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The normative role of logic for reasoning

(El rol normativo de la lógica para el razonamiento)

Alba Massolo*
Universidad Nacional de Córdoba

ABSTRACT: This paper advocates for the normative role of logic in reasoning. I offer a response, anchored in an externalist perspective, to two fronts of attack against the normativity thesis, namely Harman's sceptical challenge and the accusation of naturalistic fallacy. On the one hand, I rework dialogical bridge principles and show that such principles satisfy adequacy criteria to deal with Harman's challenge. On the other hand, I argue that it is possible to derive normative consequences from logical facts. This is because argumentative interactions among agents involve the acceptance of constitutive rules that entail obligations. Hence, since logical rules can be seen as constitutive of the social practice of reasoning, they create prescriptions for reasoning. Bridge principles make those obligations and prohibitions explicit.

KEYWORDS: philosophy of logic, logic and reasoning, normativity of logic, constitutive rules

RESUMEN: *Este artículo defiende el rol normativo de la lógica en el razonamiento. A partir de una perspectiva externalista, ofrezco una respuesta a dos frentes de ataque en contra de la tesis de la normatividad: el desafío escéptico de Harman y la acusación de cometer una falacia naturalista. Por un lado, reelaboro los principios del puente dialógicos y muestro que tales principios satisfacen los criterios de adecuación para hacer frente al desafío de Harman. Por otro lado, sostengo que es posible derivar consecuencias normativas de hechos lógicos. Esto se debe a que las interacciones argumentativas entre agentes implican la aceptación de reglas constitutivas que conllevan obligaciones. De esta manera, dado que las reglas lógicas pueden considerarse constitutivas de la práctica social del razonamiento, crean prescripciones para el razonamiento. Los principios puente hacen explícitas esas obligaciones y prohibiciones.*

PALABRAS CLAVE: filosofía de la lógica, lógica y razonamiento, normatividad lógica, reglas constitutivas

* ***Correspondence to:*** Alba Massolo. Universidad Nacional de Córdoba, Centro de Investigaciones María Saleme de Burnichon (CIFFyH). Pabellón Agustín Tosco, 1.er piso, Ciudad Universitaria (5000 Córdoba, Argentina) – alba.massolo@unc.edu.ar – https://orcid.org/0000-0001-7690-8574

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1. Introduction

According to a robustly settled idea in the philosophical tradition, logic plays a normative role in human reasoning, i.e., in order to reason correctly, an agent should follow logical laws. Nevertheless, in recent years, the normativity thesis has faced attacks from two fronts. On the one hand, the sceptical challenge laid out by Gilbert Harman (1986) points out the existence of a gap between logical laws, which refer to logical facts, and guidelines for reasoning, which refer to beliefs. On the other hand, it has been claimed that the argument in favour of the normativity of logic relies on a naturalistic fallacy (Russell, 2020). Thus, the normativity of logic so traditionally endorsed has been called into question. Is it still possible to defend the normative status of logic for reasoning?

The goal of this paper is to defend an externalist characterisation of reasoning and normativity. Within this characterisation, one can offer a compelling argument for the normative role of logic in reasoning. This characterisation can also lead to a dissolution of Harman's sceptical challenge, and provide a response to the accusation of infringing Hume's Law. In order to defend an externalist characterisation of reasoning and normativity, I consider reasoning as a social institution (Mackenzie, 1989), i.e., as a process of linguistic interaction among agents. According to this characterisation of reasoning as a social activity, logic is a system of rules that prescribes which of those linguistic interactions are (un) acceptable. In this view, logic is normative in that it regulates the argumentative exchanges among rational agents. Firstly, to deal with Harman's sceptical challenge, I rework the dialogical bridge principles developed by Catarina Dutilh-Novaes (2021) and show how these principles satisfy a series of adequacy criteria. Secondly, to respond to Gillian Russell's allegation of naturalistic fallacy, I elaborate a reply along the lines of John Searle's argument about the possibility of deriving a statement about obligations from statements about facts (Searle, 1969; 2021). In this sense, my argument is based on defining reasoning as a social institution. From there, I show that this type of linguistic interaction among agents involves the acceptance of certain constitutive rules that entail obligations. I propose a characterisation of logical facts as institutional facts. Therefore, normative consequences of logic are not derived from brute facts, but from logical ones, i.e., institutional facts.

The plan is as follows. In section 2, I will expose the two fronts of attack against the normativity thesis: Harman's sceptical challenge and the accusation of naturalistic fallacy. In section 3, I present a line of response that seeks to reinstate the normativity thesis by constructing bridge principles that connect logical facts with guidelines for reasoning. I argue that although bridge principles can satisfy adequacy criteria to deal with Harman's sceptical challenge, they do not succeed in justifying why a logical fact imposes obligations on beliefs. In section 4, I expose an externalist characterisation of reasoning and normativity, and I advance an argument for the normativity of logic for reasoning. In section 5, I show how it is possible to cope with the two fronts of attack once one has stepped into his externalistic framework. On the one hand, I rework dialogical bridge principles, and show that these principles can satisfy adequacy criteria to deal with Harman's sceptical challenge. On the other hand, I argue that it is possible to derive normative consequences from logical facts because argumentative interactions among agents involve the acceptance of certain constitutive rules that entail obligations. Hence, since the laws of logic can be seen as constitutive of the social practice of reasoning, they create obligations for reasoning. Bridge principles make those obligations explicit.

2. *Two fronts of attack against the normativity thesis*

The idea that logic is normative for thought or reasoning has been commonly accepted in the philosophical tradition. For instance, in Kant's words: "But in Logic the question is not of contingent, but of necessary laws; not how we do think, but how we ought to think" (Kant, 1800, 173). A similar idea can be traced in Frege's writings: "It is commonly granted that the logical laws ought to be guidelines that thought should follow to arrive at the truth" (Frege, 1893, xv). Thus, roughly speaking, the thesis of the normativity of logic defended by the tradition holds that logic constitutes a guide for reasoning and that deviating from it is, in some sense, incorrect. Nonetheless, this well-established thesis has faced attacks from two fronts. On the one hand, the so-called Harman's sceptical challenge (Harman, 1986), and, on the other hand, the claim that the normativity thesis is based on a naturalistic fallacy (Russell, 2020). I expose below the arguments presented in these two fronts of attack.

Firstly, according to Gilbert Harman, there exists a difference between implication and inference. While implication is a relation among abstract entities, namely, truth-bearers, inference or reasoning are psychological processes that can lead an agent to a reasoned belief change (Harman, 2002). In this way, logic is a theory of implication, but it is not a theory of reasoning or inference. A logical law like *modus ponens* establishes the following logical fact: $(\phi \to \psi) \wedge \phi \vDash \psi$. However, this law rules on truth-bearers, specifically, as per Harman, to propositions. And propositions are independent of an agent's beliefs. Since *modus ponens* is not a law about beliefs, it does not have any role in an agent's processes of belief formation and revision. Thus, there exists a gap between the laws of logic and the guidelines for belief management that take place during reasoning processes.

Furthermore, Harman's argument against the normativity thesis points out that there exist certain features of human reasoning that are hard to conciliate with the prescriptions of some logical principles. Let us consider the case of the logical rule: "The set of beliefs Γ implies ϕ", and of the guideline for reasoning: "If you believe the contents of Γ, you ought to[1] infer ϕ". There exist at least three different situations where the logical rule is valid, but the guideline for reasoning turns out to be inappropriate:

(i) Logic is accumulative, but reasoning or the process of reasoned belief change is not. Hence, an agent who has good reasons to believe that ϕ is false, instead of inferring ϕ, that agent would prefer to abandon some (or all) the beliefs contained in Γ.

(ii) Logic could impose excessive demands on reasoning. In the case of a complex derivation, the logical rules involved could require great talent to follow that proof. Thus, logic could turn out to be too demanding to guide an average agent's reasoning.

(iii) The logical prescription is to accept all the logical consequences of a set Γ, but if an agent believes all the consequences of her beliefs, the agent would clutter her mind with irrelevant information. Thus, to avoid cluttering, a guideline for reasoning cannot require agents to believe all the consequences of their beliefs.

[1] As it will be shown in section 3, this guideline for reasoning could be expressed in terms of an operator on beliefs that "allows" or "gives reasons to".

To sum up, the cognitive processes involved in human reasoning are marked by a limited processing capacity, working memory, attention, and time. As a consequence, human reasoning has to deal with plausibility and practicality problems that are out of the scope of logic understood as a theory of implication. That is why Harman rejects the normativity thesis.

Secondly, it has been claimed that the argument in support of the normativity of logic relies on a naturalistic fallacy (Russell, 2020). According to Hume's Law, a normative consequence can only be derived from a set of premises if at least one of those premises is a normative one. Let us consider the example of *modus ponens* again. For a logical rule like *modus ponens* to have normative effects on an agent's reasoning, that rule must establish some normative constraints for the agent's belief formation and management. Nevertheless, Gillian Russell (2020) has claimed such conditions are not met by the arguments in support of the normativity of logic. Her objection sets off from accepting the terms of Harman's sceptical challenge, as Russell states that logic is the study of truth-bearers and of the relation of necessary truth-preservation among those truth-bearers. Thus, logical laws rule over logical facts. In order to give a formal definition of a relation of logical consequence among truth-bearers, it is not required to appeal to any normative principle. Hence, laws of logic are descriptive. They describe logical facts about truth-bearers. Logic may have normative consequences for reasoning only if one adds some general epistemic principles or general norms about truth, such as "if ϕ is true, then A has reasons to believe ϕ" or "if ϕ is not a deductive consequence from Γ, then A is forbidden to believe ϕ" (Labukt, 2021; Tajer, 2022). Without these further principles, logic can be called a normative discipline only in a weak or derivative sense because logic by itself does not impose any normative constraints. In other words, logic is not intrinsically normative.

Therefore, Russell's argument seems to further undermine the normativity thesis, because it seems that the only way to fill the gap between logical laws and guidelines for reasoning is by committing a naturalistic fallacy, i.e., by accepting that normative consequences are derived from descriptive laws. As it seems, a defence of the normativity of logic would require that one abandons a strong thesis about the intrinsic normativity of logic and that one holds, instead, that logic is normative only in a derivative sense.

3. Bridge Principles

To restore the normative status of logic for reasoning, one line of response has proposed the formulation of bridge principles that link logical facts to the normative constraints on reasoning that these facts give rise to (Evershed, 2021; MacFarlane, 2004; Steinberger, 2019).

> [1] General structure of a bridge principle: If $\Gamma \vDash \phi$, then (a guideline stating that if agent A believes Γ, then that leads her to believe ϕ).

The antecedent of [1] is a logical fact, while the consequent is a normative constraint on agent A's beliefs management. From this general bridge principle, it is possible to build different bridge principles by varying:

(a) The kind of deontic operator in the normative constraint on the agent's beliefs. The options, from the strongest to the weakest, are: "ought to", "has reasons to", or "is permitted to".

(b) The polarity of the operator, i.e., whether these obligations, reasons, or permissions lead to believe ϕ or not to disbelieve ϕ.
(c) The scope of the operator, i.e., whether the operator has wide scope over the entire condition, whether it embeds into both the antecedent and the consequent, or whether it embeds into just the consequent.

Besides, one can also consider whether the logical fact in the antecedent of [1], i.e., $\Gamma \vDash \phi$, has to be believed, known, or considered true by agent A. Moreover, A's beliefs could admit degrees instead of be given in absolute terms. These variations on [1] give rise to the construction of 72 different bridge principles (Evershed, 2021). To determine which of these 72 principles is (or are) suitable for filling the gap between logical facts and guidelines for reasoning, there exists a series of adequacy criteria that the bridge principle(s) chosen must satisfy. Next, I analyse these adequacy criteria.

Firstly, bridge principles should consider situations (i)-(iii) regarding Harman's sceptical challenge, pointed out in section (2) above. The following three adequacy criteria highlight these situations:

(i) An agent should be able to revise their beliefs, i.e., to abandon all or any of the beliefs in Γ, if ϕ is not a consequence she is willing to accept.
(ii) Given the cognitive and computational limitations of human agents, arriving at some of the consequences from Γ could be too demanding. Thus, excessive demands should be avoided.
(iii) Since many of the consequences that follow from Γ might not be of relevance, to avoid cluttering, agents should not be forced to believe all the consequences from Γ.

In addition, MacFarlane (2004) has stated these other four criteria:

(iv) In the case of a numerous set of beliefs, an agent should be able to believe that each sentence is true, but that the conjunction of all such sentences is false. In other words, *the preface paradox*[2] should be admitted.
(v) Normative guidelines derived from logical facts should guide reasoning regardless of whether the agent believes or knows those logical facts. This adequacy criterion has been called priority question.
(vi) As there is something wrong with an agent who does not believe the logical consequences of her beliefs, agents should be required to either accept ϕ or either abandon any of the beliefs in Γ strictly.
(vii) If an agent believes ϕ and ψ, not only can she not disbelieve the conjunction of these two beliefs, but she should also be required to believe $\phi \wedge \psi$.

According to MacFarlane, a suitable bridge principle, capable of connecting logical facts with guidelines for reasoning, should satisfy criteria (i)-(vii). However, it has been noted that this set of criteria is not free of internal contradictions (Evershed, 2021; Field & Ja-

[2] The preface paradox, introduced by David Makinson (1965), depicts the situation of a person who has written a book and, in the preface, declares that while she believes that all the statements contained in the book are true, she also believes, given her human fallibility, that the conjunction of all those statements is false.

cinto, forthcoming; Steinberger, 2019). There exists a conflict between criterion (iv), on the one hand, and criteria (vi) and (vii), on the other, since the preface paradox is incompatible with the requirement of believing in the conjunction of all the beliefs in Γ, and with the need to abandon either ϕ or any of the beliefs in Γ. Besides, there exists a conflict between criteria (ii) and (v), insofar as some logical facts could constitute excessive demands if they induce guidelines for reasoning. As a consequence, it follows that no bridge principle can satisfy these seven criteria.

In order to deal with these internal contradictions among adequacy criteria, Florian Steinberger (2019) has differentiated three normative functions of logic, and he has shown that these contradictions are due to inherent differences in those three characterisations. In this way, norms for reasoning can play at least these three functions: (1) Directives: first-personal guidelines for reasoning. (2) Evaluations: objective, third-person evaluation standards that establish ideal criteria of correctness. (3) Appraisals: third-person criteria for making criticisms to epistemic peers.

According to Steinberger, Harman's sceptical challenge cast doubt on the directive function of logic for reasoning. However, criteria (i)-(vii) are not equally acceptable for these three different normative functions. While criterion (v) seems acceptable for an evaluative bridge principle, criterion (ii) seems acceptable for a directive one. Besides, even though criteria (iv), (vi), and (vii) are related to a directive role of logic, criterion (iv), the preface paradox, is suitable in contexts with a large number of premises, while criteria (vi) and (vii) are acceptable in few-premises contexts. As a consequence, Steinberger has proposed a directive bridge principle that satisfies the relevant adequacy criteria according to the context of reasoning:

> [2] Directive validity bridge principle: If, according to A's best estimation at the time, A takes it to be the case that $\Gamma \vDash \phi$ and A has reasons to consider ϕ, then A has reasons to (believe ϕ if A believes all the contents in Γ).

An alternative path has been followed by James Evershed (2021), who has proposed the construction of invalidity bridge principles. From the logical fact $\Gamma \nvDash \phi$, a prohibition is established for an agent to form the belief ϕ via deduction from Γ. Since invalidity bridge principles impose different obligations from those imposed by validity bridge principles, not all adequacy criteria are relevant for this type of principle. Evershed has argued that the relevant criteria for directive invalidity bridge principles are (ii), (v), and (vi). And there seems to be no conflict between these three criteria. Thus, to meet Harman's sceptical challenge, Evershed has proposed:

> [3] Directive invalidity bridge principle: If in A's best estimation, $\Gamma \nvDash \phi$, then A is forbidden to form the belief ϕ from Γ relying on deductive methods.

In both Steinberger's and Evershed's proposals, from a logical fact, either $\Gamma \vDash \phi$ or $\Gamma \nvDash \phi$, a normative consequence for reasoning is derived. However, this derivation seems to depend on a naturalistic fallacy, because a pure logical fact cannot impose any normative constraint (Russell, 2020; Searle, 2020). To derive from a logical fact that either an agent has reasons to believe ϕ, or is forbidden to form the belief ϕ, it seems necessary to appeal to other general epistemic norms. For example: "if ϕ is true, then A has reasons to believe ϕ"

or "if ϕ does not follow deductively from Γ, then A is forbidden to form the belief ϕ" (Labukt, 2021; Tajer, 2022). These epistemic norms constitute a necessary step in deriving normative consequences for reasoning. They are the normative element in the premises of the argument. Thus, since general epistemic principles are needed to derive normative consequences, it seems that logic by itself is inert as a normative guide for reasoning. Consequently, bridge principles are not enough to justify the normative role of logic for reasoning. They can only give grounds for a weak or derivative sense of the normative status of logic[3].

4. A proposal in terms of social naturalism

In this section, I present the basic structure of my response to the two fronts of attack against the normativity thesis. Both Harman's sceptical challenge and the responses elaborated in the framework of bridge principles are based on an internalist characterisation of reasoning. According to an internalist characterisation of reasoning, the psychological processes involved in management and belief formation are individual, i.e., they are solitary processes. Consequently, the normative role of logic with respect to those processes (should logic have any) would be a first-person role (Steinberger, 2019). However, it is possible to construct an alternative characterisation of reasoning from an externalist perspective (Mackenzie, 1989), and thus defend a different normative role of logic with respect to human reasoning. Following these ideas, I present an externalist construction of the concept of reasoning, and describe logic as the result of the theoretical reconstruction of the system of rules that governs the social activity of reasoning (Dutilh-Novaes, 2021). These two characterisations, provide a solid basis for substantiating the normative role of logic with respect to reasoning. The response I offer could be referred to as *social naturalism*.

4.1. Reasoning as a social activity

From an externalist perspective, reasoning is considered to be a social phenomenon, that is to say, a certain type of interaction among different agents (Mackenzie, 1989). Specifically, this type of interaction consists of an exchange of reasons to justify and accept a conclusion, or to refute it and reject it. In this way, reasoning is an argumentative exchange based on linguistic interactions. Moreover, reasoning is itself a social institution, and because of that, it has an origin and a history. In this sense, reasoning is not conceived as an individual mental process that every agent carries out by itself. Instead, it is a social process that has been practised since Ancient times.

These linguistic interactions form a dialogue, i.e., an ordered sequence of interventions made by the different agents involved in the social process of reasoning. Thus, in the dialogical process of reasoning, there is an argumentative exchange among multiple agents

[3] Field & Jacinto (forthcoming) have provided counterarguments to Russell's (2020) and Labukt's (2021) claims challenging the intrinsic normativity of logic, by noticing that they are based on implausible epistemic norms. However, it is important to note that Field & Jacinto (forthcoming) do not offer results supporting or rejecting the intrinsic normativity of logic. They solely provide a limitative result for certain bridge principles.

(Dutilh-Novaes, 2021). However, it is important to note that not every conversational exchange makes up a dialogue. There are linguistic interactions that only seek to exchange information, but they do not seek to arrive at an agreed conclusion. To avoid misunderstandings, the term "dialogue" is going to be reserved for the types of dialogues clustering around persuasion dialogues (Walton & Krabbe, 1995). Although collective and personal goals are different among these different types of dialogues, all of them share the seeking for persuasion, and the goal of arriving at some consensus.

In a dialogue, linguistic interactions form an ordered sequence of speech acts (Reinmuth & Seiwart, 2016). These linguistic expressions uttered by distinct agents, or parties, have different illocutionary forces, namely, assuming, asserting, inferring, accepting, concluding, questioning, rejecting, refuting, and retracting something, among others. What is more, the agents involved in the dialogue share a commitment store formed by the agreements reached thus far in the dialogue (Mackenzie, 1989). An essential aspect of these linguistic interactions is that they are subject to rules that regulate these speech acts, so that some of these interactions are permitted while others are not. Let us consider the following two examples:

[4] Example 1:

1. A [asserts]: 14 is an even number.
2. B [questions]: I am not sure that 14 is an even number.
3. A [asserts]: If a number is divisible by 2, then it is an even number.
4. B [accepts]: I agree.
5. A [asserts]: 14 is divisible by 2.
6. B [accepts]: I agree.
7. A [infers]: Therefore, 14 is an even number.
8. B [questions]: Could 14 be divisible by 2 and still be an odd number?
9. A [supposes]: If a number were both divisible by 2 and an odd number, this would contradict the principle we accepted in step 3.
10. B [accepts]: I agree.
11. A [questions]: Are there reasons to reject the rule in step 3?
12. B [rejects]: I don't think so.
13. A [concludes]: Then 14 is an even number.
14. B [accepts] I agree.

[5] Example 2:

1. A [asserts]: Secretariat is a marsupial.
2. B [questions]: I'm not sure that Secretariat is a marsupial.
3. A [asserts]: If an animal is a marsupial, then it is a mammal.
4. B [agrees]: I agree.
5. A [asserts]: Secretariat is a horse. And horses are mammals.
6. B [accepts]: I agree.
7. A [infers]: Therefore, Secretariat is a marsupial.
8. B [questions]: Could Secretariat be a mammal and not be a marsupial?
9. A [supposes]: If an animal were a marsupial but not a mammal, this would contradict the principle we accepted in step 3.

10. B [rejects]: No, the rule we accepted in step 3 says that, if an animal is a marsupial, then it is a mammal. But what we know about Secretariat is that it is a mammal because it is a horse. But some mammals are not marsupials.
11. A [agrees]: I agree.
12. A [retracts]: We cannot assert that Secretariat is a marsupial.
13. B [asserts]: Horses are not marsupials.
14. A [infers]: Therefore, Secretariat is not a marsupial.

As can be seen, [4] shows the regulation of the dialogical process of reasoning from *modus ponens*, allowing the acceptance of the proposed conclusion, while [5] shows how the fallacy of affirmation of the consequent is rejected as a regulation of this process, abandoning the proposed conclusion. In this way, reasoning as a social process is regulated by a series of rules that are accepted, and sometimes made explicit, in the course of the dialogue. Moreover, the information shared by the agents generates a commitment store that is revised when new information or agreements are incorporated. In these dialogues, one of the parties involved provides arguments for defending a certain conclusion, while another party (or other parties) questions that conclusion, and asks for reasons either to accept it or to reject it. In the examples above, these roles were performed by A and B, respectively. Besides, as can be seen at the end of [5], these roles can be swapped throughout the dialogue.

It is worth noting that this externalist characterisation of reasoning hinges on a strong presupposition of cooperation. Even though every party in the dialogue has a personal goal, there exists a common goal, namely, to derive an adequate conclusion by reaching an agreement. And the only way to achieve this is to engage in a cooperative process with the other dialogue participants. While the main objective of persuasion dialogues is to reach an agreement, it is important to note that these dialogues occur in diverse argumentative domains, each with its own specific goals. Consequently, in certain domains, some classical rules such as the rule of explosion, which claims that anything follows from a contradiction, may be overly stringent for regulating a dialogue. Thus, in some specific cases, constitutive rules of reasoning could give rise to rules that diverge from classical logic.

According to Mackenzie (1989), it is possible to distinguish an internalist account of reasoning from the externalist one. Thus, the internal process of reasoning can be seen as an internal representation of the external processes underlying reasoning as a social phenomenon. In this way, both the internalist and the externalist notions of reasoning can be used to give an account of the other. Besides, during the social process of reasoning, each agent carries out both internal and individual reasoning processes. Thus, the externalist and the internalist perspectives can be seen as two equally appropriate accounts of reasoning. However, it is possible to give an argument in favour of the externalist characterisation of reasoning, and to show that the internalist account can only be derived from the former.

Recent theoretical and empirical developments in evolutionary cognitive psychology have argued that human reason has an eminently social function (Mercier & Sperber, 2017). Reason would result from an evolutionary process in which cooperation and communication among human beings played a fundamental role in the species' survival. Furthermore, it has been argued that the evolution of human reasoning is linked to the need to align our intentions so that we can modify our beliefs. This effort in aligning intentions enabled us to carry out the cooperative activities that made the survival of our species possible (Norman, 2016; Tomasello, 2014). In a similar argumentative line, the cognitive gadgets

hypothesis considers human cognition to be the result of cultural evolution (Heyes, 2018). Hence, it can be stated that human reasoning emerges from these heterogeneous social practices of giving and asking for reasons (Brandom, 1994). The internal process of solitary reasoning can be understood as an internalisation of this social practice (Dutilh-Novaes, 2021). Thus, reasoning can be understood as a practice that initially originated externally, but that only later became internalised. As evident from this proposal, it establishes a close connection between reasoning and argumentation, considering them as two intertwined aspects of the same phenomenon. Consequently, this perspective aligns with conceptions of reasoning that acknowledge that there is nothing in the internal processes of reasoning that cannot be expressed in terms of observable or public phenomena.

4.2. Logic as a regulation of this social activity

Catarina Dutilh-Novaes has recently proposed (in her 2021 work) a hypothesis about the dialogical origins of logic in line with the construction of reasoning as a social activity presented above. According to this hypothesis, deductive logic is a theoretical reconstruction of the processes of linguistic interaction which take place in dialogues and debates. A core justification of this thesis is based on a historical argument. In this way, she argues that the beginning of logic in Western philosophy was marked by the dialogical interactions of Ancient Greece[4]. It has been observed that both argumentation and persuasion played a central role in civic life in Athenian democracy. Thus, it seems that the debating practices of that political and social context directly influenced the development of deductive argumentation, giving rise to logic. To give support to this thesis, it can be noted that Platonic and Aristotelian writings employed plenty of vocabulary referring to dialogical situations. In this way, it is believed that the origin of deductive proofs could have emerged from these dialogical interactions among agents. However, the regimentation of these proofs in the written language seems to have overshadowed those original dialogical elements.

Beyond the situation of Athenian democracy, these dialogical components can also be traced in the Latin medieval tradition where logic and dialectic were often treated as synonymous expressions. For instance, the theory of obligations presents a regimentation of the practice of disputation, which involves two participants, one known as the opponent and the other known as the respondent. *Obligationes* were used to provide practical knowledge for performing adequately in such disputations (Dutilh-Novaes, 2011; Dutilh-Novaes & Uckelman, 2016, Uckelman, Maat & Rybalko, 2018). Nonetheless, from early modernity onwards, the dialogical components of deductive logic began to be omitted until they were completely absent (Dutilh-Novaes, 2015). This was due to the emphasis placed on the individual discovery of new truths during modernity. This new characterisation of logic as a solitary activity is noticeably expounded in Descartes' writings. And it was further consolidated with Kant's thought.

This historical argument is concerned with the origins of deduction as a fully developed theory. Consequently, the normative role of logic in reasoning exclusively refers to

[4] Dutilh-Novaes (2021) also presents historical arguments regarding the dialogical origins of deduction in Indian and Chinese cultures. However, her analysis leads to the conclusion that a comprehensive theory of deduction did not fully develop within these traditions, at least during the early stages.

deductive rules or principles. However, this approach to normativity does not label other cultural reasoning approaches wrong or incorrect. Instead, it underscores that a normative role for this deductive theory can be established within the framework of social naturalism, without detriment to other forms of reasoning.

Following this line of argumentation, logic can be seen as a system of rules for regulating linguistic interactions in the framework of a dialogue. In other words, it establishes rules for distinguishing correct interactions from incorrect ones. However, the rules that make up a formal logical system are the result of a theoretical reconstruction. And, because of that, they are expressed in a syntax that requires rigorous principles of formulae formation. Moreover, these formal rules must satisfy many mathematical properties. As a consequence, the resulting formal systems will have a strong degree of generality and simplification in comparison with the original dialogical rules. It can also be argued that the consolidation of the internalist perspective of reasoning, which prevailed in the tradition from modernity onwards, influenced the gradual overshadowing of these dialogical components.

Arguably, logic as a system of rules that regulates linguistic interactions in the framework of a dialogue is the result of a process of reflective equilibrium. As stated by Nelson Goodman (1955), there exists a mutual adjustment between logical rules and inferential practices. In this sense, this bidirectional process makes it possible to justify a logical rule because it is in accordance with an inferential practice and, at the same time, to accept an inferential practice because it is in agreement with a logical rule. Reflective equilibrium applications have been used to account for the nature of logic (Peregrin & Svoboda, 2017), and also for justifying the normative status of logic (Prawitz, 2007; Resnik, 1985). However, it is widely known that this proposal has faced a number of criticisms (Martínez-Vidal, 2004; Pereira, 2006; Shapiro, 2000). I will not delve into a discussion of these criticisms here. However, as I have argued elsewhere (Massolo, 2021), reflective equilibrium can provide a robust framework for upholding the normative role of logic in reasoning, from an externalist viewpoint. In that previous work, I have also advocated for a pluralist position that supports the normativity of logic. This stance serves as my response to the ongoing debate surrounding logical pluralism and its compatibility with the normativity of logic which has garnered considerable attention recently (Blake-Turner, 2021; Blake-Turner & Russell, 2021; Ferrari & Moruzzi, 2020; Stei, 2020). Commonly known as the *collapse problem*, this debate posits that if there are many logics, then there must also be different normative guidelines. This raises a pivotal question: if logic is normative for reasoning, how can an agent determine which of these numerous standards to follow to reason correctly? In my proposal, I endorse contextual pluralism which suggests that different standards are employed in different domains of argumentation. This approach offers an alternative solution to the collapse problem.

Logic, characterised as the theoretical reconstruction of a system of rules that regulates dialogical processes among agents, has a normative role for reasoning because it requires the acceptance of certain linguistic interactions and the rejection of others. In this sense, the rules of logic specify which sequences of speech acts an agent can and must perform in order to accept or reject a given conclusion. Logical rules permit, oblige, or forbid different linguistic interactions. This leads to an intrinsically normative role of logic in social reasoning processes. Therefore, it is possible to defend an intrinsic normative status of logic. However, it is not first-personal guidance for solitary reasoning, in the sense of establishing directives, as identified by Steinberger (2019), and mentioned here in section 3 above. The intrinsic normativity of logic lies in the regulation of dialogical argumentative interactions that enable agreements.

5. A response to the two fronts of attack against the normativity thesis

In this section, I defend a normative role of logic for reasoning that responds to Harman's sceptical challenge, as well as to accusations of naturalistic fallacy. Both responses are based on the social naturalistic perspective developed in the previous section. Firstly, I address Harman's challenge on the basis of dialogical bridge principles. Secondly, I argue that logical facts, i.e., logical rules, establish normative constraints for the social process of reasoning. Thus, logic is intrinsically normative.

5.1. Dialogical bridge principles

As mentioned above, a line of response to Harman's sceptical challenge proposes the construction of bridge principles to fill the gap between logical laws and guidelines for reasoning. In the externalist framework I have adopted, it is possible to build a dialogical validity bridge principle to connect logical facts, on the one hand, with admissible linguistic interactions during a dialogue, on the other. Thus:

> [6] Dialogical validity bridge principle: Agent A ought to see that, if she has accepted a set of assertions Γ and agent B infers ϕ from Γ via an agreed rule, then A should accept ϕ.

Principle [6] is a re-elaboration of the proposal made by Dutilh-Novaes (2021). It makes explicit the dialogical circumstances in which an agent should accept a conclusion. Briefly put, these circumstances establish that in the context of a dialogue, if an agent inferred a conclusion from a set of assertions, and both the inference rule and the assertions were previously agreed upon, then the other party of the dialogue should accept that conclusion.

Let us consider now if [6] satisfies the set of criteria (i)-(vii) mentioned in section 3 above, and how this dialogical principle can deal with the internal inconsistencies of this set. Regarding criterion (i), the broad scope of the operator (ought to see that) allows agent A to give up on her belief of the assertions in Γ if she refuses to accept ϕ. Let us consider a scenario where agent A has accepted $\psi \rightarrow \phi$ and ψ, and agent B infers ϕ using *modus ponens*, a logical rule that has already been agreed upon. According to principle [6], agent A should accept ϕ. However, if A refuses to accept ϕ due to considering it untenable, [6] allows agent A to discard her beliefs in $\psi \rightarrow \phi$ or ψ, or even to renounce her acceptance of *modus ponens*. Hence, rejecting ϕ remains an open option for the agents engaged in the dialogue, thereby ensuring belief revision. Concerning criterion (ii), agents A and B can be assumed to have similar cognitive and computational limitations. In this way, it is possible to avoid the requirement of excessive demands because the conclusions derived in the framework of a dialogue could not be too demanding for either of the parties. Criterion (iii) can be satisfied thanks to the commitment store that is built up in the course of the dialogue (Mackenzie, 1989). Thus, the fact that this store is constructed on the basis of dialogue would prevent the set Γ from being cluttered with trivialities.

Criterion (iv) suggests the admission of the preface paradox. As mentioned in section 3, there exists a conflict between this criterion and criteria (vi) and (vii). In this sense, Steinberger (2019) has claimed that the preface paradox applies to argumentative contexts that handle a large number of beliefs. In the case of [6], it can be argued that criterion (iv) only applies to large commitment stores. In smaller stores, criteria (vi) and (vii) apply.

Besides, regarding the preface paradox, it can be stated that in a dialogical setting, maintaining consistency during an argumentative dialogue among agents is less demanding than in instances of solitary reasoning (Dutilh-Novaes, 2021). Criterion (v) states that the laws of logic should guide reasoning regardless of the agent's knowledge of them. However, in a dialogical setting, this criterion seems unnecessary because the rules of inference can be made explicit during the linguistic interaction. In this way, an agent who was unaware of a logical rule can become aware of it and, from then on, accept it or question it. Consequently, it is possible to avoid the contradiction between criteria (ii) and (v) if one endorses a dialogical validity bridge principle such as [6].

Regarding criterion (vi), in a dialogical setting, the options for an agent are to accept ϕ, abandon one of the assertions in Γ, or reject an inference rule. These three options were made explicit in examples 1 and 2 presented in section 4. Hence, this criterion can be satisfied because agents involved in a dialogue can perform linguistic interactions with the illocutionary force of retracting a given assertion if they are unwilling to accept a conclusion. For a dialogue to continue, one of these options must be agreed upon. Concerning criterion (vii), the positive polarity of [6], insofar as it establishes that agent A should accept ϕ, seems to be a reason to think that this criterion is satisfied. Hence, if agent A believes ϕ and ψ, and the logical law $\phi, \psi \vDash \phi \wedge \psi$ has been accepted, then principle [6] guarantees that agent A should accept $\phi \wedge \psi$.

Similarly, it is possible to build in this framework a dialogical invalidity bridge principle. This kind of bridge principle establishes prohibitions regarding conclusions acceptance. Thus:

> [7] Dialogical invalidity bridge principle: Agent A ought to see that, if she has accepted a set of assertions Γ, and B shows that from Γ it is not possible to infer ϕ via any agreed upon rule, then A is forbidden to accept ϕ by deduction from Γ.

As [7] is an invalidity bridge principle, relevant criteria for analysing its adequacy are only (ii), (v), and (vi) (Evershed, 2021). Let us consider whether [7] satisfies these three criteria. Regarding (ii), in this dialogical setting agents A and B can be supposed to have similar cognitive and computational limitations. Hence, this excludes the possibility of making excessive demands. As for (v), since inference rules can be made explicit during the dialogue, if an agent was unaware of a logical law, she can become aware of it in the course of the dialogue. Lastly, concerning (vi), if the logical fact $\Gamma \nvDash \phi$ has been accepted during the dialogue, then agents ought not to deduce ϕ from Γ. In fact, [7] forbids this linguistic interaction. Consequently, [7] satisfies the set of relevant adequacy criteria for invalidity bridge principles.

Thus, Harman's sceptical challenge can be met within this social naturalistic perspective by building dialogical validity and invalidity bridge principles. On the one hand, dialogical bridge principle for validity makes the agent's obligations explicit. On the other hand, dialogical bridge principle for invalidity makes the agent's prohibitions explicit. Nevertheless, notwithstanding the adequacy of [6] and [7], the question of the intrinsic normativity of logic remains open. If logical laws are mere descriptions of relations among abstract entities, then the only way to derive normative consequences for reasoning is by adding general epistemic norms to bridge principles. Otherwise, a naturalistic fallacy would be committed.

5.2. From "is" to "ought"

To defend an intrinsically normative role of logic, it is necessary to show how logical rules themselves impose normative constraints on reasoning. In section 4 above, reasoning was characterised as a social institution (Mackenzie, 1989), i.e., as a process of linguistic interactions governed by a set of rules that permit, prohibit, or oblige to engage in certain interactions. From this starting point, I develop here an argument along the lines of John Searle's proposal, in order to show that logical rules are not mere descriptions of logical facts. Instead, they impose obligations and prohibitions on the activity of reasoning that they both create and regulate.

To inform my standpoint, I draw an analogy with John Searle's argument on the possibility of deriving statements about values from statements about facts (Searle, 1969; 2021). Searle's argument deals with the normative consequences of promises. His thesis shows that uttering certain words entails obligations for the utterer. Let us consider now the details of this derivation as formulated by Searle in (1969):

1. Jones uttered the words, "I hereby promise to pay you, Smith, five dollars".
2. Jones promised to pay Smith five dollars.
3. Jones placed himself under (undertook) an obligation to pay Smith five dollars.
4. Jones is under an obligation to pay Smith five dollars.
5. Jones ought to pay Smith five dollars.

In this manner, an "ought" is derived from an "is" without adding any evaluative extra premise. The proof proceeds as follows: from an utterance, a specific speech act is identified. And from there, an obligation and its succeeding "ought" are made explicit. This argument relies on an analysis of the meaning of the words involved in the utterance. In this sense, Searle claims that, as in the case of "promise", some words contain descriptive and evaluative components. This is the reason why their usage establishes obligations. The meaning of words like "promise" is given, in part, by constitutive rules. Hence, from a mere brute fact, namely, Jones uttering certain words, an institution is invoked thereby generating an institutional fact. Performing certain speech acts imply the commitment to the observance of a series of constitutive rules. In Searle's words "institutional facts can only be explained in terms of the constitutive rules which underlie them" (*ibid.,* p., 52).

This characterisation of institutional facts as systems of constitutive rules leads us to further describe the Searlean distinction between regulative and constitutive rules. While regulative rules regulate a pre-existing activity, not only do constitutive rules regulate an activity but also create it (Searle, 2021). Paradigmatic examples of these two sorts of rules are, on the one hand, such rules as the rules of etiquette which regulate the interpersonal relationships that have existed before those rules and, on the other hand, such constitutive rules as the rules of football that define the activity proper of playing football. However, it is worth noting that constitutive rules have a regulative dimension (Schauer, 2021). In this sense, for instance, the rules of football constitute the concept of offside. Hence, the offside position exists because the rules of football create the mere notion of offside. But a player who is in an offside position is penalised for that move. Consequently, the rules of football both define the game and regulate it.

Similarly, the social process of reasoning can be seen as governed by a set of constitutive rules. As stated in section 4, reasoning is an argumentative exchange among agents that consists of linguistic interactions. These linguistic interactions are subject to rules insofar as

some of those interactions are prohibited, but others are permitted, or even required. The sort of rules that guide linguistic interactions in reasoning have a double role: they define the activity of reasoning and, at the same time, they regulate that activity. As a consequence, these rules are constitutive. And, as constitutive rules, they also have a regulative dimension.

In the social process of reasoning, words with different illocutionary forces are uttered. Thus, these interactions in a reasoning framework consist of a series of speech acts. Arguably, as in the case of the speech act of promising, the speech acts employed in the course of a dialogue unfold obligations and prohibitions. In turn, this makes it explicit that the agents who are part of that dialogue ought to make, or are forbidden to make, certain speech acts. Therefore, for defining the very activity of reasoning, it is necessary to appeal to a set of constitutive rules. This is in line with the characterisation of reasoning as a social institution that I argue for. The activity of reasoning has to be in accordance with a set of constitutive rules for it to count for reasoning at all.

Logic has been characterised here as the theoretical reconstruction of the rules that guide linguistic interactions in the framework of a dialogue. From this characterisation, it follows that the logical facts described in logical rules (or in logical laws) can be understood as institutional facts, instead of brute facts. Thus, logical facts, as institutional facts, include their inherent obligations, prohibitions and permissions. Therefore, a logical fact not only establishes relations between truth-bearers but also states obligations for the agents involved in those reasoning processes. In other words, participating in a reasoning process entails a commitment to the constitutive rules of that social institution.

Consequently, it is possible to respond to the claim that the normativity thesis is based on a naturalistic fallacy. In the social naturalistic framework here developed, the premises of the argument for the normative status of logic contain both descriptive and evaluative elements. The main point of the argument relies upon the observation that logical facts are institutional facts. Logical facts do not only establish relations among truth-bearers but also institute statements about values regarding the linguistic interactions based on those truth-bearers. Thus, departing from a mere linguistic interaction based on a set of speech acts made by different agents, it is possible to derive normative consequences for reasoning without appealing to any extra general epistemic principle. Bridge principles make explicit reference to the obligations and prohibitions inherent to logical rules.

A final crucial consideration that warrants attention is the challenge presented by Lewis Carroll's paradox of inference (1895) to the normative force of logical rules. Given the profound philosophical implications of this topic, I will focus specifically on outlining a response to this paradox within the framework of the social naturalistic approach I have advocated. In essence, Carroll's paradox portrays a scenario involving a stubborn Tortoise who accepts the premises $\psi \rightarrow \phi$ and ψ but refuses to accept the conclusion ϕ. The Tortoise argues that to accept ϕ, it is necessary to first accept a conditional statement in the following form: "If ($\psi \rightarrow \phi$ and ψ are true), then ϕ is true." Achilles engages in the dialogue by allowing her to introduce this conditional as an additional premise, but the Tortoise proceeds to add another conditional statement: "If (($\psi \rightarrow \phi$ and ψ are true) and (if ($\psi \rightarrow \phi$ and ψ are true), then ϕ is true)), then ϕ is true." Thus, this pattern of adding a new conditional statement every time leads to an infinite regress (Besson, 2018; Engel, 2016).

Two important considerations arise in this context. Firstly, there is a widespread consensus among scholars studying this problem that adding a conditional statement as an additional premise is problematic. This move not only fails to compel the Tortoise to make

the inference, but also triggers the regress (Besson, 2019). Secondly, in the approach developed here, logical rules have been defined as constitutive and regulative for the social institution of reasoning. Agents involved in this type of activity share a common goal, and the means to achieve it is to engage in a reasoning process. During this process, certain speech acts are permitted, others are prohibited, and still others are mandatory. Consequently, if an agent has accepted $\psi \rightarrow \phi$ and ψ, and if *modus ponens* is an agreed logical rule in the context of that dialogue, then that agent is compelled to accept ϕ. Thus, regarding the behaviour of the Tortoise in Carroll's story, either the Tortoise is cheating, or she is not participating in a practice that can be considered genuine reasoning. In the first case, refusing to accept ϕ constitutes a violation of a rule which carries similar consequences to those of breaking a promise, as agents are bound by the observance of certain institutional facts in both scenarios. In the second case, her lack of commitment, and her refusal to cooperate, led to considering that she is not reasoning at all. Therefore, the activity the Tortoise is engaged in cannot count as reasoning.

6. Conclusions

In this paper, I have presented a defence of the normative role of logic with respect to human reasoning, from a social naturalistic perspective. The discussion began by addressing two criticisms against the normativity thesis: the sceptical challenge raised by Gilbert Harman, and the accusation of relying on a naturalistic fallacy made by Gillian Russell. I have provided a series of responses to the sceptical challenge by proposing the construction of bridge principles. However, it becomes evident that this line of response fails to address the criticism according to which a defence of the normative role of logic incurs a violation of Hume's law. Relying on an externalist characterisation of reasoning, I argued for a normative role of logic in the framework of dialogical interactions among agents. This perspective has led to the construction of dialogical bridge principles concerning both validity and invalidity. Furthermore, by defining logical facts as institutional facts that arise from a set of constitutive rules governing linguistic interactions, I have argued in favour of the intrinsic normativity of logic while avoiding the pitfalls of the naturalistic fallacy.

As highlighted earlier, this proposal is founded entirely on an externalist characterisation of reasoning, logic, and normativity. However, Steinberger (2019) has raised an important concern in response to Harman's sceptical challenge, suggesting the need for a justification that assigns a first-person directive normative role to logic. It is crucial to acknowledge that if the dialogical roots of logic fade away, establishing a connection between logic and human reasoning becomes difficult. From a purely internalist standpoint, it appears inevitable to rely on general epistemic principles external to logic to justify why an agent should follow logical rules for reasoning.

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Alba Massolo is an Assistant Professor at the Department of Philosophy of the National University of Córdoba, Argentina (UNC). She holds a PhD in Philosophy from UNC. Her research areas are the Philosophy of Logic and the Psychology of Reasoning. She is particularly interested in exploring the relationship between logic and human reasoning.

Address: Universidad Nacional de Córdoba, Centro de Investigaciones María Saleme de Burnichon (CIFFyH). Pabellón Agustín Tosco, 1.er piso, Ciudad Universitaria, Córdoba, Argentina. C.P. 5000. E-mail: alba.massolo@unc.edu.ar – ORCID: https://orcid.org/0000-0001-7690-8574