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MEASURES WITHOUT MEASUREMENT: A CRITIQUE OF RUFFINO'S INSTITUTIONAL APPROACH TO THE CONTINGENT *A PRIORI*

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SUMMARY: This paper presents three objections to Marco Ruffino's account of contingent *a priori* truths. First, I argue that Ruffino's "Philonous' Objection" neglects what is widely considered the mark of perception—namely, perceptual constancies, which allow stable representations despite variable sensory input. Second, I show that Ruffino's institutional approach to the contingent *a priori* faces challenges under both relational (ratio-based) and monadic (property-ascribing) interpretations of measurement statements: the former diminishes the need for stipulation, while the latter risks conflating stipulative acts with empirical measurement outcomes. Third, I contend that Ruffino's account risks an unwarranted commitment to social constructivism about brute physical facts.

KEYWORDS: perceptual acquaintance, institutional facts, measurement standards, perceptual constancies, speech acts

RESUMEN: Este artículo presenta tres objeciones a la teoría de las verdades contingentes *a priori* de Marco Ruffino. En primer lugar, argumento que la "objeción de Filonús" que plantea Ruffino ignora lo que se considera ampliamente el rasgo distintivo de la percepción: las constancias perceptivas, las cuales permiten formar representaciones estables pese a las variaciones en la información sensorial. En segundo lugar, muestro que la concepción institucional de Ruffino de lo contingente *a priori* se enfrenta a desafíos según las interpretaciones relacionales (basadas en proporciones) como las monádicas (que atribuyen propiedades) de los enunciados de medición: la primera pone en tela de juicio la necesidad de estipulación, mientras que la segunda corre el riesgo de confundir los actos estipulativos con los resultados de la medición empírica. En tercer lugar, sostengo que la explicación de Ruffino corre el riesgo de comprometerse, sin justificación alguna, con un constructivismo social de los hechos físicos brutos.

PALABRAS CLAVE: percepción, hechos institucionales, estándares de medición, constancias perceptivas, actos de habla

1. *The Experience Condition and the Philonous' Objection*

Kripke's claim—that acts of stipulation can suffice for acquiring a priori knowledge of contingent truths—has been met with skepti-

cism from philosophers such as Alvin Plantinga, Keith Donnellan, and Nathan Salmon. These critics argue that some form of perceptual acquaintance or empirical engagement with the referent is indispensable for genuine knowledge of such truths. Their objections are grounded in the intuition that knowledge of the physical world cannot be divorced from experiential contact.

Ruffino responds to these challenges by defending the Kripkean contention against the acquaintance and experience conditions. His central aim is to demonstrate that perceptual contact with an object is neither necessary nor sufficient for a stipulator to possess *a priori* knowledge of the object's properties. To this end, he introduces the "Philonous' Objection", inspired by George Berkeley's critique of the reliability of sensory perception. This objection highlights the inherent variability of sensory perception, arguing that visual contact with an object is neither necessary nor sufficient for understanding properties like length. Ruffino asserts, "there are many different impressions that one might get from seeing *S* depending on the perspective, on the angle, on how far from the eye *S* is, etc" (p. 52), emphasizing that perceptual impressions can be misleading. He concludes that, "just seeing *S* does not give the stipulator a good (or unique) idea of what the length of one meter should be like" (p. 52).

However, this interpretation overlooks a distinction, rooted in a Kantian insight, and well-recognized in the scientific literature on perceptual psychology, between mere sensation and genuine perception.¹ Research in the psychology of perception has consistently demonstrated that the hallmark of perception, as distinct from mere sensation, lies in the ability to distinguish between a mere change in experience and an experience of change in the object perceived. In cases of mere sensation, any shift in sensory input corresponds directly to a change in what is experienced: a sensory state fluctuates with no further structure beyond the immediacy of its occurrence. But in cases of perception proper, a fundamental distinction emerges between subjective variations in experience and objective alterations in the perceived world. This distinction is achieved primarily through perceptual constancies, which allow us to track external objects and their properties despite changes in the conditions under which they are observed.

Size consciousness involves how the visual system and associated cognitive processes yield stable experiences of objects as having con-

¹ Kant 2003 (1781/1787), *Critique of Pure Reason*, A 177/B 219, A 182/B 225, and at A 189–99/B 234–44. See also Dicker 2011.

stant sizes despite variations in retinal image size caused by differences in viewing distance or perspective. The perceptual processing of a content as to the size of an object initiates a sequence in which changes in proximal stimuli are encoded for subsequent processing (registration). However, during the actual apprehension of this content—the subjective experiential awareness itself which is relevant for the acquisition of perceptual knowledge—one becomes conscious of two distinct classes of properties: object properties of the focal stimulus, which typically remain stable, and “situation properties”, reflecting more variable environmental conditions, such as the observer’s position relative to the focal object or the object’s angular size.

Ruffino’s invocation of the Philonous’ Objection, I think, hinges on a potential ambiguity. He writes:

Suppose that one sees *S* from a certain distance, but is under a wrong impression as to how far away *S* is, so that what appears visually to be of a certain length might actually be much larger (as when, e.g., we see a very tall building from a distance and it looks quite small). Similarly, if *S* is placed very close to the eye it might seem very large. (p. 52)

This passage oscillates between two different readings. On one reading, Ruffino is describing a case of illusion—one in which the subject misperceives the object’s size due to a mistaken judgment about its distance. On another reading, however, he is merely noting the familiar fact that an object’s retinal projection varies with viewing conditions, without implying that the subject is actually deceived about the object’s size. The ambiguity is reinforced by Ruffino’s later claim that “the abstract length with which one establishes a cognitive relation *changes* according to the perspective under which one sees *S*” (p. 59; my emphasis). What changes, however, is merely the proximal stimulus—the retinal image—not the perceived size of the object. Given that perceptual constancies systematically allow subjects to perceive an object as maintaining its actual size despite perspectival changes, Ruffino’s passage conflates variation in sensory input with variation in perceived properties.

Salmon concedes that merely perceiving an object may not always result in such empirical knowledge, for example under circumstances that create optical illusions (1987, p. 205). Ruffino, however, finds this response unsatisfactory, arguing that it fails to fully appreciate the force of the Philonous’ Objection:

But Salmon does not take the threat seriously enough. The passage says “under the required circumstances”, but there is no specification of what would be required except excluding perspectives that would clearly give the wrong impression (such as viewing *S* laterally, perceiving only its thickness). But seeing *S* “lengthwise, from end to end, in one fell swoop”, as Berkeley says through Philonous’ Objection, might still give many different impressions of length depending on one’s distance from *S*. As we saw in the discussion of Plantinga’s objection, no sensory experience of *S* will be enough to enter into the appropriate cognitive relation to its length. (p. 59)

Ruffino’s dissatisfaction rests on the claim that merely avoiding optical illusions is insufficient—perspective shifts, even under normal conditions, allegedly generate multiple, varying impressions of length. But this assumes that such perspectival variation translates into epistemic instability, a claim that is at odds with the well-established findings in perceptual psychology mentioned above: perceptual constancies enable subjects to reliably perceive stable properties despite significant variation in sensory input (Ruffino’s “different impressions”). In the case of size constancy, mechanisms such as binocular convergence, motion parallax, and contextual depth cues allow perceivers to correctly judge an object’s size even as its retinal projection changes.² It is precisely these mechanisms that prevent ordinary perception from being vulnerable to the kind of perspectival instability Ruffino alleges. As Tyler Burge wrote in his seminal *Origins of Objectivity*, “I think that, suitably characterized, perceptual constancies are necessary as well as sufficient for perception, and hence for perceptual objectivity” (2010, p. 413). This observation is grounded in an extensive body of scientific research on perception, which demonstrates that perceptual constancies provide a robust and stable framework for acquiring knowledge of an object’s length, countering Ruffino’s claim that sensory experience is inherently insufficient.

2. *The Locutionary Content of Measurement Statements*

Ruffino argues that stipulative acts are performatives—linguistic actions that bring about certain facts simply by being performed successfully. According to him, such stipulations do not merely describe pre-existing states of affairs; rather, they create new institutional

² For further discussions on the role of constancies in countering the Philonous’ Objection, see Burge 2021, 2010, 2007; Peacocke 2008, Ross and Plug 1998, and Dicker 2011.

facts. This performative dimension is central to his explanation of how contingent *a priori* knowledge is possible.

His key claim is that the truth of certain contingent *a priori* propositions is constituted by the very success of the stipulative act itself. For example, when a stipulator defines “one meter” as the length of a particular stick *S* at time t_0 , this act does not merely refer to an independently existing property, but actively fixes the referent of “one meter”. Hence, the proposition “Stick *S* is one meter long at t_0 ” becomes knowable *a priori* because its truth is grounded in the success of the stipulation, not in empirical observation.

While the establishment of a certain length as the standard of measurement is surely an institutional and social affair, the *prima facie* counterintuitive consequence of Ruffino’s view is that it seems to make the truth-makers of measurement statements socially constructed when they appear to be brute physical facts. Ruffino is well aware of this tension. Indeed, he acknowledges that “it is a brute fact that the meter stick has a certain length” (p. 173). He further asserts that this brute fact serves as the basis for the institutional fact that the stick is one meter long, an institutional status conferred through declarative acts. Ruffino maintains that the propositional content of the meter sentence, “Stick *S* is one meter long at t_0 ”, is made true not by the brute natural fact of the stick’s length, but by the institutional fact generated through stipulation.

In order to assess Ruffino’s account of the truth-maker for the meter sentence, it is crucial to examine the broader question of what measurement statements express. Measurement claims, after all, purport to convey objective information about the world. Yet their epistemic status is unusual: they involve conventional standards while also aiming at empirical accuracy. Before evaluating Ruffino’s proposal, we must clarify the nature of measurement statements more generally: what proposition is expressed when we assert that an object has a certain length, and how do such propositions relate to the physical reality they describe? When we assert, for example, “Mount Everest is 8,848.86 meters high”, what precisely are we claiming about the world?

This question reveals an ambiguity at the heart of measurement discourse, which can be elucidated by distinguishing between two alternative interpretations.³ Under a *relational* reading, measurement statements articulate ratios between physical magnitudes. In contrast,

³ For a discussion of the historical and foundational issue related to these understandings of measurement, see Michell 2005, 1995, 1994, 1993.

the *monadic* reading treats these statements as ascribing specific, determinate properties to objects. The epistemological and metaphysical implications of these interpretations diverge significantly, especially concerning the *a priori* status of measurement propositions and the necessity (or lack thereof) of empirical acquaintance.

Consider again the standard measurement statement: “Mount Everest is 8,848.86 meters high.” On the relational interpretation, this proposition asserts a specific ratio between two magnitudes: the height of Mount Everest and the length of the meter stick, which serves as the standard unit of measurement. Here, the proposition is relational: it expresses that the ratio between Everest’s height and the meter stick is 8,848.86:1. Conversely, the monadic interpretation treats measurement statements as ascribing specific magnitudes—intrinsic, determinate properties—to objects within a representational framework. Under this interpretation, “Mount Everest is 8,848.86 meters high” attributes a determinate property to Everest, represented by the numerical value 8,848.86.

The construction of such numerical scales relies fundamentally on underlying relational facts, particularly ratios between physical magnitudes. These ratios provide the foundational structure upon which numerical assignments are built. The process of constructing a measurement scale involves establishing a homomorphism—a structure-preserving mapping—between the set of empirical objects and a numerical system, such as the real numbers. This homomorphism ensures that the ordering and ratio relationships among physical magnitudes are mirrored within the numerical scale.

An application of the ambiguity between relational and monadic readings to the meter sentence allows us to cast light on the tension that emerges in the literature between the need for experience and the apparent *a priori* status of the meter sentence. The statement “*The meter stick S measures 1 meter at time t_0* ” can be interpreted in two ways, too. Relationally, it asserts that the ratio between S ’s length and itself is 1:1—a conceptual necessity that holds *a priori*, contingent only on S ’s existence. This proposition is trivially true and requires no empirical confirmation because it follows directly from the reflexivity of equality. However, under the monadic reading, the same sentence attributes a determinate property to S —namely, its length at t_0 —which could have been different. In this interpretation, “1 meter” functions not merely as a relational placeholder, but as an intrinsic descriptor of a contingent physical property.

This distinction sheds light on the shifting intuitions that have characterized debates over the *a priori* status of the meter sentence.

When philosophers claim that the meter sentence is knowable *a priori*, they often implicitly adopt the relational reading. Once the reference of “one meter” is fixed by stipulation, the statement that *S* is one meter long expresses a trivial ratio between *S*’s length and itself. The truth of this proposition requires no empirical confirmation because it follows immediately from the way the standard is introduced. As Salmon observes: “If the reference-fixer can know of *S*’s length, Leonard, just by looking, that *S* is presently exactly that long, then in some sense he cannot fail to know that *S*’s length is exactly one times that length—except by not seeing it under appropriately favorable circumstances” (Salmon 1987, p. 207).

However, when philosophers discuss the contingency of the meter sentence, the monadic reading comes into play. Here, the proposition states that *S* has a particular magnitude, which could have been different. Since *S*’s length is a contingent fact about the world, the truth of the sentence is contingent as well. This characterization aligns with the monadic reading, where the term “meter” designates a specific length, and the sentence “The length of *S* is one meter” ascribes a monadic property to *S*. Under this reading, the proposition expressed states that *S* instantiates the precise magnitude named “meter”.

Ruffino further considers Salmon’s observations inspired by Wittgenstein as introducing a third view, one that aims to dissolve a paradox concerning the epistemic status of measurement sentences by appealing to linguistic practices surrounding measurement. The paradox arises from an apparent tension in our knowledge of standard measurements: on the one hand, the stipulative definition of the meter (as the length of stick *S* at time t_0) seems to make “Stick *S* is one meter long at t_0 ” knowable *a priori*; on the other hand, knowledge of any object’s length is typically thought to require empirical verification. This generates a conflict: is our knowledge of the Standard Meter’s length purely stipulative and *a priori*, or does it depend on empirical facts? The supposed therapeutic approach derived from Wittgenstein reflects an attempt to alleviate this tension by examining the way measurement terms function in linguistic practice. While Ruffino criticizes Salmon’s proposal for failing to fully resolve the paradox, I argue that the deeper issue is not fluctuating epistemic standards, as Salmon suggests, but rather an unnoticed shift between relational and monadic readings of measurement statements.

Salmon’s proposed “Wittgensteinian” therapy at the end of his paper revolves around the idea that the paradox concerning the Standard Meter arises from a shift in our interests and the context in

which we use the phrase “knowing how long”. He suggests that the concept of “knowing how long” is interest-relative, much like “knowing who”, where the criteria for knowledge depend on the context and the specific interests involved. According to Salmon, the paradox emerges when we move between two contexts: in ordinary discourse, knowing a length’s standard name in the metric system is sufficient to say we “know how long” something is, whereas in a more demanding philosophical context, we require a deeper grasp of the standard itself. This contextual shift, he argues, creates the illusion of a paradox rather than an actual epistemic conflict.

Thus, Salmon’s “Wittgensteinian” therapy involves recognizing that the sentence “The Standard Meter is exactly one meter long” becomes problematic when it invites the kind of skeptical questioning that is inappropriate for the everyday context where the sentence is usually unproblematic. It’s “better to say nothing”, or to at least be aware of how uttering the statement can shift our perspective to one in which it is unjustifiable.

To be sure, Salmon is right in noting that there exists a context-dependent standard of precision in measurement practices, where one may be said to know a certain measurement statement relative to one such standard, but not another. However, I argue, such contextual shifts in standards of precision are irrelevant to the phenomenon under scrutiny here. The paradox concerning the meter sentence is not about varying levels of measurement precision, but about the more fundamental issue of which proposition is being expressed and thus evaluated for truth and epistemic status.

3. *The Institutional Account of Measurement Statements and the Threat of Social Constructivism*

Drawing on speech act theory, particularly the works of J.L. Austin and John Searle, Ruffino argues that the truth of certain contingent *a priori* propositions is constituted by the very success of the stipulative act itself. For example, when a stipulator defines “one meter” as the length of a particular stick *S* at time t_0 , this act does not merely refer to an independently existing property but actively fixes the referent of “one meter”. Hence, the proposition “Stick *S* is one meter long at t_0 ” becomes knowable *a priori* because its truth is grounded in the success of the stipulation, not in empirical observation.

While the establishment of a certain length as the standard of measurement is surely an institutional and social affair, the *prima facie* counterintuitive consequence of Ruffino’s view is that it seems

to make the truth-makers of measurement statements socially constructed when they appear to be brute physical facts. Ruffino is aware of this. Indeed, he acknowledges that “it is a brute fact that the meter stick has a certain length” (p. 173). He further asserts that this brute fact serves as the basis for the institutional fact that the stick is one meter long, an institutional status conferred through declarative acts. Ruffino maintains that the propositional content of the meter sentence, “Stick S is one meter long at t_0 ”, is made true not by the brute natural fact of the stick’s length, but by the institutional fact generated through stipulation.

This claim faces difficulties, particularly when viewed through the lens of the ambiguity discussed in the previous section. As we have seen, under the relational interpretation, the truth of the meter sentence fundamentally expresses a relation between the length of the meter stick and the unit of measurement—in this case, a ratio of 1:1. The critical point is that this ratio holds irrespective of any institutional stipulation. The brute fact of the meter stick’s length establishes that it would maintain the same ratio to itself whether or not it was designated as the standard of measurement. Thus, the stipulative act does not create the truth of the proposition; it merely provides a linguistic framework to articulate a fact that exists independently.

On the other hand, under the monadic interpretation, the proposition “Stick S is one meter long” predicates an intrinsic property—its length—to the stick. This property exists independently of linguistic practices or institutional stipulations. As Ruffino himself concedes, “the meter stick has the same length before and after a stipulation is made” (p. 174). This acknowledgment undercuts his subsequent claim that the institutional fact generated by the stipulation serves as the truth-maker of the meter sentence.

Under a monadic reading, in fact, the choice of a certain length as a standard influences only the selection of a particular representation within the interval scale, not the represented physical facts themselves. This is analogous to the conventional role of selecting an origin and the use of coordinates to describe spatiotemporal facts, events, or locations. While the choice of coordinate system involves conventions, the underlying spatial or temporal facts do not.

Regardless of how we interpret the meter sentence, by substituting “1 meter” for “the same length” in Ruffino’s claim (p. 174) that:

[Brute fact 1] “*the meter stick has the same length before and after a stipulation is made*”, (p. 187)

we derive the truth of:

[Brute fact 2] “*the meter stick is 1 meter long both before and after the performative act*”.

Ruffino grants that “[W]e have determined the reference of the phrase “one meter” by stipulating that “one meter” is to be a rigid designator of the length which is in fact the length of *S* at t_0 ” (Kripke 1972/1980, pp. 54–56). This stipulation fixes “one meter” as referring to that natural, pre-existing length, ensuring that any sentence attributing to *S* the property of being “1 meter long” should be truth-apt (and true) solely on the basis of this brute fact. However, Ruffino further claims, coherently with his account, that:

[Institutional fact] “[*The sentence ‘Stick S is one meter long at t_0 ’], conceived [...] in abstraction from any illocutionary act, cannot be true (and, depending on how we understand the proposition expressed, maybe cannot be false either)*”. (p. 117)

This implies that, absent the performative act, the sentence Brute fact 2, and hence Ruffino’s plausible commitment to Brute fact 1, can equally not hold true. The contradiction is now evident: if “one meter” rigidly designates the meter stick’s natural length, then either Institutional fact or Brute fact 1 must go.

While this paper raises critical objections to Ruffino’s performative account of contingent *a priori* truths, it is important to clarify that these objections are not meant to undermine the intuition that the status of the meter stick as a standard of measurement is an institutional fact produced by a declarative act. In fact, I believe this intuition is correct, and Ruffino’s approach promises to clarify several issues related to the status of the meter as a standard. However, if this account implies that the stipulative act brings into existence the truth-maker for the meter sentence, then the same arguments Ruffino uses against the possibility of declaratively establishing the truth of the Neptune sentence apply here as well. This is why.

Ruffino states “(N) [‘I stipulate that Neptune is the planet causing the perturbations in Uranus’ orbits’] fails to achieve the point (which would be to make true that Neptune is the planet that causes the perturbations in Uranus’ orbits by means of the very utterance)” (p. 192) because “that Neptune is the planet that causes the perturbations in Uranus’ orbits is an astronomical fact that cannot be

stipulated (at least not by human beings)” (p. 192). *Mutatis mutandis*, if we consider $(\mathbf{M})^{**}$ —“I stipulate that one meter is the length of S at t_0 ”—when this is understood monadically as ascribing a particular physical property to a specified object, it too fails to achieve the point, since the length of S at t_0 is a brute physical fact that cannot be brought into existence by stipulation alone. Thus, the ontological resistance Ruffino identifies in the Neptune case equally challenges the meter case under this interpretation.

Moreover, even if we adopt a relational reading of the content of $(\mathbf{M})^{**}$, the declarative illocutionary act will still fail to achieve its intended effect. In this case, the content of the declaration would be to the effect that 1 is the ratio of the length of stick S at t_0 to the standard of measurement—that is, to itself. However, such a statement expresses a necessary truth, as the ratio of any magnitude to itself is necessarily one. Therefore, the declarative act cannot bring this fact into existence either, as its propositional content holds regardless of whether the act is performed. Thus, under both the monadic and relational readings, the declarative illocutionary act fails to constitute the fact it purports to establish.

The present objection does not rest on a commitment to realism about measurement outcomes. Rather, it highlights that a theory of the contingent *a priori* should not automatically entail an anti-realist or social constructivist stance. The core concern is that Ruffino’s account risks blurring this distinction by suggesting that stipulative acts have ontological consequences beyond their linguistic or institutional functions.

4. Conclusions

In examining Ruffino’s institutional account of measurement statements, this paper has identified two tensions in his framework. While his account offers valuable insights into the social nature of measurement standards, his reliance on the Philonous’ Objection underestimates the epistemic significance of perceptual constancies. More fundamentally, there is an unrecognized, systematic ambiguity between relational and monadic interpretations of measurement statements that helps explain why debates oscillate between asserting *a priori* status and recognizing the necessity of empirical acquaintance. While Ruffino’s institutional account illuminates the social and conventional aspects of measurement practices, it risks conflating the *act of measuring*—which undeniably involves social institutions

and conventions—with the *results of measurement* that measurement statements express, which aim to capture objective physical relations. A more nuanced approach must maintain this crucial distinction between our practices of measurement and the brute physical facts they represent.

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