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Economics as a rhetorical language game

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Abstract

Purpose – This paper aims to argue that Economics is not a neutral science.

Design/methodology/approach – Post-structuralist perspective of Lyotard (1984), alongside the Pragmatics of Searle (1979) and Travis (1981) are useful for analyzing enunciations in mainstream Economics.

Findings – Economists use illocutionary acts expressed in formal language to achieve perlocutionary effects. Because of the importance attached to objectivity in mainstream Economics, the use of artificial languages is preferred to natural language. However, formal language is preferred regarding its perlocutionary effects on economists' community.

Originality/value – This paper puts together the Continental and the Analytical Philosophy and show, in an original manner, how their intersections and how they can be useful to better understand the epistemology of Economics.

Keywords Rhetorical economics, Philosophy of language, Mathematical formalism

Paper type Conceptual paper

1. Introduction

The Philosophy of Language has two main objects of study: (1) the regimented language of pure sciences and (2) the ordinary language. The first one was formalized by philosophers like Frege, Russel, Church, Tarski, Montague and Carnap (Leclerc, 2010, p. 50). Their main goal was to create a language for sciences that would be context-free, without any ambiguity. To achieve this, the use of words was framed by definitions. Each term definition represents one *type*. While each word can have different uses (*tokens*), its truth-conditional content is framed by the *type* that comes from. Therefore, *tokens* have the same semantical characteristics as their *types*. Because of that, there is no ambiguity and it is possible to apply classical semantics' T-scheme [1] to analyze a proposition's truthfulness. For formal language philosophers, ordinary language is not suitable for formulating scientific arguments because they are plentiful in ambiguities, embodied by indexicals, discourse modulations and figures of speech (metaphors, ironies – to name a few) (Leclerc, 2010, p. 50). Therefore, traditionally, pragmatics studies only ordinary languages, since this field was developed to analyze utterances, whose meaning was not literal (Searle, 1979). On the other hand, semantics could study formal and natural languages, reaching both the literal meaning of each enunciation.

Formal languages are typified by meaning insularity; in other words, propositions are like "brick walls": each piece has a stable meaning and shapes the whole. Natural languages, on

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the other hand, are characterized by an interactionist composition: the continuous interaction among words, meanings and pragmatic/contextual elements of the utterance shape the sentence meaning. Therefore, utterances in natural languages are like walls of sandbags, which can be reshaped depending on the current context of enunciation (Recanati, 2004, p. 132).

To analyze the semantics of natural languages, Austin (1962) and Searle (1969) developed the speech acts theory, which set the importance of illocutionary force. Even though the propositional content of the speech has been evolving since Ancient Greece, until Austin (1962), little was said about the force that modulates and determines the intentionality of utterances. In parallel, since Grice (1957), the pragmatics of natural languages has been built up as a nonliterality theory, in which a speaker's meaning could differ from a sentence's meaning due to the actual context of utterance. Searle (1979) calls this approach of pragmatics the "received opinion". In contrast to it, the philosopher states that every utterance is dependent upon background assumptions, which are contextual elements that give proper meaning to the actual sentence. Since then, contextualism has developed in pragmatics, the details of which will be presented in the second section of this article, in particular the theories of Searle (1979) and Travis (1981). For Travis (1981, p. 147), dependence on contextual assumptions entails the relativity of truth conditions. This, in turn, is opposed to Fregean semantics, which assigns a functional form to each sentence, such that its truth content could not change depending on the utterance contexts. Travis's (1981) perspective is inspired by Wittgenstein's *Philosophic Investigations* in which he defines the concept of language game. Each language game is shaped – and constantly reshaped – by the formation of life in which it is embedded, and each of them frames its truth-conditional content.

Language games theory is also used as a method by the post-structuralist philosopher Lyotard (1984, p. 9) to formulate his critique of representative epistemology [2] on which is settled the Modernist concept of Truth [3] (Benhabib, 1984, p. 104). It is thus possible to infer a link between Travis' contextualism and French post-structuralism. This connection will become clear in the next sections by contrasting the two philosophical approaches.

This paper consists of four sections. The first section introduces the theory of language games according to Lyotard's formulation on *The Postmodern Condition*. It also questions the relationship between knowledge and power following Foucault (1984) and Lyotard (1984). In the second section, the contextualism of Searle and Travis is introduced. Next, the paper shows how mathematical formalism has evolved inside Economics to become one of its main methodologies. The fourth section analyzes the rhetorical aspect of formalism (1994). Finally, the conclusion attempts to bring together Lyotard (1984), Foucault (1984) and Travis (1981), considering the perlocutionary impact of formalism in Economics.

2. Language games and *The Postmodern Condition*

Lyotard (1984) questions the distinction between regimented and natural languages. The first, used by scientific discourse, can be summarized as follows:

[...] an axiomatic is defined that includes a definition of symbols to be used in the proposed language, a description of the form expressions in the language must take in order to gain acceptance (well-formed expressions), and an enumeration of the operations that can be performed on the accepted expressions (axioms in the narrow sense). (Lyotard, 1984, p. 42)

According to the approach of Literalism in the Philosophy of Language and the perspective of the members of the Vienna Circle, the metalanguage of regimented languages is the formal logic (Lyotard, 1984, p. 42; Recanati, 2004). To refute this approach, Lyotard (1984) argues

that the incompleteness of the formal system of Arithmetic proved, by Gödel, shows that the logical system cannot be the universal language (the ultimate metalanguage). According to Curry (1950), a metalanguage is defined as:

When we study a language L as object language, we could of course make L up out of whole cloth. In practice, however, it usually happens that L is a segment of the U-language which we definitely circumscribe and agree to isolate from the U-language. We then invent certain technical terminology for referring to L, which terminology we adjoin to the U-language. This process of circumscription and isolation can go on further. The technical terminology, together with such elements from U as we need to make the statements about L which we want, will form a certain circumscribed segment of U which we can call an M-language. Such an M-language is what I propose we call a meta-language (Curry, 1950, p. 349)

A metalanguage is a set of terms used to study a segment of a language in use (“U-language”). In contrast to the Vienna Circle perspective, Lyotard (1984, pp. 42–43) states that the formal and mathematical logic is not the universal language in which every proposition can be expressed because the incompleteness of arithmetic shows that formal systems can be incomplete (which means, there are nonrefutable or nonverifiable propositions). On the opposite side, any enunciate can be expressed in ordinary language; hence, it is the actual universal language and the ultimate metalanguage. Like Lyotard (1984), Curry (1950) defends those regimented languages are bounded, therefore, as a metalanguage, they have a limited scope since they cannot be the metalanguage of ordinary languages: “[. . .] we can form metametalanguages, metametametanguages, etc., ad-lib. But a meta-U-language is not conceivable in the ordinary sense, because the U-language cannot be circumscribed exactly” (Curry, 1950, p. 349). Therefore, while the artificial languages are bounded, the natural ones are unbounded, and then it is conceivable to translate every formal enunciate into ordinary enunciations, yet the reverse is not true. For this reason, only the natural languages can fulfill the role of “metametametanguages”.

In addition to the potential incompleteness of formal systems, Lyotard (1984, p. 43) claims that formal languages are formulated from natural languages. This is another argument that supports the classification of natural language as the universal one [4]. The present paper concurs with Lyotard’s perspective that natural language is adequate to translate formal propositions. Therefore, it is appropriate to analyze the academic propositions of economics within a pragmatic approach, using theories and concepts originally formulated for the study of ordinary languages to scrutinize scientific discourses such as Economics and its rhetorical aspects.

The concept of language games developed by the second Wittgenstein provides a foundation to post-modern critics for structural isomorphism [5] (Lyotard, 1984; Gergen, 2000; Gerber, 1997). To clarify the concept of language games, Wittgenstein compares language to a chess game: (1) both are built by rules: “if there are no rules, there is no game” (Lyotard, 1984, p. 10); therefore, even an infinitesimal change in one rule means a modification of the entire game, (2) the rules are contractual, learned round after round by the players, (3) the performativity of the rules by the players is the source of game’s legitimation, and it is a vector of the game change, framing the next moves available for each player and then (4) every utterance is similar to a move on a chessboard (Glock, 1996, p. 193; Lyotard, 1984, p. 10). Each language game is based on a life form, e.g. on a cultural and social formation (Glock, 1996, p. 125). Hence, different life forms generate different language games. When a life form changes over time, the language game is adjusted. In contrast to structural isomorphism, which is based on a conception of truthfulness as a representation of objective reality, the concept of language game supports a contextual conception of truth, since each game frames its truth-conditional content [6] (Glock, 1996, pp. 124–126). Thus, for the second Wittgenstein, there is no absolute Truth, instead of it, there are many contextual truths. The plurality of

truth conditions is an idea supported either by post-structuralism or by contextualism (Travis, 1981; Susen, 2015).

However, contextualism and post-structuralism have different objects of study: the former is focused on the analysis of ordinary language, especially its pragmatic aspects; the latter emphasizes that science is a language game among others, even though it is a special language game with institutional rules and tight methods [7]. Besides, according to Lyotard (1984), even though modernist disqualification of Metaphysics, metaphysical narratives have been used for scientific proofs' legitimation since Plato [8]. When one applies verificationist or refutationist methodology to modern science legitimations' criteria, one uncovers that the narrative upon which science is based is unverifiable. This results in the Nietzschean nihilistic critique of modern science (Lyotard, 1984, p. 39). In place of metaphysical narratives, modernity has adopted the criterion of performance as the criterion of legitimacy for scientific theories: if a proposition is efficient and fruitful for commodities production or to prediction and control of nature, then it is legitimate (Lyotard, 1984, p. 46). In today's world, then, there is a close link between scientific activity and economic power.

2.1 Characteristics of scientific language game

Although the nihilist crisis of sciences is related to the problem of legitimation, Lyotard (1984, p. 27) claims that the scientific language game is considered superior to narratives in the Western world. While the language game of narrative is used in storytelling and the transmission of cultural heritage in traditional societies, the scientific language game exhibits a diachronic relationship between the past and the present: the past represents all the accumulated knowledge, while the present consists of innovative hypothesis which, if they contradict the bibliography, they must refute them (Lyotard, 1984, pp. 25–26). Thus, scientific knowledge follows a cumulative process that characterizes the metanarrative of progress.

The scientific language game is divided into two parts: on one hand, there is the research sub-game; on the other hand, the teaching sub-game. In research, the sender and receiver of messages are experts, and their conversation consists of a talk between equals. An expert is someone who knows the propositions that are considered true by the scientific community to which one belongs (Lyotard, 1984, p. 25). As an expert, the sender can say a true proposition and refute any contradictory utterance on the same subject. The receiver, in turn, can validate the hypothesis or refute it, and, to do that, it is necessary to have technical or theoretical knowledge of the subject area (Lyotard, 1984, p. 23). In contrast, on teaching sub-game, the master (also an expert) leads the students through the cumulated knowledge from their subject area (Lyotard, 1984, p. 25). While on the research sub-game the dialogical sender–receiver relationship occurs in the abstract, on the teaching sub-game, the receiver is a specific one; therefore, one must have some capacities, like intelligence, to assimilate the cumulative knowledge taught by the master (Lyotard, 1984, pp. 25–26).

About the messages' content,

1. Scientific knowledge requires that one language game, denotation, be retained and all others excluded. A statement's truth-value is the criterion determining its acceptability. Of course, we find other classes of statements, such as interrogatives ("How can we explain that ...?") and prescriptives ("Take a finite series of elements ... "). But they are only present as turning points in the dialectical argumentation, which must end in a denotative statement. (Lyotard, 1984, p. 25)

When the messages of scientific language games consist of denotative sentences, nonliterality is not accepted. The validation of prepositions derives from the assumption that the sender is telling the truth and can do that (she is an expert); also, the scientific community can refute or verify each proposition using the scientific method. Nevertheless, the question of how to prove the proof remains (the legitimation's problem elaborated by Lyotard (1984)).

In contrast, in the narrative language game, there is no concern for the legitimacy of the discourse: when a narrative is reproduced, the legitimization is given because it is possible to know it only if the sender has already been a receiver, who, in turn, is a potential sender in future (Lyotard, 1984, p. 21). Besides this, in narrative games, the denotative propositions are not favored instead of other kinds: there is, alternatively to scientific discourse, a plurality of illocutionary forces, where are mixed “notions of ‘know-how,’ ‘knowing how to live,’ ‘how to listen’ [*savoir-faire, savoir-vivre, savoir-écouter*], etc.” (Lyotard, 1984, p. 18). The illocutionary point, i.e. the purpose of the utterance, can thus be manifold in narrative language games: the discourse can aim the knowledge transmission, real transformation, normative evaluation, decision making, etc. Above all, narratives aim to convey the pragmatic rules that compose the social bond of the culture/community in context (Lyotard, 1984, p. 21). Conversely, if the expert could not make normative statements in the scientific language-game, there would be a significant gap between scientists and decision-makers. While the scientist aims for truth, the decision-maker aims to achieve justice with fair public policies and laws; Truth and fairness are not always aligned, although true propositions could and should support a fair political decision in modern society (Lyotard, 1984, p. 36). In Economics, such a gap implies the split between Positive and Normative Economics. Such dichotomy was created by Stuart Mill and Nassau Senior and was reformulated by Neville Keynes, Lionel Robins and finally by Milton Friedman, who has given it its most famous formulation. According to such a dichotomy, Economics is a positive science, based on an objective analysis of reality. Therefore, Positive Economics consists of denotative propositions about the economic world, and the economist should not prescribe policy, even though the politician should base the public policies on the results of Economics analysis (Blaug, 1992). In summary, Friedman (1966) states:

Positive economics is in principle independent of any particular ethical position or normative judgments. [...] Normative economics and the art of economics, on the other hand, cannot be independent of positive economics. Any policy conclusion necessarily rests on a prediction about the consequences of doing one thing rather than another, a prediction that must be based – implicitly or explicitly – on positive economics. (Friedman, 1966, pp. 4–5)

Hence, according to the mainstream, Economics is a synonym of Positive Economics in which denotation is privileged. Paradoxically, Lyotard (1984) claims that when the scientific discourse favors denotative propositions over the others – as Positive Economics does – science isolates itself from the other elements that compose social life on contemporary Occident and, because of that, it is evidenced that scientific discourse is a language game among others (Lyotard, 1984, p. 40). Hence, in the post-modern world, it is delegitimated the science role as the only vector able to reach the Truth [9]:

Take, for example, a closed door. Between “The door is closed” and “Open the door” there is no relation of consequence as defined in propositional logic. The two statements belong to two autonomous sets of rules defining different kinds of relevance, and therefore of competence. Here, the effect of dividing reason into cognitive or theoretical reason on the one hand, and practical reason on the other, is to attack the legitimacy of the discourse of science. Not directly, but indirectly, by revealing that it is a language game with its own rules (of which the a priori conditions of knowledge in Kant provide a first glimpse) and that it has no special calling to supervise the game of praxis (nor the game of aesthetics, for that matter). The game of science is thus put on a par with the others. (Lyotard, 1984, p. 40)

On proof’s legitimization problem, Lyotard (1984) argues the scientific language game’s legitimacy arises from communication interaction. In other words, the rules of the scientific game are valid because they come out of the scientific community’s praxis (Lyotard, 1984, p. 41). Since these rules are based on social institutions, they are difficult to change, but they are not immutable; moreover, they are constantly reformulated through the performativity of

the linguistic rule (Lyotard, 1984, pp. 15; 17). In other words, the scientific language-game has more rigid rules than others because of its strict methods. However, this does not mean that the rules do not change, but rather they are constantly changing through the creative appropriation of methods and theories by scientists.

Social life permeates academic activity. In the academic community, the social relations are mediated by language and the individuals are like atoms “placed at the crossroads of pragmatic relationships, but they are also displaced by the messages that traverse them” (Lyotard, 1984, p. 16), acting sometimes as a sender, other times as a receiver, but always keeping in mind their social performance and the balance of power. Therefore, in the dialogic interaction that characterizes language games, the individuals aim to improve their status quo through the alteration of game rules (Lyotard, 1984, p. 10). Although the academic rules of the game are crystallized in institutions, they can be changed through the linguistic practice of the academic community:

We know today that the limits the institution imposes on potential language “moves” are never established once and for all (even if they have been formally defined). Rather, the limits are themselves the stakes and provisional results of language strategies, within the institution and without. Examples: Does the university have a place for language experiments (poetics)? Can you tell stories in a cabinet meeting? Advocate a cause in the barracks? The answers are clear: Yes, if the university opens creative workshops; yes, if the cabinet works with prospective scenarios; yes, if the limits of the old institution are displaced. (Lyotard, 1984, p. 17).

Therefore, the rules of scientific language game (like the rules of any other game) have a static and a dynamic aspect, for they are the provisional results of political disputes within the scientific community that is also influenced by political battles happening outside academia. As the metaphysical narrative is replaced by communicative interaction as the source of legitimacy for scientific pronouncements, it becomes more likely to bloom alternative approaches and theories into the mainstream. If we accept this, it becomes evident that orthodox and heterodox approaches are equally valid: feminist and *queer* Economics are as legitimate as the mainstream. The prevalence of the last over the others is the provisional result of social disputes inside and outside Economics. The mainstream approach is thus the provisional winner, but it is by no means superior to the others and nothing but the balance of power prevents its future overcoming, for it is no more [less] legitimate or true than any other approach.

As economists, we share a common academic training, that makes us all part of the same life form, from which the language game of economics emerges. However, we have multiple identities, belonging to multiple communities and life forms at the same time (Bauman, 2004, pp. 36-37). Moreover, identities are not immune to social hierarchies (Bauman, 2004, p. 38). Thus, when a feminist or queer economist disputes Becker’s Model of family’s labor allocation [10], their perspectives threaten the dominance of Becker’s explanation, but unfortunately, they are still unable to undermine it: the mainstream is supported by the current power distribution, which favors male, heterosexual, white, western economists’ views. Therefore, the social groups’ disputes inside the scientific language-game bring to light that the science game’s rules rely on power relationships. This argument is supported by Foucault’s binomial knowledge-power, according to which there is no power without a regime of truth, defining what kind of enunciate is legitimate and what it is not (Foucault, 1984). A regime of truth is defined by a set of rules and procedures used to formulate hypotheses and test methods. It is embedded in the power relations in place on the community where the regime of truth is taking effect (Foucault, 1984, p. 74). Power relations thus legitimize knowledge production and its truth content, and knowledge, in turn, supports the existing power relations.

On the basis of Foucauldian view, modern science’s truth-conditional content is contextual because they are sensitive to actual power relations in post-industrial society. Thus, the rules

by which the truth content of scientific statements is judged change according to the struggles between social groups for political, social, economic or cultural supremacy:

There is a battle “for truth,” or at least “around truth” – it being understood once again that by truth I do not mean “the ensemble of truths which are to be discovered and accepted,” but rather “the ensemble of rules according to which the true and the false are separated and specific effects of power attached to the true,” it being understood also that it’s a matter not of a battle “on behalf” of the truth, but of a battle about the status of truth and the economic and political role it plays. It is necessary to think of the political problems of intellectuals not in terms of “science” and “ideology,” but in terms of “truth” and “power.” (Foucault, 1984, p. 74)

The regime of truth arises from the social interactions based on power relations, interactions mediated by language (Franks & Keller, 1996, pp. 34–36). In other words, from the social interactions, which are framed by language games, is derived a regime of truth, i.e. a dominant scientific method and truth condition.

Each society has its regime of truth, its “general politics” of truth: that is, the types of discourse which it accepts and makes function as true, the mechanisms and instances which enable one to distinguish true and false statements, the means by which each is sanctioned, the techniques and procedures accorded value in the acquisition of truth and the status of those who are charged with saying what counts as true. (Foucault, 1984, p. 73).

Based on this dependence of the truth regime on the prevailing political, economic, social and cultural context, it is possible to bring closer French post-structuralism and contextualism. For both, the conditions that enunciate must satisfy to be a happy one (in Austin’s terms) – or, in the case of a scientific proposition, to be a true one – depends on the context in which they are enunciated. That context, in turn, does not take place in a political vacuum.

3. Contextualism

In Philosophy of Language, pragmatics has been developed since Grice (1957), who distinguishes between the literal meaning of sentences and what the sender wants to say (speaker’s meaning) (Searle, 1979, pp. 117–118). When those senses do not coincide, there is non-literality on discourse, which is the traditional pragmatics’ object of study. In this perspective of pragmatics:

[...] the phrase ‘literal meaning of the sentence’ is pleonastic since all these other sorts of meaning – ironical meaning, metaphorical meaning, indirect speech acts and conversation implications – are not properties of sentences at all, but rather of speakers, utterances of sentences (Searle, 1979, p. 118)

Therefore, the main approach in pragmatics until Searle (1979) – called by him the “received opinion” – used to consider the literal meaning of sentences as a type, while any specific meaning conveyed by the speaker’s utterance is regarded as a token. Types are context-free, and their meaning and properties follow Fregean semantics. Tokens, on the other hand, vary according to the utterance context; however, their truth-conditional content remains constant as it arises from its correspondent type. To avoid contextual influences, it is necessary to make indexicals and any other contextual elements explicit in the sentence, isolating their sense (Searle, 1979, pp. 119–123).

In contrast to pragmatics as a non-literality theory, Searle (1979, pp. 125; 127) argues that the fulfillment conditions of any sentence are based on background assumptions, that cannot be spelled out properly because they are uncountable and moreover infinite. On this view, there is no context-free enunciative, so it is nonsensical to equate enunciatives to types and enunciations to tokens (Searle, 1979, p. 120). Therefore, in the literalism vs. contextualism debate, Searle (1979) supports the second instead of the first [11].

To illustrate his theory, Searle (1979) quotes the simple proposition: “the cat is on the mat”. Albeit this apparently trivial phrase, it can only be understood if we know first many background assumptions about each term: it is quite essential that there is a gravitational field to which something is located on another thing; also, it is important to delimit what a cat is, etc. (Searle, 1979, pp. 123–125). Even in everyday sentences like this, not all contextual assumptions can be expressed in the text, because they are infinite and, when you make some of them explicit, it becomes necessary to also express the assumptions of the contextual assumptions already made explicit. So, there is an infinite regression, and it is impossible to nullify the contextual influence (Searle, 1979, p. 128).

Searle (1979, pp. 129–130) criticizes the equation between pragmatics and the study of nonliterality. For him, every enunciate – even the seemingly literal ones – depends on the context, so that literal sentences are also subject to the study of pragmatics and are not restricted/confined to the semantics analysis. As an example, he quotes the literal phrases: “Give me a hamburger, medium rare, with ketchup and mustard, but easy on the relish” and “Shut the door” (Searle, 1979, pp. 127–128). Both of these are understood literally by English speakers, and they could be obeyed. However, on the other hand, they presuppose a context that delimits what is it to give a hamburger to someone else or what is it to close a door (at least, it must be an open door for this command to be obeyed) (Searle, 1979, pp. 128–129).

According to Searle’s theory, then, the literal meaning of sentences can only be understood and satisfied by considering the context. As before seen, science favors denotative propositions, i.e. the literal meaning of sentences. When Searle’s contextualism is used to analyze scientific propositions, it is highlighted that, even though they are considered literal sentences, they are not context-free, since they are dependent upon background assumptions, which remain implicit and whose complete-textual expression on sentences are not possible. It challenges the image of science – and, especially, Positive Economics – as objective, context-free discourse.

In *The True and the False: The Domain of Pragmatics*, Travis (1981) rejects the idea that only Semantics can analyze propositions’ truthfulness or falsehood. For him, truth is sensitive to the context of enunciation; hence, there is no zero-context where the enunciates can be judged true or false regarding only semantic factors. From this, Travis (1981) derives the idea that, instead of the absolute truth, there are contextual truths; therefore, analyzing the truthfulness/falsehood of propositions is also a pragmatics’ object of study. According to this philosopher, an enunciate is not associated with one, and only one fact (Travis, 1981, pp. 145). Even if the sentence describes an objective reality, it is sensitive to the context of enunciation and to the circumstances of the fact represented. Judging the correspondence between fact and reality is also contextually related. Hence, an enunciate can be true and false, depending upon the context (Travis, 1981, p. 146). A greater issue than that is the pointing out of relevant aspects of reality. Which aspects of reality are relevant, as well as the properties of true enunciations (i.e. their accuracy) depend on the context and the interests of the speaker or the audience (Travis, 1981, pp. 147–148; 151–152). Thus, “what is a crucial aspect of what was said on some occasions or for a certain purpose is not so for others, so that what counts as true on one occasion does not do on another” (Travis, 1981, p. 149) [12].

Apart from the context-dependence of scientific (literal) enunciates, since the impossibility of a null context and the myriad of background assumptions, the truth conditions of any proposition are relative and not absolute as semantics defends. Analogous to Foucault (1984), Travis (1981) emphasizes the properties that a true statement must accomplish (its accuracy) is not singular and defined all at once, which, in Foucauldian terms, means that the regime of truth changes according to interests and occasions, considering the political aspects always embedded in every social structure and relationship, conforming the microphysics of power (Foucault, 2014). Due to the context-sensitivity of statements and the microphysics of power, there is a political battle around truth conditions of scientific enunciates, and that corroborates

the thesis here asserted the scientific debate is a language game that follows the structure described by Lyotard: “to speak is to fight, in the sense of playing, and speech acts fall within the domain of a general agonistics” (Lyotard, 1984, p. 10). Therefore, the main goal of researchers is to change [maintain] the regime of truth, improving [preserving] their social performance. As a result, it becomes clear how rhetoric is important to economists’ profession.

4. The genealogy of economics as a context-free science

The mainstream claims that because economics uses formal language, even though it uses ordinary language, it achieves the goal of avoiding idiosyncrasies of the author and the context of the: “Science, they would say, avoids being Italian or English by being formal” (McCloskey, 1990, p. 4). In mainstream Economics, the regimented language reaches paroxysm thanks to mathematical formalism, arising from Hilbert’s thoughts (Mirowski, 1991; Punzo, 1991). In spite of the divergence between McCloskey (1990) and Blaug (1998), regarding methodology prescriptions, both criticize the formalism of recent economic research, advocating Economics should be more empirically oriented (or, in McCloskey’s terms, “more quantitative”):

The subject we economists really have been aping is mathematics. We have turned economics into a kind of social mathematics that employs words such as “price”, “market” and “commodity”. It looks like economics, but when you read an article that uses such words, all the relationships are mathematical relationships; all the inferences are mathematically drawn; and no thought is given to whether these mathematical variables, concepts, functional relationships bear any resemblance to real-world observation. Deirdre McCloskey [see Challenge, January-February 1997], whose writings I do not otherwise like, has said quite tightly that economists look to the math department, not the physics department. That is absolutely true. (Blaug, 1998, p. 39)

In place of mathematical formalism, Blaug (1998) argues that economists should follow Popperian empiricism. For McCloskey (1994), Popperian methodology as much as mathematical formalism is used by the mainstream for rhetorical purposes. As it has been stated before, scientific activity is a language game in which a battle occurs between different theories, perspectives and ways of life. Since “to speak is to fight”, Formalism or Popperian methodology [13] are rhetorical weapons used by orthodox economists to fight, and they are a source of legitimacy to economists’ arguments (McCloskey, 1994). Asserting a theory is tantamount to convincing others of the validity of your arguments. Therefore, each scientific enunciate is a rhetorical move (McCloskey, 1990, p. 4), or, in other words, it is a move on Economics’ language game chessboard.

The main goal of this section is to analyze the mathematical formalism used by mainstream Economics from a rhetorically oriented perspective. It was a research decision to focus just on mathematical formalism, despite the recognition that it is not the only method used by the mainstream, nor that Economics resumes itself to the mainstream. There is a myriad of methods, mainly if we talk about heterodox Economics. However, they will not be explored here. The first step in the study of mathematical formalism is to trace a genealogy of Math in Economics, highlighting the relevance of the “formalistic turn” to our subject area (Mirowski, 1991; Punzo, 1991). Secondly, we will be able to examine the consequences of formalism’s presence in mainstream discourse, especially its implicit rhetorical aspect.

4.1 The “formalistic turn” in economics

Regarding mathematization in Economics, Debreu (Mirowski, 1991, p. 153) considers it a natural move resulting from the vectors of prices and goods, which exhibit an isomorphism with Euclidean real metric space. In contrast to this view, Mirowski (1991) and Punzo (1991) highlight how the mathematization process in Economics was not natural but, rather, the

result of historical development. As what will be seen below, the mathematization has reached a peak with Arrow–Debreu’s general equilibrium model. This culmination would not be possible without the introduction of Mathematics in Economics first by the Marginal Revolution at the end of the 19th century, and, most importantly, by the formalistic turn propitiated by Vienna Circle’s ideas in the 1930s. Not only was the acceptance of Mathematical methods gradual, but also the isomorphism between goods’ vector and Euclidean real vector is not an automatic process, rather it is a result of historical context. [Mirowski \(1991, p. 154\)](#) sustains the aggregation of different kinds of goods is a product of Western contemporary society’s rationale: from an individual point of view, each good is unique, therefore the aggregation is a social, historical construct, rather than nature’s given [\[14\]](#). Moreover, the units of measurement in traditional societies are not uniform because they follow an anthropometric standard: “butter used to be quantified by the round; wool by fleece; honey by the hand” ([Mirowski, 1991, p. 155](#)). In this way:

[. . .] quantification is itself not an invariant in human history, even within the more limited subset of market organized structures. Prices in modern markets obviously conform to specific algebraic structures, but they are not the a priori products of nature or of the individual mind (through projection of completeness, reflexivity, transitivity, and so on upon preference structures); rather, they are provisional invariances imposed upon the motley variety of human perception by various conventions and social structures. ([Mirowski, 1991, p. 155](#))

If mathematization is not natural, then it is also not inexorable, but the result of social choices made by economists’ academic community. In [Lyotard’s \(1984\)](#) words, Math has become the main rule in mainstream language games as a result of battles that happened inside and outside the economists’ community. The genealogy of economists’ choice for Math will be explored in the next paragraphs.

Since 1870, there had been an influx of physicists and engineers to the field of study then called Political Economy. Those scientists have had common training in Newtonian Physics, which has influenced the equation of potential energy and utility ([Mirowski, 1991, p. 147](#)). A common training means they used to share a life form, which was determinant to the creation of language game’s rules based on Newtonian Physics. Some famous economists among them are Pareto, Walras, Cassel and Jevons, the main exponents of the Marginalist Revolution ([Punzo, 1991, p. 1](#)), which was the first step to Economics’ adherence to Mathematical vocabulary. Walras and Cassel were the first ones to develop general equilibrium models. In contrast to Arrow–Debreu’s version, in Walras and Cassel, the equilibrium was the result of a potentially observed state of a given economy, i.e. it was a state of affairs among others those real economies could reach if the conditions of the model were met ([Punzo, 1991, p. 7](#)).

Based on Cassel’s formulation, two models were presented and compared: one with economic growth and one without. In both, there are a finite number of factor services used in production. The growth of the entire economy is given by the factor whose growth rate is the slowest one. Given the number of factors of production, the economic growth rate is zero (model without dynamics). The primary problem describes the allocation of factors of production and equilibrium is reached when there is simultaneous equality in all markets ([Punzo, 1991, p. 8](#)). According to [Punzo \(1991\)](#), Cassel’s Model is based on an intuitionistic economic perspective, describing a specific economy, potentially observed. Apart from this, there is no guarantee that the Cassel equilibrium is a Pareto optimum (i.e. there is no guarantee of allocative efficiency). Due to these and other mathematical limitations, Cassel’s model was criticized on Vienna’s Mathematical Colloquium of 1927, giving rise to axiomatic general equilibrium models. Among these models, there are von Neumann’s, and, later, Arrow–Debreu’s general equilibrium model ([Punzo, 1991, p. 10](#); [McCloskey, 1990, p. 12](#)).

In light of [Punzo \(1991, p. 1\)](#), the Marginalist Revolution was not a definitive inflection point in Mathematical language adoption by Economics. [Mirowski \(1991\)](#) supports this idea

and shows that while the number of academic productions in Mathematical Economics has reached a peak in the end of the 19th century due to marginalist works, in the first decades of the 20th century, the number has plummeted considerably [15]. Therefore, even though the Marginalist Revolution has indeed introduced mathematical modeling in Economics, it did not become majoritarian until the 1930s. Whilst Newtonian Physics was the inspiration for marginalist economists, since Vienna's Circle, the inspiration became Hilbert's mathematical formalism (Punzo, 1991, p. 13). In response to the development of non-Euclidean geometry and to Gödel's critique of the incompleteness of arithmetic, Hilbert proposed that mathematical models should withdraw any Euclidian pretension to have an intuitive interpretation. Thus, the models would have no external foundations, but only internal logical grounds:

Hilbert's reaction to this crisis and to other mathematical events at the turn of this century indicated one way out: it was better to give up all Euclidian hope of assigning intuitive and empirical contents to models as scientific devices. Models and deductive structures had become coextensive. Then, for lack of anything better the external foundations, now missing, had to be replaced by the requirement of their forming a complete set of independent and coexistent axioms, and by metatheoretical principles to produce correct answers to theoretical questions generated from within the theory. (Punzo, 1991, p. 13)

Since Hilbert, each mathematical model is considered a universe apart, where their properties are defined by axioms, not being based on any kind of actual empirical reality. Hilbert's thoughts have influenced the 1930's economists' generation, like Ragnar Frisch, Tjalling Koopmans, Jan Tinbergen, Maurice Allais and Kenneth Arrow (Mirowski, 1991, p. 152). Mathematicians also began to study economics. Among them, von Neumann has applied combinatorial analysis and topological methods to demonstrate equilibrium existence with inequality for a set of games (Punzo, 1991, p. 9). The von Neumann's equilibrium existence proof was fundamental to the development, in the 1950s, of the Arrow–Debreu's general equilibrium model, which has become the canonical formulation to the modern general equilibrium theory.

In the modern general equilibrium theory, the main goal is to prove the existence of equilibrium and the efficiency of a given system of equations. For McCloskey (1990, p. 12), this new goal makes Economics less quantitative and more qualitative, as the main purpose is not to prove equilibrium results feasibility to an actual economy, but to prove an equilibrium feasibility to a blackboard economy, that is not and will never be real [16]. Therefore, since Vienna Circle and, more importantly, since Arrow–Debreu Model, mainstream Economics has moved away from Physics' language game instated by Marginalist Revolution, and it has moved closer to Pure Mathematics. In Physics, math is used only as a language to describe/predict empirical phenomena. If a theorem has no intuitive content, it is not relevant to such an academic community. In economics, on the other hand, concern for the empirical feasibility of a model is secondary to the formal elegance of the equilibrium existence of logico-deductive proofs (McCloskey, 1990, p. 16).

From everywhere outside of economics except the Department of Mathematics the proofs of existence will seem strange. They do not claim to show that an actual existing economy is in equilibrium, or that the equilibrium of an existing economy is desirable. The blackboard problem thus solved derives more or less vaguely from Adam Smith's assertion that capitalism is self-regulating and good. But the proofs of existence do not prove or disprove Smith's assertion. They show that certain equations describing a certain blackboard economy have a solution, but they do not give the solution to the blackboard problem. Much less to an extant economy. Indeed, the problem is framed in such general terms that no specific solution could reasonably be expected. [...] The proofs state that somewhere in the mathematical universe, there exists a solution. Lord knows what it is; we humans only know that it exists (McCloskey, 1990, p. 12)

With the consolidation of Arrow–Debreu’s general equilibrium theory, it has become a metatheory to all Economics. A metatheory describes the rules for validating endogenous variables and theoretical explanation (Punzo, 1991, p. 5), in a more allegorical way:

A metatheory is best understood as an empty container, i.e. a set of instructions as to (i) how to select undefined or primitive terms; (ii) how to combine them in well-formed formulas; (iii) how to obtain true propositions in the form of theorems via deductive reasoning. In other words, a metatheory is a handbook on how to handle scientific machinery correctly. On the other hand, there can be a unique metatheory for a whole set of theories, which belong to the different and lower (applied) levels of theorizing. Models, which are identified with theories in this jargon, are derived either via reinterpretation of primitive terms or via alternative, sometimes weaker, sets of specific assumptions (Punzo, 1991, p. 3).

In microeconomics, the general equilibrium theory has been the dominant metatheory since the mid-20th century. In orthodox macroeconomics, it has been consolidated as the dominant metatheory since Sargent and Lucas’ new classical agenda, which was developed at the end of the last century (McCloskey, 1990, p. 14). Currently, in the mainstream, economic theories are interpreted and classified as specific cases of Arrow–Debreu model. They are formulated through selective changes to the assumptions of the metatheory (Punzo, 1991, p. 3; McCloskey, 1990, p. 15). Therefore, the influence of the ideas of the Vienna Circle on the mainstream is obvious (the importance of formal logic and regimented language; their critics of metaphysics, etc.). Such influence corroborates the split between Positive and Normative Economics, as stated before.

According to McCloskey (1990, 1994), the general equilibrium theory cannot deal with cases that move away from equilibrium result. Moreover, since it is a logical mathematical model, it is exactly applicable and not approximate (McCloskey, 1990, p. 1). If an economy has a structure that approximates the equations of the model, but is not identical, can the general equilibrium results be applied? McCloskey (1990, p. 14) claims they cannot. Therefore, she advocates that Economics should be a more quantitative science, stating empirical approximative results. Roughly, if the equilibrium outcome is E , then it would be necessary to set quantitatively a ε [17] such that the model’s predicted results can be applied for the range $[E - \varepsilon; E + \varepsilon]$. However, this has been done neither by Arrow–Debreu nor by their followers. Unless the distance between the actual economy and the economy of the model equations is of an order of magnitude, the latter is empirically infeasible and therefore useless:

The theorems give some necessary and sufficient conditions for exact efficiency. But they do not tell how far from exactly satisfied the conditions must be to yield *approximate* efficiency. Since this is the problem, the Arrow, Debreu and Hahn theorems are irrelevant, except under the lamppost. (McCloskey, 1994, p. 154)

4.2 The rhetoric of mathematical formalism

From a post-modern perspective, no matter how formal a sentence is formulated, scientific enunciations always aim to persuade the academic community (Lyotard, 1984; McCloskey, 1990, 1994; Benhabib, 1984). Then, “A journal is where economists persuade. They persuade in beautiful figures of mathematics or of words or of statistics” (McCloskey, 1994, p. 111). In other words, the axiomatic language of the general equilibrium model is used as a rhetorical tool to convince.

According to the literary critic Burns (McCloskey, 1994, pp. 118–119), the obscurity of the Bible has the pragmatic function of convincing the audience and recruiting churchgoers. Similarly, the obscurity of mathematical formalism in Economics has the function of persuading audiences about the relevance of economic arguments and professionals. As one of the main rules of Economics’ language game, mathematical formalism is used to persuade

inside in community members, and, on the other hand, it provides a social status to economists as it makes our discipline a complicated subject for a lay audience:

The math is not all that difficult, although it does create an entry barrier. [...] The people who have been initiated now have a vested interest in taking the barrier seriously and paying attention to it and giving it high prestige. Otherwise, it would not serve as an entry barrier. So, after a while, they justify the entry barrier because they possess this elegant particular virtue or technique. After it is created, it justifies itself. I shall add one other thing to this: the enormous output of Ph.Ds in Economics in the United States (Blaug, 1998, pp. 39–40)

Since the spread of Arrow–Debreu’s general equilibrium theory as a metatheory for mainstream Economics, the implicit author of economic papers has been the mathematician (McCloskey, 1990, p. 114), leading us to question the classification of Economics as an applied social science. Does this categorization remain in force today? As Math is an entry barrier, the audience of economists’ texts has become a select and highly educated public (McCloskey, 1990, p. 118). The economists talk to this audience when they write a paper, which, even under the pretense of literality and objectivity of Positive Economics, still has a rhetorical aspect:

The formal methods themselves, I should like to argue, stand on hidden arguments, unspoken metaphors, unargued appeals to authority. [...] Economists do not cease to be rhetoricians when they hang weights of axiom and specification on their understanding, letting their scholarly business be done as if by machine. They are anyway human arguers (McCloskey, 1990, p. 6)

As well as Lyotard (1984), McCloskey (1994) claims that any enunciation stated using artificial language can be restated in ordinary terms, even though it can lose some concision in this translation process:

Jargon is an argument in a word, and sometimes, though not always, it is more concise than ordinary language. (Economists put a lot of store on arguments being “concise”; it is one of intellectual values they have adopted from mathematicians. [...] Much economic jargon, though, hides a five-cent thought in a five-dollar word. The tip-off is a Latinate choice of words. Thus “the integrative consequences of growing structural differentiation” means in ordinary English “the need for others that someone feels when he buys rather than bakes his bread.” And “current period of responses” means “what people do now”. (McCloskey, 1994, p. 119).

The use of a formal language instead of a natural language thus plays a dual role in the scientific argumentation process in Economics: it provides argumentative concision and the persuasion of the academic community. To convince the economist community, it is necessary to adopt the dominant language game, which is, increasingly, mathematical formalism. If the paper does not follow this rule, it probably will not be published as Nelson (1995) remarks:

The prototypical scholarly work in economics is an article that studies market behavior using sophisticated mathematics to formalize the model in a “theory” section, accompanied by econometric analysis of data in an “empirical” section. Few works in economics follow the prototype exactly—the “agent” may be a household, firm, or even a country, for example, instead of an individual, or the empirical work may be left “for further research” or be ignored entirely—but for a work to be accepted as “being economics” it must bear a family resemblance to the core model. [...] The less a work has in common with the prototype the more it will be considered to be “on the fringe” or “not economics at all.” [...] Papers that consist of “just words” are rarely recognized as “economics”—you might see them in the American Economic Review as presidential addresses, or in clearly suspect journals such as those that deal with history or philosophy. (Nelson, 1995, p. 21)

4.3 Perlocutionary effects of formal enunciations

According to the semantics of ordinary language Philosophy developed since Austin (1962), the smallest unit of a speech act [18] is the illocutionary act, which is composed of a

propositional content (P) and an illocutionary force (F) (Searle & Vanderveken, 1985, p. 1). The propositional content has developed since Ancient Greece but until Austin, almost anything has been said about the force that modulates and gives a sense to enunciations, i.e. the illocutionary force (Searle & Vanderveken, 1985, p. 7). Regarding the different kinds of force that the same enunciate can have, it can be classified in several manners: the same proposition can be an assertive, a commissive, a declarative, a directive or an expressive one (Searle & Vanderveken, 1985, p. 51). Besides the illocutionary act, there is the perlocutionary one, whose main goal is to convince audiences. The persuasion is then a perlocutionary effect of a speech act (Searle & Vanderveken, 1985, p. 11). It is on this point that we find the rhetoric concern of ordinary language semantics [19].

Disregarding the rhetorical role of scientific enunciates, they would be classified as assertive illocutionary acts since their illocutionary point is to represent “an actual state of affairs in the world of utterance” (Searle & Vanderveken, 1985, p. 37). However, as asserted before by this paper, and also by McCloskey (1990, 1994) and Lyotard (1984), the assertive illocutionary acts are used for a perlocutionary purpose. Since scientists – especially economists – conceal their persuasive interest under the guise of objectivity of formal language (McCloskey, 1990), the perlocutionary effects of speech are reached indirectly by the utterance of assertive illocutionary acts. As all scientific enunciate has a rhetorical content, the perlocutionary act of persuading the academic community (the audience) is inherent to the illocutionary act whose propositional content (P) is a theory or a conjecture or even a mathematical demonstration of the existence of equilibrium. However, not all the perlocutionary effects are intentional, because most of the scientists (and economists) are unaware of the rhetorical character of their formal enunciates:

But in addition to the illocutionary effect of understanding, utterances normally produce, and are often intended to produce, further effects on the feelings, attitudes, and subsequent behavior of the hearers. These are called *perlocutionary effects*, and the acts of producing them are called *perlocutionary acts*. For example, by making a statement (illocutionary) a speaker may convince or persuade (perlocutionary) his audience [...]. Perlocutionary effects may be achieved intentionally [...], or unintentionally (Searle & Vanderveken, 1985, pp. 11–12).

Benhabib (1984) criticizes Lyotard's (1984) alleged identification between illocutionary and perlocutionary acts. According to her, the French post-structuralist philosopher believes that the primary usage of language is perlocutionary and not illocutionary; therefore, he would have created confusion between illocutionary and perlocutionary acts (Benhabib, 1984, pp. 115-116). As mentioned above, in fact, from Lyotard's perspective, illocutionary and perlocutionary acts are simultaneous in scientific discourse; however, they are not confused. Probably, previewing critics like Behabib's one, Lyotard (1984) has asserted:

From the beginning of this study, I have emphasized the differences (not only formal, but also pragmatic) between the various language games, especially between denotative, or knowledge, games and prescriptive, or action, games. The pragmatics of science is centered on denotative utterances, which are the foundation upon which it builds institutions of learning (institutes, centers, universities, etc.). But its postmodern development brings a decisive “fact” to the fore: even discussions of denotative statements need to have rules. Rules are not denotative but prescriptive utterances, which we are better off calling metaprescriptive utterances to avoid confusion (they prescribe what the moves of language games must be in order to be admissible). The function of the differential or imaginative or paralogical activity of the current pragmatics of science is to point out these metaprescriptives (science's “presuppositions”) and to petition the players to accept different ones. (Lyotard, 1984, pp. 64–65)

Rather than confusing illocutionary and perlocutionary acts, Lyotard recognizes that the two are inseparable. Thus, following Lyotard's and McCloskey's ideas, we conclude that, when they interact with each other using the rules of Positive Economics' language game, the

mainstream economists persuade, indirectly, the audience through the performance of assertive illocutionary acts. The difference between mainstream and deconstructivist economists is that these make the rhetorical aspect of their speech acts explicit, rather than let it implicit as the mainstream does. This idea is quite opposite to Benhabib (1984), who claims that perlocutionary acts can only succeed if they are not textually explicit:

According to Austin, “the illocutionary act... has a certain force in saying something; the perlocutionary act... is the achieving of certain effects by saying something” (my emphasis). For example, in saying I would shoot someone, I threaten them (illocutionary act); by saying I would shoot them, I alarm them (perlocutionary). The consequences attained by an illocutionary act can be stated at the beginning of a statement in the form of an explicit intention, “I threatened to shoot him”; in the case of a perlocutionary statement, however, the speaker can only attain the desired effect as long as his or her intentions are not explicitly made part of the speech-act. If it is my goal to alarm someone, I do not begin a statement by saying “I want to alarm you that...” In this case my act would be illocutionary, and intended with the purpose of apprehending you about a certain state of affairs. (Benhabib, 1984, p. 115)

If an enunciation loses its perlocutionary effect when the persuasive intention is explicit, then discourses that openly use rhetoric – like McCloskey’s – would not be able to convince the academic community, and in this case, they would not even have been published (Lyotard, 1984, p. 63), since the first receiver of any academic text is the revisor (the first one to be persuaded). In McCloskey’s perspective, the academic community works through the exchange of arguments and mutual convincing. Because of that, conversely to Benhabib (1984), scientific enunciation is perlocutionary even if their rhetorical intentions are explicitly stated. Moreover, Benhabib (1984) is afraid of the relativism that post-modernism can potentially produce. She states in this regard:

[...] the agonistics of language can no longer distinguish between manipulative and non-manipulative uses of speech. The consequences of this position is that not truth alone, but all claims to validity are at best pious wished, at worst illusions fabricated to deceive. (Benhabib, 1984, p. 116)

Unlike Benhabib (1984), the post-modern perspective does not deny the exigence of truth criteria. However, there is not just one truth condition, but many, depending on the language games are taking in place (Travis, 1981; Lyotard, 1984). Additionally, recognizing the rhetorical aspect of discourse does not imply automatically an ethical valuation in the first place: the persuasion (or the “manipulation” in Benhabib’s words) is not aprioristically good, or bad. If we follow an approach closer to Habermas Philosophy, as McCloskey (1990, 1994) does, we will probably conclude that the exchange of arguments in academics is a positive thing. As she states: “If science is to cohere it must use the art of argument, and it is to be agreed upon by free people it must argue persuasively” (McCloskey, 1990, p. 4). If we take an approach closer to Latour Philosophy, for whom the academic works resemble mobilized armies, probably the power aspects and the hierarchical power issue inside the discussion framework will be more relevant (Pires & Fernández, 2020) [20]. Due to French post-structuralism Philosophy adopted here, this paper prefers the second approach.

5. Conclusion

Since the “formalist turn”, the regimented language in economics has moved away from the vocabulary of physics and toward Hilbertian mathematics (Mirowski, 1991; Punzo, 1991). The mathematical vocabulary was used by von Neumann and, later, by Arrow–Debreu to prove the existence and efficiency of the general equilibrium theory, originally formulated by the marginalist Walras. With Arrow–Debreu’s formulation, general equilibrium has abandoned the intuitionist content in favor of an axiomatic perspective, as Hilbert has recommended (Punzo, 1991). Due to its axiomatic character, McCloskey (1990, 1994) criticizes its adoption as a metatheory for mainstream Economics because in Arrow–Debreu model, there is no concern

about external consistency and applicability only with internal logic. It is therefore a qualitative rather than quantitative analysis and thus has no empirical value (McCloskey, 1990).

For the mainstream, context is irrelevant, and Positive Economics is a science that describes, explains, and – more importantly – predicts the ahistorical process of agents' utility maximization. For this reason, the approach to Philosophy of Language that has more adherence to the mainstream is the enunciations analysis made by classical semantics. However, as Lyotard (1984) and McCloskey (1990) emphasize, any enunciation expressed in regimented language can be translated into ordinary language. Therefore, it is appropriate to use natural language's pragmatics and semantics to analyze Economics, as it has been done before. Moreover, even formalist arguments have a rhetorical purpose (McCloskey, 1990, 1994); therefore it is not enough to study the illocutionary acts, being necessary to take a further step to intended and unintended perlocutionary effects of discourse. Recognizing the relevance of rhetoric to Economics implies for critics to objectivity pretension from the mainstream, thus the context is important to study the illocutionary force and the truth-conditional content of economists' enunciation, and there is no null context in which the economic enunciations can be examined without any historical and social concern. Besides, as Searle (1979) claims, all the sentences, even the simplest ones, have uncountable background assumptions. As sustained by Travis (1981), the pinpointing of relevant facts and arguments depends upon accuracy and relevance criteria that arise from the researcher and actual enunciation context. Similarly, the post-structuralists Lyotard (1984) and Foucault (1984) show the relevance of power relations to science, which is understood as a language game among others, whose legitimacy is derived from communicational interaction (the performativity of the governing rules of the game), or, in other words, from the daily and creative reproduction of the governing regime of truth.

Mathematical formalism is the current rule in the mainstream language game. The use of formalism lends legitimacy to research findings because it plays the rhetorical role of persuading the community of economists about the validity of the study (McCloskey, 1994). The legitimacy of the formalists' economic arguments ultimately derives not from the rigor of the method, but from the historical consensus that the community of economists has reached since the 1930s, as Punzo (1991) and Mirowski (1991) show. Communicative interaction does not take place in a power vacuum: there are many disputes inside the academy. In these disputes, groups that are favored in current power relations are the likely winners, enforcing their regime of truth and advancing the game's rules they prefer (Foucault, 1984). Then, a question that emerges is if Arrow–Debreu's general equilibrium model had been formulated by a black, transgender, non-heterosexual, nonwestern woman, even so, would this theory have become the metatheory for mainstream Economics? Probably not, because the binomial knowledge-power would not be favorable to that and it would rush to impose a new paradigm, or, in Foucauldian terms, a new regime of truth. The mainstream approach, then, is not orthodox by virtue of any theoretical superiority, as its supremacy derives from the social hierarchy that exists outside and inside academia and whose majority adherence silences any contribution that does not follow the rules of the language game.

Once the rhetorical role of mathematical formalism is recognized, its superiority is questioned. Therefore, other methods and nonmainstream approaches can be revalorized, as they are seen as legitimate as the mainstream contributions. They are then reintroduced into the language game of economics, enriching the debate, although the academic debate is not the exchange of persuasive arguments between equally free people. There are voices that are “freer” than others, that are listened to more often and more carefully.

Notes

1. The T-Scheme of Tarski sets all the situations [s], considered constant, where a proposition [p] is true. In other words, p is a true sentence if, and only if, s. For more details about the semantic conceptualization of truth, see Tarski, A (1983): Concept of truth in formalized languages, In: **Logic**,

Semantics, Metamathematics – papers from 1923 to 1938. Hackett Publishing Company: 152-278.

2. On the representational epistemology, to be classified as true, a proposition should mirror the reality, representing it with accuracy and elegance (Benhabib, 1984).
3. As McCloskey (1998), it is used “Truth” with capital-T to differentiate between contextual truths, which are multiples and derived from language games, and Truth in the modernist sense, which is absolute and unique, existing on reality, ready to be discovered by the researcher.
4. This notion is opposed to literalism, a current of thought inside pragmatics and opposed to contextualism, which claims that for each proposition sensitive to the context of enunciation, there is “an eternal sentence”, e.g. a context-free enunciate, which can be properly analyzed by semantics. Thus, for literalism, natural languages can be restated in formal sentences (Recanati, 2004).
5. On the modernist perspective, there is an isomorphism between reality and propositional content, which means the observer can describe the object of study, building a representation of it that mirror its essential characteristics. The renowned book of Rorty (1979), *The Mirror of Nature* criticizes precisely this point.
6. Foucauldian speaking, this means that each game has its own truth regime. This concept will be examined on next pages.
7. A broader difference between contextualism and French post-structuralism is the former belongs to the Analytical Philosophy tradition, which is hegemonic in English-speaking countries since Vienna Circle. On the other hand, as its name already indicates, French Structuralism belongs to Continental tradition, which is most common in Europe.
8. Metaphysical explanations are on the basis of science legitimation. This has been observed since the just beginning of Western Philosophy with Plato’s *Dialogues*, or, after, Descartes’ *Method Discourse*, for whom the God’s perfection is the last source of legitimacy of deductive propositions (Lyotard, 1984, pp. 28–29). On its more recent formulations, the modern science has two sources of legitimacy: the speculative spirit from German Idealism; and the emancipation ideal from Frankfurt School (Lyotard, 1984, pp. 32–37). Both narratives are considered insufficient by Lyotard (1984, p. 29) and a contradiction to Modernist spirit. For him, the legitimation criterion of scientific enterprise is the communicational interaction instead of Metaphysics.
9. It is important to notice that what is questioned is the aprioristic legitimacy of science to reach truth. It is not our purpose to defend a perspective of “anything goes”. Conversely, what is sustained is that scientific language game has not a priori legitimacy, just a posteriori one, which springs from the communicational interaction and the linguistic practice of scientific communities (Lyotard, 1984, p. 41).
10. Becker makes a model with Ricardian inspiration to explain and give economic rationality to women’s specialization on housekeeping and caring activities. On this model, women have comparative advantage on domestic labor, as they are less remunerated than men on market activities. Considering the family as a unitary agent, it is rational the specialization of women in housekeeping since this allows men to have more time to dedicate to their paid work, increasing the aggregate efficiency of the labor allocation inside families. Becker’s model is main point of divergence between mainstream and feminists/queer economists (Nelson, 2008; Badgett, 2008, p. 28).
11. According to literalism, the truth conditions of a sentence are given by semantics and types’ meaning. Therefore, they are independent of speaker’s meaning and of enunciation context (Recanati, 2004, p. 85). Conversely, contextualism supports the idea that the truth conditions are always dependent upon enunciation context, inasmuch as semantical elements of reference, quantification and predication are sensitive to context (Recanati, 2004, p. 84). Thus, without keeping in mind context, there would be no propositional sense. Literalism and contextualism are two opposite poles on a scale that measure the truth conditions’ sensitiveness to context. For more details about that debate, see Recanati (2004): From literalism to contextualism, In: *Literal Meaning*. CUP: 83-97.

12. On Economics, the relevance issue is highlighted by [Myrdal \(1970\)](#) as an argument against the objectivity of Positive Economics. According to him, without values, there is no fact, because it is not possible to prioritize and frame the object of research: “Sin valoraciones”, escribió mi difunto amigo Louis Wirth, con él que coincidía en estos asuntos, ‘no tenemos interés, o sentido de la relevancia o de la significación y consecuentemente la investigación no tiene objeto” [“Without values’, has written my dead friend Louis Wirth, with who I concur on these issues, ‘there is no interest, neither sense of relevance nor of importance, and, consequently, the investigation does not have an object”] ([Myrdal, 1970, p. 55](#); translated by the author).
13. As [Blaug \(1992\)](#) states, the Popperian refutationism is seen by mainstream as the ideal methodology which should be adopted. Therefore, academic papers that use the proofs and refutations methodology are more persuasive, and, rhetorically speaking, are more efficient in their messages’ transmission. This happens because they are more aligned to the rules of hegemonic language game and, consequently, to the regime of truth in force.
14. As an example, [Mirowski \(1991, p. 154\)](#) quotes that, from an individual point of view, oranges and apples could not be aggregated since they are different kinds of fruits. He questions critically how the metric space apples/oranges would be like. Also, according to him, each apple (and each orange) has its own characteristics that distinguish it from the set of apples (oranges). Hence, each good is unique on an individual perspective.
15. Regarding the percentage of pages on four main economic journals devoted to Math (*Revue d’Economie Politique*, *Quarterly Journal of Economics*, *Journal of Political Economy* and *Economic Journal*), [Mirowski \(1991, pp. 150–151\)](#) highlights an inflection in neoclassical Economics usage of mathematical discourse on the 1930s. From 1887 to 1924, the percentage was near to 5% on average, meanwhile on the 1950s the percentage has already increased to around 20% on average.
16. According to [McCloskey \(1990\)](#), as general equilibrium theorems are focused on logical-deductive existence proofs, they are qualitative and not quantitative, because they do not have empirical application:
None of the theorems and counter theorems of the general equilibrium theory has been surprising in qualitative sense. *But this is the only sense they have*. They are not quantitative theorems. They are mathematics without numbers, of great and proper interest inside the Department of Mathematics, but of no interest to quantitative intellectuals ([McCloskey, 1990, p. 13](#)).
17. From McCloskey’s thoughts, it is possible to infer that she would assert that is important to define an order of magnitude to ϵ that is context specific. In other words, she does not support that this infinitesimal constant should be the same for all economic actual analysis; rather, it should be specific to each context/issue examined.
18. A speech act is any initiative of human communication. This concept was introduced by [Austin \(1962\)](#), who main concern was the performative speech acts, i.e. enunciates that aim to change the reality (adjustment direction: enunciate-world). Besides the performative ones, there are other kinds of speech acts, depending on the actual propositional content and the purpose and realization ways of enunciation. The Speech Acts’ theory was deepened by [Searle \(1969\)](#) in *Speech Act: An Essay in the Philosophy of Language*, and, later, it received a logical formulation by [Searle and Vanderveken \(1985\)](#).
19. As was said before, if any formal enunciate can be restated on ordinary language, then it is appropriated to use the semantics developed to study natural language also to scrutinize economists’ discourse.
20. As asserted by [Pires and Fernández \(2020\)](#), many times McCloskey adopts an excessive optimism regarding the academic debate, considering it a public arena where free people debate and reach a consensus. This underestimates the unequal power distribution and the silence of minorities on academic life. [Pires and Fernández \(2020\)](#) concludes that McCloskey has a normative approach to rhetoric, describing how the debate should be, even though she admits that it is not like that. [...] In contrast to McCloskey’s approach, [Pires and Fernández \(2020\)](#) prefer Latour’s philosophy, which is considered by the authors a more realistic description of rhetorical activity. This paper concurs with them on this topic.

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Further reading

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