CRÍTICA. Revista Hispanoamericana de Filosofía. Vol. 57, No. 170 (agosto 2025): 199–221

DOI: https://doi.org/10.22201/iifs.18704905e.2025.1709

CONTINGENT A PRIORI TRUTHS: REPLY TO MY CRITICS

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I begin by expressing my deep gratitude to Emiliano Boccardi, Thainá Coltro Demartini, Nathan Salmon, Eleonora Orlando, Eduardo Villanueva, and Mario Gómez-Torrente for their insightful comments on my book. It is an honor that so distinguished a group of philosophers has engaged with my approach—indeed, their critiques will serve to clarify my positions and make explicit the sources of any disagreements.[1]

1. *Reply to Emiliano Boccardi*

Emiliano Boccardi raises three objections to my account. His first critique concerns what I call the "Philonous' Objection", which I develop in Chapter 4. Although he focuses on Nathan Salmon's critique of Kripke's contingent a priori cases (Salmon 2020, 1987, 1986), Salmon's is but one instance of a broader family of acquaintance-based objections (cfr. Plantinga, Donnellan, Soames). The core claim is that some form of *acquaintance* with the object designated—whether Neptune or the abstract length of one meter via visual contact with the standard stick—is necessary for *de re* knowledge. And if such acquaintance requires perceptual contact, then Kripke's examples cannot be genuine cases of contingent a priori truths but, at most, only of metalinguistic truths. Hence, they are far less philosophically interesting than Kripke maintained. This is why the chapters in which I discuss this kind of objections are called "Donnellan and the Acquaintance Requirement" (Chapter 3) and "The Experience Requirement" (Chapter 4). Since Emiliano focuses on what I

[1] I thank the Editor-in-Chief of *Crítica. Revista Hispanoamericana de Filosofía*, Prof. Santiago Echeverri, for the project of this book symposium. Research supported by grant 302913/2021–1 (CNPq, Brazil).

called "Philonous' Objection" in Chapter 4, I will also concentrate here.

In response to Plantinga's (1974) skepticism—where he imagines a baptizer who fixes the meter convention without any idea whatsoever of the meter stick's length—I argue that some notion of the stick's dimensions might indeed be required, but direct perception is not the sole route. For example, even if the stipulator has never seen or had any perceptual contact with the meter stick, he or she might have a notion that its length lies between 0.95 m and 1.05 m, and this might be enough for most sorts of application of the meter standard.[2] So, *direct* perceptual contact with the stick does not seem to be strictly necessary for a notion of the length of the stick.

But then I turned to the question of whether perceptual contact is *sufficient*. Imagine the baptizer having direct visual perception of the stick: does this perception provide an adequate notion of its length? Clearly, the notion acquired will depend on the perspective or distance from which the stick is observed—if viewed from very close, the stick may appear large; if seen from afar, it may appear small. This is a familiar phenomenon, famously examined by George Berkeley in *Three Dialogues between Hylas and Philonous*, where he argued that there is no such thing as the real length of a physical object. This is why I call it the "Philonous' Objection" in the book (since Philonous, in the dialogue, articulates Berkeley's position). One does not have to endorse Berkeley's denial of objective dimensions to recognize that the multiplicity of perceptual representations of a body's length raises challenges for views such as Plantinga's, which treat perception as sufficient for acquaintance with physical properties. This, then, is the Philonous' Objection, and I take it to apply equally to the positions of both Plantinga and Salmon.

Emiliano, however, argues that the Philonous' Objection fails to gain traction because it rests on an overly simplistic conception of perception.[3] His criticism is based on the idea that perception—unlike a mere flux of sensations—presupposes certain perceptual constancies. That is, even when we view the stick from varying

[2] To illustrate, I imagined a situation in which the baptizer has the stick inside a box that was never opened, so he or she never really saw or touched or had any direct perceptual contact with the stick.

[3] One small clarification: Emiliano interprets the Philonous' Objection as aiming to show that direct perceptual contact with the named object is neither necessary nor sufficient for knowledge. However, my intention was only to argue that it is not *sufficient*. What, in my view, demonstrates that perceptual contact is not necessary is the case of the meter stick that is never seen—the "stick-in-a-box" scenario.

perspectives and it appears to differ in length, there remains a stable element in our perceptual experience that allows us to form a unified sense of a single, consistent length rather than multiple conflicting ones.

I have the sense that more needs to be said about how perceptual stability is achieved in cases involving varying perspectives on the same object. But even if this notion of stability is further elaborated, I remain unconvinced that it can resolve the difficulties raised by critics such as Salmon. The supposed stability of perception, as I understand Emiliano's point, is grounded in the use of auxiliary perceptions or contextual parameters. However, these parameters themselves are also susceptible to variation, and thus the perception remains relative to the particular configuration of perceptual cues. Indeed, many optical illusions exploit this very fact—namely, that the parameter we treat as a constant may itself shift. Even granting that perception involves certain constancies—whatever their precise nature—there remains the persistent possibility of misapprehending length. It is well known that individuals may misperceive the dimensions of people or objects, as illustrated by numerous optical illusions.

It is also important to distinguish between the meter stick S as a concrete object and its length L as an abstract entity. While we can have direct cognitive access to S—we can see and touch it—no such direct access is available for L, which is not itself observable. Rather, our awareness of L is mediated through our perceptual and physical engagement with S. Even when we perceive or manipulate S, our grasp of L is inherently vague: what we perceive is compatible with a range of possible lengths within a certain margin of error. If we assume that S has a single, objective length, then the definite description 'the length of S' indeed refers to a specific magnitude. However, perception alone does not suffice to determine which magnitude that is.

In his later lectures on the contingent a priori, Kripke (1986) moves in a similar direction. He acknowledges that some notion of the referent is indeed necessary in order to legitimately claim *de re* knowledge of a stipulated proposition. However, he argues that the requirement of acquaintance represents the strongest—and indeed an excessively strong—form of this condition. It is possible, Kripke maintains, to have a sufficiently robust notion of the referent without being in direct epistemic contact with it. For example, in the case of Neptune, Le Verrier did not merely assign the name 'Neptune' to

DOI:https://doi.org/10.22201/iifs.18704905e.2025.1709 *Crítica*, vol. 57, no. 170 (agosto 2025)

an unknown celestial body; he also possessed extensive information about it—such as its predicted position at specific times and its compliance with the laws of Newtonian mechanics.

Emiliano's second critical point, as I understand it, is not directed specifically at my own account, but rather at most philosophical treatments of the topic. He argues that scholars often overlook the fact that (**M**) admits of two distinct readings. On the one hand, there is what he calls the *monadic* reading: by asserting that *S* is one meter long, we attribute to it a monadic property. On the other hand, there is also what he calls the *relational* reading, in which we attribute to *S* a relation to a physical object designated as the standard. While it is contingent that *S* possesses the monadic property of being one meter long, it necessarily bears the relation of being the same length as itself—i.e., the ratio of its length to its own length is necessarily 1:1. Emiliano suggests that the intuitive force behind contingent a priori truths like (**M**) derives from this ambiguity: we sometimes interpret (**M**) as ascribing a contingent property (under the monadic reading), and at other times as expressing a necessary truth (under the relational reading).[4]

I believe that Emiliano's alternative account, though intended as a critique of my own, is fundamentally sound and, as far as I can see, compatible with the position I advance. However, it has at least one shortcoming (although, I believe, it can be fixed). On his view, contingent a priori truths can be formulated for virtually any object whatsoever, not merely for those designated as standards of measurement. Indeed, for any object *a*, the following two statements are both true and may be interpreted as monadic and relational readings of the same content:

[4] This resembles Evans' (1979) suggestion that the same content can correspond to two distinct propositions. For example:

(i) John is as tall as John

(ii) John is as tall as himself

In (i), the sentence attributes to John a property that only some objects have—namely, the property λx(x is as tall as John). In contrast, (ii) attributes to John a property that any object necessarily has—i.e., λx(x is as tall as x). Thus, the two sentences exhibit distinct modal profiles. However, Evans' account (and, I suspect, Emiliano's as well) presupposes a separation between the semantic content of a sentence and its modal profile. I believe this assumption requires further justification, especially since it undermines the intuitive connection between a sentence's cognitive content and the counterfactual reasoning we typically associate with it.

> *a* has the same size (or age, or temperature, or color, etc.) as *a*
>
> *a* has the same size (or age, or temperature, or color, etc.) as itself

This implies that the class of contingent a priori truths on Emiliano's account is vastly larger than the one admitted by my own framework. While this is not, in principle, problematic, the majority of such truths appear to have no practical relevance within our linguistic or scientific practices.

Emiliano's third criticism goes to the heart of my account and sheds light on some fundamental aspects of measurement statements. As I argue in the book, (**M**) expresses the content of a performative or declarative illocutionary act. If the act is successful, it brings about the truth of its propositional content.[5] However, facts brought into existence through declarative acts can only be, in Searle's terminology, institutional facts—since language alone cannot alter physical properties. (Only a divine utterance such as 'Let there be light' would have that capacity.) Emiliano raises the concern that this view appears to carry the prima facie counterintuitive consequence that the length of objects—such as the meter stick—is a socially constructed fact rather than a brute fact, as one would expect.

This point is important, and it requires a nuanced distinction. The fact that the stick has a particular length is indeed a brute fact. Some confusion may arise from the observation that the meter stick is a manufactured object, whose dimensions were designed to fulfill a specific purpose. To neutralize this potential source of distraction, let us suppose that the stick was discovered in nature exactly as it is—not manufactured, but selected from among naturally occurring objects (e.g., rocks or metal rods) as suitable to serve as a standard of measurement. Moreover, imagine that this stick was formed in nature long before the existence of humankind, and remained buried until someone—later designated as the stipulator—found it and adopted it as the standard. In this case, the fact that the stick has a certain physical dimension is as brute as a fact can be, since it arose independently of any institutional framework or human intention.

But now we are attempting something different: we want to do science, to report the length of this particular stick. To do that, we must assert something like:

[5] Actually, I argue that there are two distinct propositional contents, yielding two distinct but related acts, that I call (**M***) and (**M****).

- The length of this stick is x units of length.

However, the expression 'unit of length' cannot refer to anything given by nature as a brute entity; it must be the result of a stipulation. Thus, an institutional fact must be presupposed when we move from the brute fact that the stick has a given length to the *scientific report* that it has that length—because the act of reporting depends on a prior stipulation of units. If we conceive of science as essentially involving measurement, we must recognize that no scientific report of brute facts can occur without the antecedent establishment of institutional facts. This is not to deny the existence of brute reality independent of institutional reality; rather, it is to say that the scientific description of brute reality requires a framework of primitive institutions—language itself being one, and systems of measurement another.

2. *Reply to Thainá Coltro Demartini*

Thainá Coltro Demartini argues that even if, as I claim, stipulation is a special kind of illocutionary act that grants the stipulator a certain epistemic privilege, this is still not sufficient to ground contingent a priori *de re* knowledge. A minor correction is in order: Thainá misrepresents my position by suggesting that I identify the truthmaker of a contingent a priori truth with the felicity conditions of the relevant speech act. That is not my claim. Following Austin, I maintain that felicity conditions are the preconditions that must obtain for a propositional content to become a fact by means of a declarative illocutionary act.[6] What I think to be correct: when we inquire about the length of the meter stick, we are able to provide an answer without undergoing the empirical process typically required in other cases—namely, measurement. The justification, in this case, lies solely in the fact that the proposition results from a (successful) stipulation—hence, from a successful declarative illocutionary act. Now, the effect of a declarative act is not to alter any physical property of the world but to bring about a specific kind of fact: an institutional fact. In the case of the meter stick, the institutional fact is that the stick is one meter long. This sets the case apart: the sort of empirical experience normally required (i.e., measuring the object)

[6] Another small clarification: she quotes a passage from the book (pp. 183 ff.) and asserts that declarative speech acts have a word-to-world direction of fit (in Searle's terminology). However, in the book I explicitly follow Searle's taxonomy, according to which declarative acts possess a double direction of fit, not merely a word-to-world one—thus differing, for example, from directive acts.

is not necessary here. That is precisely why we say that the length of the stick can be known a priori. Of course, in order to know whether the stipulation has been successfully executed, we must ensure that certain felicity conditions are satisfied—for instance, that the stick exists, that it has a stable length, that the stipulator performs the act intentionally and competently, etc. These are indeed matters of empirical knowledge. However, the fact that empirical knowledge is required to establish the success of the stipulation should not lead us to conclude that the knowledge resulting from the stipulation is itself empirical. If that were the case, then no a priori knowledge would survive, since all standard instances of a priori knowledge rely to some extent on empirical background conditions. For example, in order to know the proposition expressed by '2 + 2 = 4', one must understand that the content of '2' refers to the number two, that the content of '+' denotes the addition operation, and that the second occurrence of '2' co-refers with the first. These are all empirically acquired elements of linguistic competence. Yet the justification for the proposition expressed by '2 + 2 = 4' appeals not to this background knowledge, but to the conceptual content of the proposition itself. The same applies in the case of definitions: while empirical information is required to verify the success of a definition, this information does not enter into the justification of statements that rely on that definition—for example, in a formal proof. What justifies our use of the proposition, rather, is the fact that it was successfully introduced via a definitional stipulation.

Thainá, as I understand, seems to raise two main objections. The first is that the declarative speech act I take to underlie Kripke's cases presupposes *de re* knowledge of its propositional content. Her disagreement does not seem to lie with my approach in terms of a declarative act *per se*, but rather with the epistemic criteria she assumes for *de re* attitudes. In footnote 4, she states that she follows Kripke's understanding of *de re* beliefs as "beliefs about a particular person or object". However, throughout her paper she appears to adopt a significantly more demanding view than Kripke himself—namely, one that, following Donnellan and Salmon, requires some form of direct epistemic contact or acquaintance with the referent. This suggests that she is implicitly endorsing an acquaintance-based account of *de re* knowledge—an account that has been subject to sustained critique by figures such as Kaplan (1977), Hawthorne and Manley (2010), and Jeshion (2010). In doing so, she re-situates the discussion within a familiar and somewhat stagnant battleground: that between acquaintance theorists (e.g., Donnellan, Salmon, Soames) and so-called in-

DOI:https://doi.org/10.22201/iifs.18704905e.2025.1709 *Crítica*, vol. 57, no. 170 (agosto 2025)

strumentalists (e.g., Kaplan, Hawthorne and Manley, Jeshion). However, it was precisely this dispute that my illocutionary approach was designed to circumvent. In my view, both camps miss the core issue by failing to treat descriptive reference-fixing as a distinct illocutionary act, separate from ordinary assertions.

Thainá repeatedly asserts that *de re* access to *S*, or to any other instantiation of the abstract property of being one meter in length, is a necessary condition for forming an operational concept of one meter—that is, she takes direct perceptual contact as required. I can see at least two responses to this claim, one straightforward, the other more substantive. The straightforward response is that one can form an operational idea of one meter without any contact with *S* or with any other instantiation of that length. For example, one might perceive a stick that is half the length of *S* and mentally double its size, or perhaps even imagine such a length purely abstractly. (Why not, after all?) The more substantive response comes from the consideration of a concept like a light-year: we are able to perform complex inferential operations with this unit of length, despite never having had epistemic contact with anything remotely that long.

According to Thainá, my account presupposes that, in performing the declarative act that brings about a contingent a priori truth, the speaker must already possess *de re* knowledge of the propositional content. I am not sure I make this presupposition. On the contrary, I am inclined to agree with the instrumentalist position, which adopts a more liberal conception of *de re* epistemic attitudes. I also endorse Kripke's (1986) later view that acquaintance is merely one—albeit the strongest—way of having some grasp of the object of reference, but not the only one. One may have an operational or inferential grasp of the object without any direct epistemic contact.

Thainá's second main objection targets my claim that the truthmaker of a contingent a priori truth is an institutional fact. She argues—drawing on Salmon's critique of Kripke—that there exists an explanatory gap between knowledge of institutional facts and knowledge of the natural facts concerning the physical components that underpin them. (Her example involves the distinction between knowing about the existence and role of the Supreme Court, and knowing about its individual members.) I do acknowledge that there is an explanatory gap. However, I fail to see how this constitutes an objection—either to Kripke or to my reconstruction of his view. The existence of such a gap is entirely compatible with the existence of contingent a priori truths. If I know a priori that the meter stick

is one meter long, I am obviously not claiming to possess complete knowledge about the stick—such as its molecular structure, temperature, or origin. The explanatory gap is to be expected, precisely because the scope of a priori knowledge in this context is limited to the stick's length. The same applies to institutional contexts: if I know a priori that a particular institution holds a specific status (e.g., that it is the supreme judicial authority), there may still be numerous empirical facts I do not know—such as the physical location of the institution, the identities of its current members, and so forth. I therefore do not see why the presence of an explanatory gap should be viewed as problematic. On the contrary, it is a natural consequence of the fact that a declarative speech act establishes only certain institutional properties, and does not determine all features of the entity involved.

3. *Reply to Nathan Salmon*

Nathan Salmon's reply is a response to my criticism of his objections to Kripke, as developed in several of his texts (Salmon 2020, 1987, 1986). I should begin by acknowledging that Salmon's work forms part of the canonical literature on this topic, and it was a major source of inspiration when I first became interested in Kripke's cases. However, I eventually came to the view that Salmon—along with other critics such as Donnellan and Soames—did not pay sufficient attention to the fact that stipulations, from the illocutionary point of view, are fundamentally distinct from ordinary assertions. This oversight is, I believe, why they assimilated Kripke's examples to Kaplan's indexical cases, which involve mere assertions of indexical-containing sentences, rather than genuine stipulations.

Salmon operates with a notably restrictive conception of the a priori. As he puts it: 'a true statement is a priori iff, where p is the proposition expressed, it is humanly possible to know p independently of any reliance on experience and instead entirely through rational reflection (such as is employed in the proof of a mathematical theorem)'. This standard is so strict that, arguably, no proposition qualifies as knowable a priori, since all knowledge requires—at some level—empirical presuppositions, such as understanding the meaning of symbols and assuming the consistency of their repeated use. Even mathematical proofs would fall short, insofar as they presuppose empirical capacities like memory. Some philosophers, such as Chisholm 1977, accept this skeptical outcome. Others, like Bonjour 1998 (following Kant 1787), propose a more liberal conception of a priori

knowledge: some experiential input may be needed to understand a proposition, but once that understanding is achieved, if no further empirical input is required, the knowledge remains a priori. On my interpretation of Kripke's cases, some experience is indeed needed to verify that the felicity conditions of a declarative act are met; but once these are in place, no further experiential input of the relevant kind is necessary.

As I understand it, Salmon advances two main claims in his response. The first addresses my criticism of his view (posed against Kripke) that, in order to have *de re* knowledge of an abstract length *L*, one must either have direct contact with a physical object instantiating *L* (e.g., a stick), or with *L* itself. I challenged this assumption by drawing on what I called "Philonous' Objection", explained in my reply to Emiliano, i.e., direct contact with a stick does not yield a single, stable idea of its length, since perceptual impressions vary with perspective. Salmon replies that 'at least under appropriate circumstances, it is nevertheless the very same length that the reference-fixer sees, despite its differing appearance'. But this notion of 'appropriate' is inherently relative to context, purpose, or interest—and it remains unclear what precisely constitutes the 'appropriate' circumstances for *de re* epistemic contact with a length. From which spatial perspective or perceptual condition must one view the stick in order to secure the required epistemic relation?

Moreover, I see no compelling reason to restrict *de re* knowledge to middle-sized, directly perceivable objects. As I previously argued in my response to Thainá, we commonly refer to and reason with abstract or physically inaccessible magnitudes, such as one light-year, without requiring direct epistemic contact with any object of that length. Light-years are clearly beyond our perceptual capacities, yet we can rigidly designate and operationally employ such measures, just as we do with the meter. Similarly, I can undoubtedly refer to and form thoughts about the number of sand particles in the Sahara Desert. But does this mean that I cannot have *de re* thoughts about that number unless I achieve something physically impossible—namely, direct epistemic contact with the aggregate (which is empirically unfeasible) or with the number itself (which may be metaphysically impossible)?

Salmon's second claim is that the fact that (**M**) results from a verbal stipulation is irrelevant to its epistemic status. This, I believe, marks the core of our disagreement. In my view, Salmon—along with many other contributors to the debate—fails to adequately recognize

that stipulations are not equivalent to ordinary assertions: they have a different illocutionary point. Consequently, the epistemic status of (**M**) cannot be assessed as if it were the result of a standard assertion. To treat it as such is to overlook the performative element through which (**M**) acquires its truth, and thus to miss what is epistemically distinctive about contingent a priori knowledge grounded in stipulation.

4. *Reply to Eleonora Orlando*

Eleonora Orlando is, I believe, correct in her assertion (footnote 1) that the presence of perceptual contact with the object named in a baptism does not preclude the knowledge thereby attained from being a priori. She is right because this distinction reinforces—just as I emphasized in the book—the separation between knowledge of the felicity conditions (e.g., of a baptism) and the knowledge that results from the baptism itself. Furthermore, this distinction allows us to bypass, as was my intention in the book, the difficult question of what constitutes genuine *de re* epistemic states.

Eleonora also raises the point that my focus on the meter stick and the Neptune case may seem unjustified, in the sense that any structurally similar example could serve the same illustrative function. Again, I agree. I retained these examples largely due to their prominence in the literature. Nevertheless, it is philosophically important to include both types of cases: one in which stipulation successfully fixes a standard (as in the meter case), and one in which stipulation cannot directly fix natural properties (as in the Neptune case).

Eleonora further suggests that, from an Austinian perspective, it is unnecessary to assume, as I did, that an utterance of (**M**) performs an illocutionary act (**M***) with merely metalinguistic import and, derivatively, *another* act (**M****) with institutional import. She contends that both acts may be performed simultaneously—that is, an utterance may have metalinguistic content and, in appropriate contexts (e.g., scientific practice), institutional force. I believe she is right, and I take this as a welcome and compatible refinement of my account.[7] Indeed, her suggestion seems to echo an idea already

[7] However, I do not see why she takes this plausible claim to follow from the fact that, according to Austin, the performative verb does not contribute propositional content—unlike, for example, in Searle's account of performatives. The plausibility of her point does not appear to hinge on any assumption about the semantic role of the performative verb.

DOI:https://doi.org/10.22201/iifs.18704905e.2025.1709 *Crítica*, vol. 57, no. 170 (agosto 2025)

present in Austin.[8] What I sought to provide in my own account was, in a sense, an X-ray of the illocutionary structure behind acts of stipulative definition—an analytical separation of stages that, as Austin and Eleonora imply, ordinarily occur together. This, however, does not imply that there is no difference in illocutionary success between (**M**) and (**N**): while both (**M***) and (**M****) may be successfully performed together in the meter case, in the Neptune case, only the metalinguistic act (**N***) succeeds. The institutional component (**N****) is absent, since the act does not bring about the referential or descriptive success that would confer institutional status.

When Eleonora writes that 'from the introduction of the name, the scientific community, and, by the division of linguistic labor, the community as a whole become entitled to use a new measurement system *or to count on the existence of a new planet*' (my italics), I agree with the first part but not with the italicized portion, since the existence of a planet cannot possibly be the result of a declarative act. Eleonora argues that there is no relevant difference between the meter case and the Neptune case, as in both instances the speaker performs two illocutionary acts in one—represented by (**M***) and (**N***), respectively. However, this cannot be correct in the Neptune case. She notes that, in both examples, a felicity condition for the act is the scientist's authority, which confers a normative dimension to the resulting declaration. Yet in the Neptune case, as Donnellan rightly pointed out, this normative force is merely linguistic: it is improper for me to call her 'Claudia' if she was baptized 'Eleonora'. But no scientific practice depends on this norm. By contrast, in the meter case, the normative dimension extends beyond language: it involves not only naming the unit 'one meter' rather than 'one peter', but also establishing that this unit should serve as the basis for scientific measurement. Eleonora further claims that while the meter baptizer creates an institutional fact, the Neptune baptizer merely

[8] In his essay "Truth" (1950), Austin draws a parallel between the expressions "the fact that" and "define", noting that both are typically employed in contexts where the distinction between language and world is intentionally blurred:

> [A]lthough we may sensibly ask 'Do we ride the word 'elephant' or the animal?' and equally sensibly 'Do we write the word or the animal?' it is nonsense to ask 'Do we define the word or the animal?'. For defining an elephant (supposing we ever do this) is a compendious description of an operation involving both word and animal (do we focus the image or the battleship?); and so speaking about 'the fact that' is a compendious way of speaking about a situation involving both words and world (p. 118).

discovers a preexisting astronomical fact. But I would resist describing any result of a declarative act as a "discovery". "Discovery" usually characterizes a cognitive or epistemic relation to something language-independent, but the illocutionary point of a declarative act is creation, not discovery. The identification of a planet cannot be the consequence of a declarative act, though such an act may presuppose the satisfaction of its felicity conditions, which may be empirical and, hence, discovered.

Eleonora makes an additional observation about my explanation of how speakers other than the original stipulator might come to possess contingent a priori knowledge by being illocutionarily committed to future assertions. If I understand her correctly, she suggests that the normative dimension of the original stipulation extends beyond the commitment to future *assertions*—it may also involve other types of speech acts, such as giving orders, expressing emotions, or engaging in other practices that, in various ways, reflect or uphold the stipulation. Although this suggestion would benefit from further elaboration, I believe she is essentially right, and her proposal represents another valuable improvement of my account. My focus on assertions was motivated by their central role in traditional conceptions of knowledge, but she is correct to note that knowledge can also be manifested through other linguistic or practical engagements beyond the mere stating of truths. She also rightly observes that, when I discussed the idea of a declarative act committing the speaker to future acts, I was, following the passage from Austin cited in that context (p. 194, footnote 19), primarily thinking of definitions. However, I did not intend to suggest that only definitions have this normative dimension. Nor did I mean to 'conceive of all declarations in the model of definitions', as she criticizes. Rather, I took definitions as a paradigmatic instance of declarative acts within scientific discourse—without implying that they exhaust the category.

Eleonora's final remark is that a declarative act can be successful without thereby bringing about a new truth. She draws on Sainsbury's example of descriptively introduced names such as 'Vulcan', which fail to refer—because the corresponding description fails to pick out any entity—but nonetheless give rise to a stable naming practice. I believe this example is misconceived and does not support her conclusion. The illocutionary point of a declarative act is to bring about the truth of its propositional content; thus, a declarative act that fails to do so cannot be considered successful in the relevant sense. Rather, such cases should be seen, following Austin, as misfires: the act is performed, but one or more felicity conditions

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(e.g., the existence of the described object) are not met. That said, a misfire may still generate a secondary linguistic practice—'Vulcan' and 'aether', for instance, are commonly used in examples of failed scientific theories or in discussions in the philosophy of language. But these uses are distinct in purpose from the original referential function intended in scientific contexts.

5. *Reply to Eduardo Villanueva*

In the book, I develop a defense of Kripke's cases of contingent a priori truths grounded in the illocutionary dimension of stipulations. A crucial difference between my approach and Kripke's original formulation lies in the emphasis: whereas Kripke places significant weight on the semantic properties of proper names—regarded by him as rigid designators—and on definite descriptions typically used in reference-fixing—which he considers to be, in general, non-rigid—I focus instead on the fact that stipulations must be understood as declarative speech acts. These acts are fundamentally distinct from ordinary assertions, insofar as they possess a different illocutionary point. Much of the literature on Kripke's cases of the contingent a priori overlooks this dimension, often treating the sentences expressing such truths as if they were merely ordinary identity statements.[9]

Eduardo Villanueva agrees with me that Kripke's cases involve, in some sense, declarative speech acts. He also concurs that the outcome of such acts must be institutional rather than brute facts. However, he argues that, precisely for this reason, no genuine case of contingent a priori truth can be found. His argument, as I understand it, proceeds in two main steps, which I address in turn.

The first step consists essentially in the claim that justification for knowledge of institutional facts depends on knowledge that the preparatory conditions for the relevant speech act have been fulfilled. But this, Eduardo maintains, is and remains essentially empirical knowledge. Hence, he concludes, the outcomes of stipulations must be cases of contingent a posteriori knowledge. The first part of this claim is certainly correct: numerous conditions must be satisfied for a declarative act to be successful. In the meter case, for instance, there must exist a stick with a reasonably stable length; the utterance must accurately reflect the speaker's intentions (and not be, for example, the result of a spoonerism); the stipulator must have the appropriate

[9] Two notable exceptions are Horowitz 1983 and Stalnaker 2022, although they arrive at opposite conclusions regarding the epistemic status of Kripke's cases.

institutional role or hold the requisite authority; and so forth. Knowledge of all these background conditions is undeniably a posteriori. However, I do not think that knowledge of these preparatory conditions constitutes part of the justification of the propositional content resulting from a declarative act. The justification lies solely in the fact that it was so declared. In the book, I draw a parallel between this position and the epistemologies of Kant and BonJour, according to which some form of empirical experience may be required merely to understand a proposition such as that expressed by '2 + 2 = 4' or by 'all red apples are red'; but once the proposition is understood, no *further* relevant experience is needed for its justification. In the same spirit, I argued that if knowledge of the preparatory conditions of a successful illocutionary act must count toward its justification, then no a priori knowledge could ever be obtained through mathematical definitions, for they too have felicity conditions: for instance, that no prior definition of the same term or notion exists within the same formal system; that the definition appeals only to primitive or previously defined terms; and that it is consistent with definitions previously established within the same theory.[10]

At this point comes the second step of Eduardo's argument, aimed at undermining my analogy between Kripke's stipulations and mathematical definitions. He argues that even if knowledge of the felicity conditions is empirical in both Kripke's cases and in mathematical definitions, there is a significant divergence after the stipulation or definition has been made. According to Eduardo, the analogy between knowledge of institutional facts and knowledge of mathematical definitions breaks down because:

(i) Enduring knowledge of an institutional fact depends on its persistence over time, which in turn relies on the collective intentionality of a social group;

whereas

(ii) Once a mathematical definition is successfully introduced, its truth is self-sustaining—grounded in its mathematical content—and independent of further institutional recognition or collective intentionality.

Eduardo's point is both interesting and important—not so much because it exposes a limitation in the stipulation of institutional facts

[10] For a discussion of the success conditions of definitions, see Ruffino 2021 and Gupta 2021.

(as in Kripke's cases, on my account), but because it invites a deeper examination of the other side of the analogy: namely, the illocutionary structure and content of mathematical definitions. The result is, I believe, somewhat surprising, as it reveals that—despite their aura of necessity and language-independence—mathematical definitions are in fact closer to ordinary stipulations than many philosophers of mathematics are prepared to acknowledge.

Eduardo's claim that the parallel breaks down rests on the relatively common assumption that the content of a mathematical definition is itself a mathematical proposition. But this assumption must be mistaken for a straightforward reason: if the content of the definition were already a mathematical proposition, it would be true independently of the definition itself and, therefore, could not be made true by the act of definition—which is precisely the illocutionary point of a declarative act.[11] To better understand the structure and function of mathematical definitions, we must distinguish between two categories: (1) purely abbreviative definitions and (2) contentual definitions—those that not only abbreviate but also introduce a theoretical perspective through which a given entity is conceptualized. A definition of the first kind is merely a proposal to replace a longer or more cumbersome expression with a shorter or more convenient one; its aim is purely practical. E.g.,

- A set x is *transitive* $\equiv_{def} \forall y(y \in x \rightarrow y \subseteq x))$

Here 'transitive' merely abbreviates the longer expression for a property of some sets. Abbreviations, as such, have only a metalinguistic content. But metalinguistic contents are clear cases of institutional facts that depend on (individual or collective) acceptance. A mathematician might decide to change the *definiendum* or the *definiens* of a mathematical abbreviation, and this is not restricted by any mathematical law but, again, only by practicity. Incidentally, Eduardo's example of definition, i.e.,

- Let D be the set of all continuous functions on $\mathbb{R}$

is of this kind: the content is only metalinguistic and, as such, an institutional fact. A definition of the second kind has a different purpose: it is meant to capture the defined entity from a certain epistemic perspective. For example,

- A set x is infinite $\equiv_{def}$ there is a bijection between x and a proper subset of x

[11] This point is better developed in Ruffino 2025.

or Frege's definion of cardinal number

- The number of $F \equiv_{def}$ the extension of the second-order concept φ *is equinumerous with* F

These definitions are not meant just as abbreviations, but as also placing the entity under study (infinite sets or cardinal numbers) under a specific epistemic perspective which, according to the authors (Cantor or Frege), is theoretically promising or fuitful. But, again, the content is not initially a mathematical content since, if it were so, it would not be the subject of a definition, but of a theorem. It becomes a mathematical content under the acceptance of the epistemic perspective offered by the theory. But the epistemic perspective is a matter of choice and (individual or collective) acceptance, as much as other institutions (although the criteria of their acceptance might be different than, for instance, the acceptance of some civil institution such as marriage). In this second kind of definitions, there are actually two sorts of institutional facts being established: the metalinguistic one, i.e., an abbreviation, but also an epistemic one, i.e., the stipulation of a privileged epistemic perspective, among perhaps other possible perspectives (e.g., other possible definitions of infinite sets and cardinal numbers).

For these reasons, I do not believe that the analogy between stipulations and mathematical definitions breaks down as readily as Eduardo suggests. This claim may seem counterintuitive, particularly to those who favor a realist interpretation of fields such as mathematics and logic. However, as I argue in Chapter 11, Frege stands as a notable example of a realist philosopher who, at the same time, acknowledged that certain elements within logic and mathematics—such as definitions and the selection of a conceptual framework—are, at least in part, matters of decision and stipulation.[12] That said, such decisions and stipulations must demonstrate their fruitfulness in order to deserve acceptance.

6. *Reply to Mario Gómez-Torrente*

Mario Gómez-Torrente disagrees with my strategy of accounting for contingent a priori knowledge in Kripke's cases as the result of successful declarative acts that create institutional facts. He challenges the claim that a successful stipulation in the meter case generates an

[12] He even introduced a special symbol for definitions in §24 of *Begriffsschrift*, which we might now characterize as an illocutionary force indicator for something essentially different from the force of assertions.

DOI:https://doi.org/10.22201/iifs.18704905e.2025.1709 *Crítica*, vol. 57, no. 170 (agosto 2025)

institutional fact. In this respect, he aligns with the more traditional accounts in the literature—those I reviewed and sought to circumvent in my book.

The core of Mario's objection, as I understand it, is this: he focuses on the Neptune case and maintains that the content of (**N**) is an astronomical fact. But astronomical facts, he notices, are not the kind of thing that can be brought into existence by linguistic acts. Hence, in the Neptune case, no institutional fact is created and, consequently, there is no basis for a priori knowledge. He then extends this conclusion to the meter case, asserting that it is not 'relevantly different'.

Let me begin by pointing out that Mario's argument does not appear to give due consideration to a distinction I draw in Chapter 10 of the book, namely, between two possible propositional contents underlying the stipulation behind (**N**), which correspond to two distinct speech acts performed by Le Verrier in his stipulation (which I labeled (**N***) and (**N****)):

(N*) I stipulate (define, declare, etc.) that ['Neptune' refers to the planet causing the perturbations in Uranus's orbit].

(N)** I stipulate (define, declare, etc.) that [Neptune is the planet causing the perturbations in Uranus's orbit].[13]

The content of (**N***) is metalinguistic, whereas the content of (**N****) expresses an astronomical fact. In Chapter 10, I ask which of these acts Le Verrier can plausibly be said to have performed. Some critics of Kripke—such as Donnellan—argue that all Le Verrier could achieve through his stipulation is contingent a priori knowledge associated with the propositional content of (**N***); that is, merely metalinguistic knowledge. But this result is considerably less philosophically significant than what Kripke appears to have had in mind—namely, contingent a priori knowledge conveyed by (**N****).[14] Hence, Mario's broader claim that 'no actual human being could create the fact described by (**N**) in any way' is inaccurate insofar as it overlooks (**N***)

[13] For the sake of simplicity, I omit the existential clause from the propositional content.

[14] Donnellan, in fact, claims that the most Le Verrier could know through stipulation alone is that a certain sentence—'Neptune is the planet causing the perturbations in Uranus's orbit'—is true. This knowledge is indeed contingent and can be known a priori in virtue of the stipulation. However, Le Verrier could not know which truth the sentence expresses without some kind of epistemic acquaintance with Neptune, thereby undermining the a priori status of the case.

with its propositional content as the stipulation. This content could, and indeed was, brought into being by Le Verrier's declaration, and it can be known a priori (although it, admittedly, does not constitute the kind of fact Kripke likely had in mind). What cannot be created by linguistic means is the propositional content of (**N****), which describes a brute astronomical fact.[15]

Mario contends that the 'natural view' is to regard the meter case as not relevantly different from the Neptune case. However, a central aim of Chapter 10 is precisely to show that this is not (or should not be) the 'natural view'. Despite the fact that these cases are frequently discussed together in the literature, they are rarely analyzed with sufficient attention to the subtle but crucial differences between them. There are certain things that can be brought about by language alone—provided the felicity conditions of the speech act are satisfied–and others that cannot. When Kripke's cases are examined through the lens of illocutionary force, it becomes clear that the differences between them are far from negligible. To draw an analogy: a priest can change a couple's marital status through a declarative act, but no priest can alter the biological origin of the couple by such means. In the Neptune case, I argue that by performing (**N***), Le Verrier became illocutionarily committed to (**N****). Yet while (**N***) can succeed as a stipulative act, (**N****) cannot. By contrast, this is not the case with the meter stipulation (or with the introduction of other units of measurement). In the meter case, it is indeed possible to successfully perform both acts: one that introduces a linguistic norm and another that institutes a new scientific standard:

(M*) I stipulate (define, declare, etc.) that ['One Meter' refers to the length of S at t_0].

(M**) I stipulate (define, declare, etc.) that [One meter is the length of S at t_0].[16]

[15] As Searle notes in this regard:

> It is just a fact about how the world works, and not part of the semantics of English verbs, that we humans are unable to perform these acts by declaration. But there is nothing in the semantics of such verbs that prevents us from intending them performatively; it is just a fact of nature that it won't work. (1985, p. 554)

[16] In Chapter 10 I draw an analogy between Kripke's meter case and the new definition of kilogram by the 26th General Conference of Weights and Measures, that took place in Versailles in 2018: by the new definition, the General Conference

The second illocutionary act does not have metalinguistic content. However, as I have already emphasized in my reply to Emiliano, it should not be interpreted (as Mario perhaps does) as an attempt to fix a physical property of the stick—this cannot be achieved by linguistic means. Rather, it should be understood as asserting that the stick exemplifies one unit of the newly introduced standard of length.

Mario reiterates his argument with minor variations, maintaining that there are no relevant differences between (**M**) and things like

(**A**) Aristotle is my son born yesterday [said by Aristotle's father]

(**H**) Hesperus is the heavenly body in yonder position in the sky [said by Kripke's 'mythical agent'].

In the same way that the facts related in (**A**) and (**H**) are not made true by the stipulation, (**M**) is not made true by the linguistic act.[17]

As previously noted, there are significant differences between these cases, despite Mario's assertion that there is no semantic distinction among expressions such as 'one meter', 'Neptune', 'Aristotle', and 'Hesperus'. This marks a deep point of disagreement between us: although these expressions are semantically similar in that they are rigid designators introduced via non-rigid definite descriptions, the nature of the facts described in (**M**) differs markedly from those described in (**N**), (**A**), and (**H**). It should now be clear that I fundamentally disagree with Mario's claim that the role of (**M**) (understood here as (M^{**})) as foundational within the practice of measurement is 'irrelevant to the intuitive content and to the nature of the fact described by (**M**)'.

Mario introduces an additional consideration, seemingly intended as a *reductio* of the view that the fact introduced by (**M**) is an institutional fact. He imagines a scenario in which someone entirely forgets that a unit of measurement called 'meter' has already been defined as the length of standard stick *S*, and independently decides

of Weights and Measures not just introduced a new word in the scientific vocabulary (a metalinguistic fact), but also an institutional fact that had a significant impact in science.

[17] As previously discussed, (**M**) is ambiguous between ($\mathbf{M}^{*}$) and ($\mathbf{M}^{**}$); a similar ambiguity applies to (**N**), (**A**), and (**H**). That is, each may be interpreted either as expressing a purely metalinguistic content—($\mathbf{N}^{*}$), ($\mathbf{A}^{*}$), and ($\mathbf{H}^{*}$)—or as expressing a non-metalinguistic content—($\mathbf{N}^{**}$), ($\mathbf{A}^{**}$), and ($\mathbf{H}^{**}$). Since metalinguistic contents are clearly amenable to stipulation, I take it that Mario is referring to the non-metalinguistic readings ($\mathbf{N}^{**}$), ($\mathbf{A}^{**}$) and ($\mathbf{H}^{**}$).

to introduce a unit of length using the same stick in the following manner:

(**R**) One retem is the length of stick S at t_0.

Mario claims that the institutional fact created by this new stipulation must be numerically distinct from the fact introduced by the original stipulation and, therefore, that (**M**) and (**R**) express different contents. However, I see no compelling reason to assume that the two facts must be numerically distinct. The mere use of different names for the length of the same stick does not entail the creation of distinct facts—just as using 'meter' (in American English) or 'metre' (in British English) does not result in different standards.[18]

Mario also attempts to undermine the analogy between stipulations in Kripke's cases and mathematical definitions by employing essentially the same strategy I addressed in my reply to Eduardo—namely, by claiming that the content of a mathematical definition is true in virtue of mathematical reality, rather than as a consequence of any act performed by the mathematician. My response here is, accordingly, the same. Incidentally, the example of a definition provided by Mario is also of the merely abbreviative kind ('let ω be the set of all finite ordinals'), rather than one that introduces an epistemic perspective on the relevant notion. Such a definition, insofar as it just introduces an abbreviation, merely establishes a metalinguistic fact; it does not, by any means, bring about a fact that obtains independently of any act of the mathematician. Even under a strict Platonist interpretation of mathematics, there is nothing in the Platonic mathematical realm that determines the label 'ω' for the set of all finite ordinals. This designation is a convention introduced by the mathematician.

Mario's final critical remarks are not so much directed at my account as they are at Kripke's reformulation of his position in his later lectures. Mario interprets Kripke as willing to concede that (**M**) is not known a priori, but a posteriori. However, this clearly misrepresents Kripke's declared aim in those lectures, as I explain in detail in Chapter 5. What Kripke does is some concession to the acquaintance

[18] Additional considerations also weaken the force of Mario's counterexample. For instance, if the original stipulator is a recognized metrological authority and the second is not, then (**R**) would fail to meet the felicity conditions for a successful declarative act and, thus, would not generate a new institutional fact alongside (**M**). Conversely, if both stipulators possess equal institutional authority, then there is little reason not to regard the facts introduced by (**M**) and (**R**) as essentially the same, differing only in inessential respects—much like two mathematicians introducing the same definition under different labels.

DOI:https://doi.org/10.22201/iifs.18704905e.2025.1709 *Crítica*, vol. 57, no. 170 (agosto 2025)

or perceptual requirements for successful stipulations, but that do not, in his view, undermine the a priori nature of his cases. In the book, I report Kripke's reply to Salmon's complaint that the length of the meter stick can only be known a posteriori: Kripke argues that, on the contrary, if the length of the stick cannot be known a priori, then it cannot be known a posteriori either—and, indeed, neither can the length of anything else. Mario thinks that Kripke offers little support for this assertion, and that my endorsement of it is similarly underdeveloped. Contrary to his view, I believe Kripke's point is quite clear, and sections 5.4 and 10.3 of the book are intended to explain and justify it: the knowledge of any length (and scientific measurement more broadly) presupposes the existence of a standard. Yet standards of measurement do not exist in nature as brute facts; rather, they must be fixed by stipulative, declarative acts similar to (**M**) (or (**M***) or (**M****)). As a result of such an act, there is something that can be known a priori—namely, the length of the standard stick, in the relevant sense that no empirical measurement is required.

Again, as I said in my reply to Emiliano, there is a subtle but crucial difference between a physical body—such as the standard stick—having a physical property (a certain length) and our ability to *report* that property in doing science. The first is a brute fact; but the latter requires an institutional fact, which is not itself reducible to a brute fact. As Searle aptly puts it,

> Thus the statement that the sun is ninety-three million miles from the earth requires an institution of language and an institution of measuring distances in miles, but the fact stated, the fact that there is a certain distance between the earth and the sun, exists independently of any institutions. (1995, p. 27)

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Received: July 2, 2025; accepted: July 5, 2025.