a discussion. But, the discussion is always organized around a claimed proposition P. After all, the addresser, claiming that P, counts as a winner only if she has convinced the other side that P is true. Although the question of P being true or false at the beginning of the process might be non-existent for her, at some point in the argumentation process the question whether P is true will arise and become important. Both sides are propositionally curious whether P. But, I am arguing that the propositional form of curiosity is implicitly present as a motivating element. The propositional curiosity, which up to a certain point in argumentation was implicit, at that point turns out to be explicit and important.

Here is a rough idea about the structure of the argumentation process. Since the argumentation process is the most advanced form of communication, let us see how to get from communication to argumentation. Communication is a central form of social practice, which, be-

sides other purposes, has a goal of giving and receiving information. In a communication process one can be informed truly or be deceived. The advantage of true information is obvious as well as the danger of being misled. To judge the putative information correctly one should possess a number of cognitive abilities among which the inferential ability is one of the most important. To use Sperber's and Mercier's formulation, the inferential ability and its result, reasoning, is traditionally meant as "mental action of working out a convicting argument, the public action of verbally producing this argument so that other will be convinced by it and the mental action of evaluating and accepting the conclusion of an argument" (Sperber and Mercier 2011: 59).

Communication as a social practice is a process in which the informer claims a statement (conveys a piece of information) and an addressee evaluates the acceptability of the conveyed information. The information we are interested in might have a form of a sentential claim that something is the case (that P). The informer is claiming that P, while an addressee, on the other hand, evaluates (in most cases implicitly, intuitively) the acceptability of the claim. In such a simple communication process, the addressee evaluates the trustworthiness of the source and checks the consistency of the content of a claim with her previously held beliefs. It is hard to believe that one will blindly trust the source. Rather, the degree of trust depends on the context, the addressee's interest and the relevance of information.

However, human communication is usually not as simple as it is stated. In human communication, participants usually not only give and receive information but the addresser also offers supporting reasons or good ground for her claim. The addressee not only evaluates the trustworthiness of the source and the consistency of the content of a claim with her other beliefs, but also the connection between the reason and the claim. Here the reasoning, as the ability for producing arguments and evaluating them, comes into play. *It is the form of communication consisting of the claim, reason(s) (or evidence) supporting it and the relation between the claim and the reasons, where the addresser produces a claim and reasons while an addressee evaluates it, that I will consider as argumentation.*

Now, we have a familiar structure. In such a simple argumentation situation the addresser claims that P and P is a proposition of the form "an object O has a property F". In support of her claim she provides reasons r_1, …, r_n. Claim-content P stands in a kind of consequential relation to r_1, …, r_n. The addressee evaluates the argument finding reasons–claim relation acceptable or refutable. In both cases one makes a decision whether to accept or refute the relation.

Let us take the central case of argumentation situation to be, as it has been mentioned, the one in which the addresser sincerely believes what she is claiming to be true (or highly probable) and has a good ground (according to her own lights) for it, while the addressee wants

to make an effort to find out whether this is the case. Each of the participants is primarily interested (curious) in the truth of the claim. The addressee wants to avoid false beliefs by hypothesis, while the addresser, sincerely believing that P is committed to the belief that belief in P is true (because P implies that P is true).[2] This is the argumentation format I am interested in, letting aside other possible argumentation situations. The stipulation that each participant is primarily interested in the truth of the claim is to be examined in more detail.

In their attempt to convince other, people actually tend to neglect the objective search for the truth and "they are typically looking for arguments and evidence to confirm their own claim, and ignoring negative arguments and evidence unless they anticipate having to rebut them" (Mercier and Sperber 2011: 63). *The confirmation bias,* Mercier and Sperber claim, "is a feature of reasoning when used for the production of arguments" (Mercier and Sperber 2011: 63). Namely, given that addresser, believing (and claiming) that P is committed to the belief that a belief in non-P is false (for P implies that P is true), has no motivation to find out whether P is false. The confirmation bias has been detected as a common fallacy in individual reasoning or in reasoning with like-minded peers. In the argumentation process, the confirmation bias leads participants to reinforce their initial beliefs producing individual polarization. Nevertheless, I will try to show that the argumentation process has resources to remedy the confirmation bias.

Tim Williamson depicted the bias in a stronger form: "One is bound to think any given belief of his own superior in truth-value to the contrary beliefs of others" (Williamson 2007: 247). Fortunately, Williamson offers a remedy that nicely fits my approach. He says:

> But sometimes we step back of our beliefs and regard them as psychological phenomena on a par with the belief of others, in equal need of both psychological explanation and epistemological criticism. (Williamson 2007: 247)

I will try to show that the argumentation situation is exactly the situation that prompts one to "step back" in the described way. Furthermore, I will argue that the very argument structure has the effect of prompting participants to "step back" and that this very structure enhances participant's inferential abilities.

This *stepping back* provides additional motivation for the addresser to evaluate her own beliefs as well as her inferential steps. If it were the case it would be plausible to suppose that firstly, participants are interested in the truth and, secondly, that applying the appropriate notion of knowledge, it would be plausible to show that the argumentation process is a good means for the extension of knowledge. Let me first offer an account of how argumentation enhances individual reasoning abilities and therefore increases the chances for reaching the truth.

[2] It is of course possible that the addresser does not believe that P is true (sincerely believes that P is false) and still wants to deceive the addressee that P is the case, but I am not counting this situation as an argumentation process.

Just as the tendency to commit confirmation bias is a natural tendency in reasoning, the argumentation process has powerful resources for *de-biasing* the bias. The integral part and an important feature of the argumentation process, detected by Sperber, is the 'epistemic vigilance' of participants (Sperber et al. 2010). Participants in an argumentation are likely to display a higher degree of epistemic caution, to be epistemic vigilant, more that it would be the case in individually acknowledging the true state of the affair. This notion of 'epistemic vigilance' is based on the importance of getting the true information and avoiding the false one.

The possible explanation for such articulated epistemic vigilance lies, I suggest, in the *difference in roles* participants may play in the argumentation process. The epistemic status of the addresser and the epistemic status of the addressee points to quite different roles of each of the two in the argumentation process. The role of the addresser is to claim that P and to provide (or make explicit) the reasons that support the claim. As we said before, the addresser is inclined to provide more and more reasons for her claim. Concerning this tendency, empirical investigations report about a strong *confirmation bias* in the argumentation. It should be noted, however, that participants might switch their roles in the process. At the same time, in the role of the addresser, one is under obligation to display reasons for one's claim and to get them in the relation to the claim in a way maximally understandable and clear to the addressee. In other words, one will make it accessible/knowledgeable to the addressee as much as possible. Here is how Dan Sperber describes the process:

> One way to persuade one's addressees is to help them check the consistency of what one is claiming with what *they* believe, or even better if possible, to help them realize that it would be inconsistent with what *they already believe* not to accept one's claim. The communicator is better off making an honest display of the very consistency addressees are anyhow checking. This amounts to, instead of just making a claim, *giving reasons* why it should be accepted, *arguing* for it. (Sperber & Mercier 2012)

On the other hand, the role of the addressee is to evaluate the acceptability of P assessing the reasons and their relation to the claim. The addressee will do her best to find counterexamples to the addresser's argument and in this way falsify her claim, if possible. The role of the addressee thus creates a significant counterbalance to the confirmation bias the addressor is prone to. The fact that participants are committed to playing different roles and their different goals gives the argumentation process the power to add something to the extension of knowledge. Let me elaborate a little. The participants in the argumentation process are individual reasoners with their reasoning competences and abilities as well as their practical and epistemic goals. Let us take, to reiterate, a simple argumentation situation in which one party is claiming that P and the other party is suspicious whether this is the case.

Taking that the addresser sincerely believes that P is true while the addressee does not want to be misinformed and led astray, they, obviously, enter the process with different, even opposing goals. There is, on the one hand, a practical goal of convincing one, and also a practical goal to avoid misinformation, on the other. But, it seems that behind these practical goals, there is a more fundamental one. I suggest that it is the epistemic goal of acquiring knowledge. Each party is doing whatever is in their intellectual power to find out whether that which is claimed is true.

Here is a rough and overall description of the process. In argumentation, both the addresser (S) and the addressee (S') are involved in two distinct courses of action, producing the arguments and evaluating them, because of changing their roles in discussion. Production of the argument as an inferential action is naturally subject to the confirmation bias. The evaluation of the produced argument, on the other side, is not. It has an effect of de-biasing the process. These two inferential actions mutually support each other creating a method for broadening initial knowledge possessed by both participants.

This structural description, stated so far, obviously needs its dynamic part, the epistemic account for the advancement of knowledge in the process. I take the initial epistemic situation to be something like the following. Both parties have some initial knowledge concerning P that they arguing about. S sincerely believes P, but does not know whether P is true. Still, she does know some facts concerning P. S' is also acquainted with some facts concerning P, in less certain way then S. S' also doesn't know whether P. But, both of them, being involved in producing and evaluating arguments, are in a way forced to be curious, whether P.

Let me use an example. Poirot and his assistant, Colonel Hastings, investigate the case of a homicide. In this example, Hastings is the one who is proposing the solution. In the argumentation process, Colonel Hastings claims that it is the gardener who is the murderer and offers reasons. Reasons are based on the following evidence, i.e., there is the knife, which, beyond reasonable doubt, has been proven to belong to the gardener. There is victim's blood on the knife. The gardener has no alibi. Poirot might accept the evidence as sufficient for the conclusion or deny it evaluating the argument, re-examining evidences. He may point out to some equivalence unnoticed to the good colonel. Also, he can help him to recognize some obviousness the colonel did not recognize before. Poirot and Hastings have some knowledge about P, whether the gardener is a murderer, but do not have the knowledge whether this is true or not. Through the argumentation process they have to safely extend their initial knowledge in the way that, in the optimal case, they reach the point of *knowing* who the murderer is, or in the less optimal case, to know more than they did at the beginning of the argumentation.

Let me introduce the epistemic theory I find most appropriate. The epistemic theory that I take as suitable for the idea of extension of knowledge is Tim Williamson's knowledge theory based on the *safety principle*. Williamson's theory is one of the few notable attempts to improve Gettier's *justified true belief* theory of knowledge, and at the same time, to give an alternative solution to famous Nozick's *sensitivity* based theory. Due to space limitation, I am going to give a very sketchy presentation of Williamson's theory.

Avoiding formulating the theory in terms of necessary and jointly sufficient condition for knowledge, Williamson founded the model of knowledge in the concept of safe avoidance of error. Accordingly, S knows P only if S is safe from error. As Williamson stated: "If one knows, one could not easily have been wrong in a similar case" (Williamson 2000: 147).[3] Skipping the subtlety, I am going to maintain only those moments of the theory relevant for my purpose.

The cases or conditions important for determining the similarity can be determined by the set {S,M,P,T}, where S denotes a cognizer, M a method, P proposition and T a time in which S believes P. A further formulation is the following:

"In a case α one is safe from error in believing that (a condition) C obtains if and only if there is no case close to α in which one falsely believes that C obtains" (Williamson 2000: 126–7). A condition C is specified by "that" close relative to an agent and the time. In our Poirot example, C is the belief "gardener is a murderer".

Williamson tackles the concept of safety differently at different places, introducing the concept (together with concepts of "reliability and unreliability, stability and instability, safety and danger, robustness and fragility") he claims that they refer to modal states. They concern "what would easily have happened" (Williamson 2000: 123). In the epistemic situation safety is attributed to knowledge and belief. In such a situation what easily would have happened is the cognizer being wrong or right in respect to some proposition P. S's being right in a particular situation counts as knowledge if S could not easily have been wrong in similar situations.

Since safety principle does not put a necessary and sufficient condition upon knowledge, it is consistent with counterfactual: if P had been false, one would (or might) still have believed P. Accordingly, safety does not imply omniscience. What is important is that one can start with a non-safe knowledge and reach the safe knowledge eventually. Furthermore, *safe* is a gradable adjective. One state of believing can be more or less safer than the other. I will take that safe knowledge is a final state of the process in which one starts with a less safe knowledge reaching a more safe state. As Williamson says, "One's total evidence

[3] This formulation of safety condition significantly differs from Sosa's counterfactual formulation: "If S were to believe P, P would be true" (Sosa 1999: 146). Formally: $(B(P) \Box\!\!\rightarrow P)$.

is one's total knowledge" (Williamson 2000: 9). Applying elements of Williamson's theory to the argumentation process, let us start from the following formulation:

> S safely believes P in situation α, if, using method M in time T, S truly believes P and could not easily have been wrong in similar situations ß.

Applying Poirot's example at the time T, Hastings believes that the gardener is a murderer, founding his belief on evidence (the knife, blood and alibi) about which he has safe knowledge. Let us take that this knowledge is based on perception and direct experience. Also, Hastings forms a further belief that the gardener is the murderer, basing his belief on the *affirming of consequence* (AC) inference.

Of course, AC is the unreliable *method* and cannot bestow safe knowledge. But, the argumentation process is the reliable media that can provide means for the revision of false beliefs. Poirot's evaluation of Hastings' argument will make it clear to Hastings that he needs to abandon AC and use the *modus ponens* instead. Furthermore, Poirot might re-examine the evidences, refute some of them, find a new piece of evidence and offer the conclusion that it is not the gardener but the driver who is the murderer. To generalise a little, the argumentation process is the reliable media that is able to select, among those methods at hand, the ones that are more reliable. Using reliable methods, participants are in the position to reach safe knowledge. In this way, the argumentation is a media that increases their deductive competences. Learning to use reliable methods and increasing their deductive competences, it is likely that one will acquire safe knowledge (about P), in the way that one could not easily have been wrong in similar cases.

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