Logic and Reasoning

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Abstract: Logic, it is often held, is primarily concerned with reasoning; and the conviction that logic and reasoning are two sides of the same coin nowadays usually equates with the conviction that logic spells out some directives for the "right" management of beliefs. In this paper I put forward an alternative view, based on seeing rules of logic as *constitutive* rules, not instructing us *how* to reason, but rather providing us with certain vehicles *in terms of which* to reason. This also emphasizes the social nature of beliefs: they are entities forged in a *social* mold, formed by rules originating from social argumentative practices. Because of this fact, I suggest that trying to understand logic by means of studying (rules of) the kinematics of beliefs of a solitary individual is essentially misguided.

Keywords: logic, reasoning, belief, proof, argument

1 Logic and "belief management"

Logic, it is often held, is primarily concerned with reasoning, and sometimes even defined as *the* science of reasoning. Perkins (2002, p. 187) summarizes the traditional view of logic, nicely, as follows:

> For over two millennia, since the days of Aristotle and Euclid, the notion of formal logic has figured centrally in conceptions of human reasoning, rationality and adaptiveness. To be adaptive, the story goes, we must be rational about ends and means, truth and evidence. To be rational, we must reason about what means suit what ends, what evidence supports what conclusions. And to reason we must respect the canons of logic. It's common to note that transient moments of everyday cognition involve logical moves, at least implicitly. When you hear a dog bark outside, what you hear is a sound you recognize as a bark. You infer the presence of a dog, a deduction that might go:
>
> Around here, only dogs make the sound of a bark.

> I hear something that makes the sound of a bark.
>
> Therefore I hear a dog.
>
> Examples like these intimate that formal logic is far more than a playground and workshop for philosophers, mathematicians and designers of microchips. It is, if not the warp and woof of human reasoning, at least the warp, the woof perhaps being the beliefs from which we reason. Insofar as we are successful as a species in ways beyond the reach of chimpanzees, our logical prowess may be the cause.

The common conviction that logic and reasoning are two sides of the same coin nowadays usually equates with the conviction that logic spells out some directives for the "right" management of our system of beliefs, viz. rules that help us weave our web of beliefs in a "correct" way, especially when it is "correct" to incorporate a new belief. (Now of course an all-important question is what exactly the words "right" and "correct" here amount to— some, like Perkins, would try to explain these epithets in terms of a kind of practical success, but most, including Boghossian, are more likely to help themselves to the concept of truth, the nature of which then elicits further questions. However, for us in this paper, such questions are less pressing than the prior question as to whether the laws of logic can be seen as directives of a management of our webs of beliefs at all.)

If the laws of logic are indeed such directives, this would deliver a straightforward answer to the traditional question of the normativity of logic: it is normative in as much as it tells us what it is correct for us to do (for efficiency in coping with our environment, or expanding our collection of true beliefs etc.). Also, it would yield a clear-cut answer to queries concerning the relationship between logic and rationality. If to be rational is to hold only certain patterns of beliefs, which nowadays appears to be the standard view (Way, 2010), then logic is here to tell us how to achieve this. Hence this construal of logical laws appears to put many things into place in one sweep. What more could we want?

There is, however, a major problem with this view, which, I am convinced, renders it ultimately untenable: simply put, there is no sound way of explaining the laws of logic as governing the kinematics of the web of beliefs of an individual. In my opinion, belief is *primarily* a *social* matter, and only secondarily a *personal* one—not in the sense that one cannot believe *privatim*, but because propositions, which constitute the vehicles of

beliefs, are forged exclusively in a social mold. And I am going to argue that the laws of logic relate more to this mold than to any strategies of dealing with its products within an individual. (To be more precise, I think that *derivatively* these rules may *also* influence the individual belief management; however, this is only a by-product of their primary role.) Hence, though the fact that logic is a theory of reasoning is undoubtedly *in some sense* true, I am convinced that the sense in which it is is actually far more complex than generally assumed, or than the passages quoted above would suggest.

2   Do the rules of logic tell us how to reason?

In a book published about a quarter of a century ago, Harman (1986) insists that logic has very little to do with reasoning, in the sense of "reasoned change of view". For those holding that logic is the science of reasoning, this may be a rather perplexing claim. But on the other hand, if we consider the arguments of Harman, and indeed if we consult obvious facts at hand, we may well start to wonder why we ever thought that logic and reasoning are connected in this straightforward way. Let me quote a more recent paper due to Harman and Kulkarni (2006):

> In the traditional view, reasoning can be modeled by a formal argument. You start by accepting certain premises, you then accept intermediate conclusions that follow from the premises or earlier intermediate conclusions in accordance with certain rules of inference. You end by accepting new conclusions that you have inferred directly or indirectly from your original premises. One problem with the traditional picture is its implication that reasoning is always a matter of inferring new things from what you start out believing. On the contrary, reasoning often involves abandoning things you start out believing. ... You regularly modify previous opinions in the light of new information.

Look at one of the most basic rules of propositional logic, *modus ponens*:

$$A, A \rightarrow B \vdash B$$

We can easily imagine somebody using this step in reasoning. She forms a belief, say, that *if it is raining, Tom will take his umbrella when he goes*

out, and later she finds *that it is raining*. Hence, using modus ponens, she concludes *that Tom will take his umbrella when he goes out*.

But how exactly is *modus ponens* relevant for our reasoning? That once we have the beliefs A and $A \rightarrow B$, we should acquire the belief B? One of the problems pointed out by Harman is that we do not always use *modus ponens* in this way. Imagine that I go home and believe *that my wife is there*. Also I believe that *if my wife is at home, the door is not locked*. I come to the door and find it locked. What I naturally do is give up my belief *that my wife is at home*.

The second, more worrisome problem tabled by Harman is that were we to work out everything that follows from our beliefs, we would never find a place to stop, whereas we obviously only work out what follows when we expect to get something useful.[2] Hence perhaps *modus ponens* does not tell us how we *should* amend our beliefs, but merely how we *may* do so? But if this is so, the rule would tell us how to reason merely in a very indirect, and not very helpful sense. Clearly the space of moves that are in accordance with the laws of logic is abundant; hence we would immediately need some other rules to tell us how to really steer through it. This would seem to compromise seeing the rules of logic as helpful directives for belief management.[3]

MacFarlane (n.d.) considers a third possibility of the normative reading of laws of logic, namely the reading according to which a rule tells us that believing the premises gives us reason to believe the respective conclusion. Also, he distinguishes the scope of the deontic operator: in the case of *ought*, for example, we might read a law of logic so that believing its premises we ought to believe its conclusion; or so that if we ought to believe the premises, we ought to believe the conclusion; or, finally, so that we "ought to see it that" if we believe the premises, we also believe the conclusion. Then he makes one more distinction that cuts through the previous two: this distinction concerns reading the conclusion of the logical law in question

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[2]There is a further problem (though we will not tackle it in the present paper) with the construal of laws of logic as directives of beliefs management. What we do or do not believe is not generally a matter of our decision; and this would seem to compromise the possibility of seeing it as something that might be reasonably *prescribed* to us by a *rule*. The point is that a rule cannot bind us to do something that we cannot do; hence if we are not capable of changing our beliefs at will, there could hardly be rules that would bind us to do so.

[3]Moreover, we can ask what kind of inappropriateness or sanction would we be liable to were we to disobey *modus ponens* in our mind. Surely not a social one, such as compromising our status as a rational being in the eyes of others, for nobody would know. Hence, would the sanction consist in not being successful in our reasoning? But it is clear that we can imagine circumstances when reasoning *may* be successful even if it ignores any kinds of canons.

either as prescribing us to believe it, or not to disbelieve it. (This gives him, altogether, eighteen possible normative readings of the logical laws.) MacFarlane is inclined to go for "some combination" of (a) *you ought to see to it that if you believe the premises, you do not disbelieve the conclusion* and (b) *you have reason to see to it that if you believe the premises, you believe the conclusion.*

Now, though I think MacFarlane may have isolated the best of the spectrum of options, whether these are acceptable remains at least dubious.[4] While (b) does not seem to quite avoid Harman's objection that it would get our mind clogged with inferences, (a) contains an unclear notion of *disbelieving*. It seems that were we to interpret *disbelief* as simply lack of belief, then *not disbelieving* would simply collapse into *believing* (thus making this first option fall prey to the same problem as the second one), whereas were we to see it more as *believing the opposite*, it would again not tell us anything helpful w.r.t. what to really believe.

Given all of this, it may be good to return to Harman's argument against a straightforward linking of the laws of logic to reasoning. Field (2009, pp. 252–253) summarizes the outcomes of the argument in four points:

1. Reasoning (change of view) doesn't follow the pattern of logical consequence. When one has beliefs $A_1, \ldots, A_n$, and realizes that they together entail B, sometimes the best thing to do isn't to believe B but to drop one of the beliefs $A_1, \ldots, A_n$.

2. We shouldn't clutter up our minds with irrelevancies, but we'd have to if whenever we believed A and recognized that B was a consequence of it we believed B.

3. It is sometimes rational to have beliefs even while knowing they are jointly inconsistent, if one doesn't know how the inconsistency should be avoided.

4. No one can recognize all the consequences of his or her beliefs. Because of this, it is not reasonable to demand that one's beliefs be closed under consequence. For similar reasons, one can't always recognize inconsistencies in

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[4]It is fair to stress that as MacFarlane's paper remains unpublished (and on his home page, from where it is available, its author points out that he intends to rework it), this cannot be taken as a criticism. In fact it may be even inappropriate to refer to this kind of paper at all; however, the truth is that the systematicity with which this paper sorts out the possible deontic readings of logical laws w.r.t. reasoning is unmatched.

one's beliefs, so even putting aside point 3 it is not rea-
sonable to demand that one's beliefs be consistent.

In view of the problems with logic considered as a theory of "reasoned
change of view" we may relish a wholly different interpretation of the laws
of logic. Thus Field considers the possibility of seeing the laws of logic as
spelling out those forms of inference that necessarily preserve truth (Field
attributes this view to Harman; Harman, however, disowns it[5]); but ulti-
mately he dismisses this possibility as unviable. Hence, in the end, Field
returns to anchoring the laws of logic in reasoning and ends up with the
following probabilistic interpretation (Field, 2009, p. 262; where $P(X)$ de-
notes the probability of X):

> Employing a logic L involves it being one's practice that when
> simple inferences $A_1, \ldots, A_n \vdash B$ licensed by the logic are
> brought to one's attention, one will normally impose the con-
> straint that $P(B)$ is to be at least $P(A_1) + \ldots + P(A_n) - (n-1)$.

But again, this does not seem quite satisfactory. Unlike simply ascribing
a belief *simpliciter*, ascribing its probabilistic version (i.e. a probability the
ascribee associates with a belief) is a much more complicated matter with
much less clear content. Moreover, it is not clear how this avoids the "clut-
tering up our minds with irrelevancies"; for it seems that it again concerns all
the consequences of our beliefs; and adjusting all the relevant probabilities,
or even checking them, would again be an infinite process.

3   The social and normative nature of belief

Harman's objections might be understood as protesting merely against the
'direction' in which reasoning works and its 'compulsiveness': it does not
(always) proceed from what the usual laws of logic give as their premises to
what they give as conclusions. Sometimes it proceeds the other way around
(abandoning one of the premises rather than accepting the conclusions); and
sometimes it might even proceed leaning upon the laws of logic in more
complicated ways. This fact is, I think, important to note (and Harman
presents very persuasive arguments against the simplistic construal of rea-
soning), but what I am going to argue for here is that the problem with the
usual view of reasoning lays still somewhat deeper. In particular I think that

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[5]See (Harman, 2009).

the problem is already when we take for granted that the task of logic is to help us reasonably manage our beliefs, which we have and which it is not the business of logic to explain.

Indeed I think that once we take ready-made beliefs as an unquestioned point of departure of the application of logic, as something that must be explained by something that has nothing to do with logic (perhaps cognitive science?), we are well on the way into a blind alley. What I think is that it is essentially wrong to see logic as a theory of an individual's epistemic achievements. Though, of course, it is an individual who reasons, the ability of reasoning has, I am convinced, an essential social dimension; and logic should be seen as related to this dimension. Recently there has been much attention paid to the question *Is belief normative?*[6] and it seems to me that the answer to this question also gives us the key to understanding the role of the rules of logic w.r.t. reasoning; in particular I believe that what we need is a proper understanding of the sense in which any belief *is* a *normative entity*.

Let me stress, immediately, that I do not see the normativity of belief as stemming from its interconnection with truth (Boghossian, 2003; Weiner, 2005) or knowledge (DeRose, 2002; Williamson, 2000). Instead, I see beliefs as normative in a rather different sense, roughly in the sense in which chess pieces are. Chess pieces are normative entities because they owe their existence (*qua* such) to the rules of chess: it is these rules that make a material vehicle, a piece of wood or ivory or whatever, into a pawn, a rook, or a bishop. And as I see it, it is certain rules, and the rules of logic among them, that make certain material vehicles into 'embodiments of beliefs'.

What are the material vehicles of beliefs? It is often taken for granted that as beliefs are *mental* entities, then if we accept talk about its *vehicles*, then the vehicles must be some items within the brain, perhaps some constellations of electric potentials. However, I think that the direct material vehicles of beliefs are sentences, i.e. certain types of sounds (and/or scribbles). (Of course, this does not contradict the claim that some implementation of beliefs must be in the brain; sentences are also entities that exist somehow via human brains.) And just as it is the rules of chess that make pieces of wood into the chess pieces, so it is the rules of language that make types of sounds into meaningful sentences.

Of course, this raises some questions. Do I mean that there is no belief

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[6]See, e.g., (Boghossian, 2003; Engel, 2007; Glüer & Wikforss, 2009; Peregrin, 2012; Steglich-Petersen, 2006).

without language? Well, I do; but with two important provisos. First, I mean to say that there is no belief *in our human sense* without language; I do not mean to deny that even language-less brutes may be in states which we may tend to characterize as states of believing something. However, I think that saying about somebody that she believes something in our human sense of the word, involves saying that she knows the place of the belief within the network of many other beliefs (knows, for example, what follows from it or what must be the case for this belief to become true), and language, I am convinced, is the only substratum nourishing enough to sustain such a network.

The other proviso is that though there is no belief without a language, this does not mean that belief would generally be something like an inner assertion. There are, I am convinced, no believers who are not language users; but not every episode of belief must be a matter of language. I understand the constitutive connection between language and belief in the sense of Sellars' "verbal behaviorism": "According to VB [verbal behaviorism]", as he puts it in his characteristically cryptic way (Sellars, 1974, p. 419), "thinking 'that-p', where this means 'having the thought occur to one that-p', has as its primary sense [an event of] saying 'p'; and a secondary sense in which it stands for a short term proximate propensity [dispositional] to say 'p'".[7]

An important consequence is that if all of this is correct, then the rules of logic cannot be seen as *tactical* rules dictating feasible strategies of a game; they are the rules *constitutive* of the game as such.[8] This is a crucial point, because it is often taken for granted that the rules of logic tell us *how to reason* precisely in the tactical sense of the word. But what I maintain is that this is wrong, the rules do not tell us *how* to reason, they provide us with things *with which*, or in *terms of which*, to reason.[9]

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[7]The parenthetic comments are added by Rosenberg (2009). His exposition of Sellars' view may be also consulted for a more detailed elucidation.

[8]Let me stress that speaking of "constitutive" rules I do not mean *constitutive* as opposed to *regulative* in the terminology of Rawls (1955) or Searle (1969). "Constitutive" rules in the sense entertained here are opposed to "tactical" rules – constitutive rules are those that delimit the space of the game (and it is not important whether they delimit it purely conventionally or on some natural foundations, hence even regulative rules can be seen as constitutive in this sense), whereas tactical rules are those which advice how to move within the space with success.

[9]Another important point, which, however, we will not discuss in this paper, is the dimension of the rejection of the individualist construal of belief (and for that matter, knowledge) yielding the possibility of there being two completely identical individuals such that it would be justified to say of one of them, but not of the other, that she believes something. The point is that somebody's believing something, under this construal, depends not only on his state of mind, but also, as it were, on the social context and especially on what we may call the *in-*

Note that we can think about chess in a similar way. There are two kinds of rules of chess: First, there are rules of the kind that a bishop can move only diagonally and that the king and a rook can castle only when neither of the pieces have previously been moved. These are the rules constitutive of chess; were we not to follow them, then we would not be playing chess. In contrast to these, there are *tactical* rules telling us what to do to increase our chance of winning, rules advising us, e.g. not to exchange a rook for a bishop or to embattle the king by castling. Were we not to follow them, we would still be playing chess, but with little likelihood of winning.

We can imagine the rules of chess as something that produces the pieces, equips them each with its peculiar *modus operandi*, and then see the relevant tactical rules as consisting in setting the individual *modi* into the most efficient teamwork. The rules of logic, viewed analogously, would then have a slightly more complex role: along with furnishing us with logical concepts (each with its peculiar *modus operandi*) they also provide us with a mold in which we cast all other concepts so that they acquire their characteristic shape (and thus can combine with logical ones).[10] Then we face the problem of setting the individual concepts (logical and extralogical) into effective thinking (and we might consider articulating some directives or rules that could then be seen as the tactical rules of reasoning).

To say that the rules of logic are rules not for operating with propositions and beliefs, but rather with sentences (helping make them 'propositionally contentful') is to say that our language games pre-date our reasoning, and indeed pre-date meanings. This might seem a perplexing claim. How could we start to play a language game with *meaningless* sounds? Is not the very point of the games some kind of trafficking of *meanings*? But it only follows that there must have been a certain kind of bootstrapping going on: first proto-games, in which sounds had merely some rudimentary and simple functions (warning, attention attraction) and then some stepwise enhancement of their functionings going hand in hand with the games growing more complex, until they reached their current complicated form with

stitutional framework. (Compare believing thus construed with christening. It is obvious that there might be two completely identical individuals, doing completely the same movements, such that it would be justified to say of one of them, but not of the other, that she christens a newborn baby. There is nothing puzzling about the fact that christening can take place only within a clearly delimited institutional framework; and my point is that believing and knowing is, despite appearances, not quite unlike this.) I think that this follows from the fact that our knowledge claims are underlain by what Williams (2001) calls *default and challenge structure*.

[10]The other concepts are not produced by the rules of logic alone, they are co-produced by other kinds of rules. See (Peregrin, 2001) for details.

logical rules and with the functions of words and sentences portrayable as 'expressing concepts' and 'propositions'.

John Searle, reflecting on the origins of language, wrote:

> . . . imagine a class of beings who were capable of having intentional states like belief, desire and intention but who did not have a language. What more would they require in order to be able to perform linguistic acts? Notice that there is nothing fanciful in the supposition of beings in such a state, since as far as we know the human species once was in that state. (Searle, 1979, pp. 193–194)

What I have just said involves the exact contradictory of the last claim, namely I see no reason to believe that the human species *ever* was in such a state. Instead of assuming that argumentation is an externalization of reasoning, I am assuming that a certain, relatively recent upgrade of our reasoning faculties is effected by an internalization of argumentation. Thus, in contradistinction to the view of Searle, I concur with Mercier (2010) claiming that "reasoning evolved not to complement individual cognition but as an argumentative device".

4   From proving to reasoning

Let me summarize my view of the matter into the following four points:

1. *Logical rules, and inferential rules in general, are best seen as primarily concerned not with reasoning in the sense of belief management, but with demonstrations and proofs.*

2. *The rules which govern demonstrations and proofs can in turn be seen as rules of certain language games, especially the games which have to do with "giving and asking for reasons".*

3. *Neither demonstration, nor argumentation is an externalization of reasoning (but it can, to a certain extent, be internalized to constitute an extraordinary overlay of our normal reasoning proceedings).*

4. *Hence logical rules are rooted in the regulation of argumentation; the rules are constitutive of the very space of argumentation and consequently of beliefs as inner correlates of assertions – they are constitutive rather than tactical rules.*

The first two points do not seem to be too controversial. As to the first one, when we look at the writings of the most reflective of the founding fathers of modern logic, Gottlob Frege, we can see, from the beginning, that he aims his logical system at proofs, i.e. demonstrations; and he takes pains to stress that this has very little to do with actual reasoning in the sense of what happens in an individual mind. We can see that Frege (1879) saw the laws of logic as laws of reasoning exclusively in the sense of "way of carrying out a proof", which, unlike reasoning in the individualist sense, inevitably has to be public (the question how we can prove something is "more definite" than to be answerable "differently for different persons"). What the laws of logic capture is "not the psychological genesis but the best method of proof".

What is also crucial is that Frege's insistence on keeping with the elementary logical rules when composing proofs is *not* a tactical advise that should help us compose proofs effectively or skillfully. It is an advise that should help us not to leave the realm of logic in the first place; and that should help us make apparent that we are not leaving this realm.

As for the second point, the rules of the usual logical systems, which equip these systems with spaces of possible demonstrations and proofs, can be reframed in game-theoretical terms. Lorenzen (1955) was probably the first to try to erect logic on purely game-theoretical foundations; and the approach has gained in popularity during the beginning of the present century.[11] By fine-tuning the rules of the Lorenzenian games, we can make the games equivalent to various logical systems in the sense that there is a winning strategy for a game associated with a formula just in the case the formula is a theorem/tautology of the corresponding system. Such kinds of games can thus be seen as straightforward implementations of the corresponding logics—or, perhaps more appropriately, the logical systems can be seen as capturing the structure of the corresponding games.

The shift from demonstrations and logical systems to games makes it easier to explain how logic could have come into being. It is plausible that first there were rudimentary language games, which then, by growing in complexity, acquired something as a logical backbone, thereby entangling their sentences into ever more complicated logical interrelationships (such as consequence and incompatibility), and providing for the roles of logically complex sentences (negation as minimal incompatible, conjunction as inferential infimum etc.) The explicitly logical locutions then came into being as

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[11]See e.g. (Majer, Pietarinen, & Tulenheimo, 2009).

means of explicitly expressing these implicit logical relationships.[12]

Notice that language games are a matter public through and through (as Wittgenstein pointed out in his famous "beetle in the box" example;[13] anything that is principally accessible to only one of the players cannot be part of the game.) Rules of such a game must be public, and hence cannot involve the belief or knowledge of a player (at least, not unless these are also construed as publicly accessible). Importantly, this will exclude rules of the kind of *one may assert p only if one knows or believes that p.*

5   Reasoning as inner argumentation

Let me now turn my attention to the third point. It would seem that the rules of logic must be, primarily, rules of inner reasoning, of which the outer demonstration or the argumentation must be expressive. Overt steps of an argument appear to have to come into being as mirror images of some covert steps we carry out within our minds—if this were not so, the so-called arguments would be mere empty sequences of sounds or scribbles on paper. However, as I have already indicated, I am convinced that this appearance is misguided—'putting the cart before the horse', as it were. I would hold that covert reasoning as a sequence of those steps which are articulated by the laws of logic is much more probably derived from overt argumentation than the other way around.

I have already mentioned Sellars' *verbal behaviorism* as a plausible theory of how such faculties of mind as this proof-like reasoning (as well as, for that matter, propositional thought in general) derived from public practices. Sellars argues that how we construe what happens in our mind in terms of a kinematics of propositions or beliefs (initially from the first-person, but subsequently also from the third-person perspective) is parasitic on how we come to perceive linguistics behavior as the kinematics of utterances.[14]

Davidson (1991) is even more explicit in this respect:

> Until a base line has been established by communication with
> someone else, there is no point in saying one's own thoughts or

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[12]This is the so-called *expressivist* account for logic: the idea is that material inferences are more basic than logical ones and that the logical ones are the means of making the material inferences explicit. (See (Brandom, 2000, Chapter 1)).

[13]See (Wittgenstein, 1953, §293). See also (Peregrin, 2011).

[14]Sellars (1956) presents this stance in his much discussed Myth of Jones. See (deVries & Triplett, 2000) for a detailed exposition.

words have a propositional content. If this is so, then it is clear
that knowledge of another mind is essential to all thought and
all knowledge.

Aside of these philosophical accounts, there have also appeared, recently,
more empirically founded findings pointing in the same direction. Thus, for
example, Mercier and Sperber (2011) criticize what they see as "the classi-
cal view of reasoning", which has it that the principal function of reasoning
is to enhance individual cognition.[15] Mercier and Sperber argue on empiri-
cal grounds that this must be rejected because, far from purifying the mind
of mistaken beliefs, reasoning itself can bring in new mistakes, and over
and above this, it often rationalizes the existing beliefs instead of correcting
them.

These reasons are compelling, and justify the authors in putting forward
an alternative to the "classical view": what they propose is that the emer-
gence of reasoning is best understood within the framework of the evolution
of human communication:

> Reasoning enables people to exchange arguments that, on the
> whole, make communication more reliable and hence more ad-
> vantageous. The main function of reasoning, we claim, is *argu-*
> *mentative* ... Reasoning ... enables communicators to produce
> arguments to convince addressees who would not accept what
> they say on trust; it enables addressees to evaluate the sound-
> ness of these arguments and to accept valuable information that
> they would be suspicious of otherwise. Thus, thanks to rea-
> soning, human communication is made more reliable and more
> potent. (Mercier & Sperber, 2011, pp. 60–72)

Thus, when we internalize the laws of argumentative language games we
are facilitated to do covertly what was previously overt: namely, to con-
vince an audience by citing reasons. In this way, we gain a specific overlay
to our prior reasoning faculties, an overlay to which we take recourse when
solving certain specific tasks, or when we want to check meticulously the
conclusions achieved by means of ordinary reasoning. This new skill, how-
ever, does not displace our original ways of reasoning, nor diminish their

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[15]Recently, this view has acquired the shape of a theory that reasoning is a matter of an evo-
lutionary younger module of the mind/brain that had developed for the purposes of rehearsing
and correcting the mistakes of an evolutionary older, swifter and intuitive system of control of
behavior. See, e.g., (Evans & Frankish, 2009).

import—it is something that we do not use very frequently (if for no other reason than that it is time consuming, and most of our reasoning must be done in the 'on-line' mode).

I think that counterintuitive as this view might seem at first sight, it has a lot of plausibility to it. The problem many people would have with it is that while it seems to be a plain fact that it is an *individual* that reasons (in her, as it were, 'foro interno'), and that it is only an individual that can forge *meaningful* sentences to do the reasoning with. The view put forward here does not reject the first point—of course it is an individual that does the reasoning (though un-internalized argumentation done by a group of people can be perhaps also called reasoning). However, it does challenge the second point: meanings are brought into the mind from a public space where they are forged within the furnace of human interaction.

6   Laws of logic as constitutive

The individualistic approaches to logic (the "traditional views" criticized by Mercier and Sperber) take for granted that logic spells out tactical, rather than constitutive rules. Presumably, this is because *prima facie* there are no obvious alternatives to this construal of the rules of logic. Upgrading beliefs does not seem, on the surface, to be a game, at least not a game with any similarity to chess, *viz.* a game *constituted* by rules.

However, let us reappraise how we look at the constitutive rules of chess. We may see them, as we have before, as constituting the *pieces* as such: kings, rooks, bishops etc. Once we have these items, each of them coming with a specific 'behavior' (thus the bishop with the propriety of moving diagonally etc.), we can forget about the constitutive rules and see the space of chess as delimited by whatever it is possible to achieve with them. And the achievements are non-trivial, though they are usually not particularly important for us, chess not generally playing a significant role in our lives. Now the idea is that our beliefs are analogous to the pieces; that our tactics for dealing with them are based on the natures of the beliefs, these natures being established by constitutive rules.[16] And here the achievements we can reach when we learn to orchestrate beliefs efficiently are not only important, but also highly non-trivial: they help us steer clear of the perils of our world, and enjoy what it has to offer, much more effectively than before.

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[16]See (Peregrin, 2010) for a more detailed exposition of this.

This explains why the rules of logic do not really tell us how to reason, at least not in a very nontrivial sense—it is for the same reason that the rules of chess do not tell us how to play chess, except in the trivial sense that they tell us what are the permitted moves. To learn how to play chess we need another kind of rules (or guidances), the tactical ones. The former rules merely set up the stage, or produce the characters with which to play; it is only the latter ones that tell us what to do.

The fact that a proof or a demonstration consists of steps according to these very rules does not mean that this would be what we actually do when we reach new beliefs in our heads; it is a matter of the fact that a demonstration as such must be utterly transparent, in particular it must be clear that all its steps are legitimate. And the best way to make them clearly legitimate is to make them directly accord with the elementary rules. On the other hand, the fact that we have a lot of potential steps sanctioned directly by the rules, does not actively help us to chain such steps together appropriately to get a proof of a given claim. If this chaining were a matter of rules, then they would have to be rules very different from the constitutive rules which we borrow to assemble the proofs from.

We often say that human thought differs from that of other animals (insofar as these can be ascribed something as thought at all) because it is *conceptual*: that we humans, in contrast to our animal cousins, have *reason* (and hence are able *to* reason), that we can think and infer *logically* etc. The picture at which we have arrived here, suggests that logic is a kind of tool enhancing our thought 'from without'—we have developed certain complicated and useful social practices, crucially involving language, and these practices equipped us with certain tools that we later internalized. The tools are logical concepts that help us organize and effectively maintain what we know and what we believe.

7   Conclusion

I have argued that logical rules are not a matter of a strategy of an optimal belief management done by an individual; I have urged that they have an essential social dimension. The dimension does not make the individual dependent on the society in that the conclusions she reaches are not her own, but rather in that the very vehicles of reasoning are originally of a social making. The conjecture put forward and defended in this article is that these rules originated as rules of demonstrations and proofs, hence as rules

of certain (argumentative) language games. Inner reasoning, then is the internalization of public argumentation (rather than the other way around) – it is not that every reasoning would be a chain of covert assertions following one from another, but rather that every reasoning takes place on the conceptual and propositional level and hence uses vehicles that originated in public language games. The most important point to which this train of thought has led us is that logical rules, are *constitutive* rules, they are not *tactical* rules for dealing with beliefs and other propositions, but rather rules that are responsible for there being something as propositions in the first place.

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