I N T E R V I S T E

Conversation with Augustín Rayo

by Sebastiano Moruzzi and Andrea Sereni

Agustín Rayo is Professor of Philosophy at the Massachusetts Institute of Technology. His research focuses on the philosophy of logic and language. In his writings, Rayo has explored the representational nature of language, the relation between logic and mathematics, and the limits and nature of communicable thought. His recent book, The Construction of Logical Space *(Oxford University Press, 2013), contains a discussion of all these issues, and develops a novel framework inspired by some insights from Rudolf Carnap. We interviewed Rayo during a recent visit in Italy, and we asked him to tell us about his research projects and the central features of his philosophical views.*

1. *Dear Agustín, many thanks for accepting our invitation for this interview. You are particularly well-known among analytic philosophers for your extensive works on the philosophy of mathematics, logic, and language. In your recent book,* The Construction of Logical Space *(OUP, 2013), you offer some novel views on many of these issues. Your interests and views have evolved during your studies at M.I.T, as well as at the Arché center in St. Andrews. Before entering into philosophical details, many readers may be interested in learning how you got interested in these areas of philosophy during your studies and research.*

AR: I'm afraid my interests are mostly the result of indecision. When I was an undergraduate I was unsure whether I wanted to be a philosopher or a mathematician. I eventually ended up in a philosophy PhD program. But, unable to give up on my mathematical aspirations, I ended up focusing on logic and the philosophy of mathematics.

I finally gave up the dream of becoming a mathematician during a model theory class. Careful examination of the proof of Morley's Theorem convinced me that I wouldn't really be able to learn mathematics properly unless I devoted myself to the project full time. And by then I had fallen in love with philosophy.

In retrospect, I don't think I would have been a very good mathematician. So I have come to think that I owe a lot to Morley's Theorem. It's also a beautiful result: if a first-order theory in a countable language is categorical in some uncountable cardinality, then it is categorical in all uncountable cardinalities.

2. *In this connection, which philosophers and colleagues have most influenced your works and philosophical attitudes?*

AR: My graduate-school hero was, of course, my thesis advisor. Vann McGee has an amazing ability to prove a theorem, and write a paper showing that the theorem does real philosophical work. Those were exactly the sorts of papers I aspired to write myself.

Another big influence during my graduate student years was a reading group I organized with Øystein Linnebo and Marco Rescorla, who were then students at Harvard. We devoted the better part of three years to reading through the work of Michael Dummett, David Lewis, Bob Stalnaker and Charles Parsons. Those four figures have had an outsized influence on my thinking since.

Another important figure in my early philosophical development was Crispin Wright. I took up a position at St Andrews not because I thought my education was complete but because a multi-year postdoc in a research center devoted to the philosophy of mathematics seemed too good an opportunity to pass up. I have come to believe that cutting my PhD short was a good thing. The time I spent at St Andrews proved to be an excellent counterweight to some of the idiosyncrasies I picked up at MIT, and Wright was the central figure of this second stage of my philosophical education.

3. *One of your main research interests has been the philosophy of mathematics, and more specifically the neo-logicist project fostered by Bob Hale and Crispin Wright (cf. e.g. Hale, Wright [2001]). Neo-logicists aim at resuscitating (a version of) Frege's ill-fated logicist project by abandoning Frege's contradictory Basic Law V (which led to the well-known Russell's paradox) and appealing to the principle now known as Hume's Principle (HP) for a definition of the concept of cardinal number, HP being the (second-order) claim that for any concepts F and G, the number of F's is equal to the number of G's if and only if the F's and the G's are equinumerous (can be put into one-one correspondence). Neo-logicists roughly claim that HP is an adequate, possibly analytic, definition of cardinal number, and that it delivers an a priori access to at least*

the basic axioms of arithmetic. In "Logicism Reconsidered" [2005] *you have reviewed different versions of the logicist thesis, and you seemed sympathetic to some of them, but you have remained skeptical on the feasibility of the neo-logistic project. According to you – as you also discuss in* "Success by Default" [2003] *– neo-logicists need appeal to the thesis you call "success by default", but they have as yet not given a proper defence of it. Could you tell us what is the main role of this thesis in your opinion, and why the neo-logicist project would be jeopardized if the thesis is not properly supported?*

AR: This is a somewhat embarrassing question for me, because it forces me to admit that my views have changed very significantly since the days of "Success by Default".

On this I agree with my former self: I continue to believe that neo-Fregeans need some sort of reason for thinking that their introduction of HP will be successful. (On my preferred way of seeing things: they need some sort of reason for thinking that a stipulation to the effect that arithmetical vocabulary is to be used so that HP is true would be successful.)

My former self believed that such reasons could not be given, however, and with that I disagree. My change of heart came from the philosophy of language. Partly as a result of reading Wittgenstein's later work, I have come to accept a view about the nature of the relationship between our language and that world which I call "compositionalism". (In slogan form, compositionalism is the view that language only makes contact with the world at the level of sentences).

A feature of compositionalism is that it *entails* that a mathematical stipulation will be successful, provided that the statements involved in the stipulation are consistent. So I have come to believe that my worries in "Success by Default" were misplaced.

4. *In your recent book,* The Construction of Logical space*, you offer a novel view on mathematics, which goes under the name of "trivialism". Your starting point is with nominalistic paraphrases of arithmetical sentences. In order to avoid commitment to abstract objects like numbers, nominalists usually offer paraphrases of arithmetical sentences: these paraphrases are meant to deliver the real content of arithmetical sentences in such a way that it does not involve any commitment to numbers. You define a trivialist paraphrase function as one meeting a number of constraints, the most important of which seems to be that the truth conditions of a paraphrase of any sentence of pure arithmetic should be satisfied regardless of how the world turned out to be. The paraphrase strategy has well-known problems. In the end, however, you suggest an alternative way of offering trivialist contents for arithmetical sentences. Your strategy relies on the role of a special operator, the "just-is" operator. By way of example, you claim that for the numbers of dinosaurs to be zero just is for there to be no dinosaurs, and, more generally, for the numbers of F's to be n just is for there to be exactly n F's – where this latter claim can be given in purely logical terms by means of numerical quantifiers. The main gist of your strategy seems to be the following: that there is no difference at all between the number of F's to be n and there being n F's. In other words, there is no difference in how the world is required to be in order to satisfy both the truth conditions of a platonistic arithmetical sentence and those of the right hand-*

sides of just-is statements. You seem to suggest that the trivialist view both respects some nominalistic insights on the one hand, and allows for a commitment to mathematical objects on the other hand, this latter thing been also compatible with the vindication of some form of logicism. This idea has obvious bearing on traditional epistemological issues concerning our knowledge of mathematics conceived as knowledge of a domain of abstract objects. Could you tell us something more about the role of just-is statements, and how they are meant to solve the tensions in common nominalistic strategies and to lead us to support a novel version of logicism?

AR: I think of just-is statements as a way of liberating ourselves from our Quinean shackles.

As I read Quine, he thinks that the greater a sentence's ontological commitments, the greater the demands its truth imposes on the world. This means, in particular, that mathematical truths (which are typically committed to mathematical objects) place greater demands on the world that logical truths (which are usually taken to carry no ontological commitments).

This leads to an epistemological puzzle: how could one come to know that the greater demands of mathematical truths are, in fact, satisfied? In particular: how could one come to know that the world is endowed with the sorts of mathematical objects that would be required to satisfy the ontological commitments of mathematical truths?

Philosophers have put a lot of effort into addressing this puzzle. (I certainly gave it my best shot while I was in graduate school!) But I have since come to believe that the puzzle is based on a false presupposition: it is simply a mistake to follow Quine in

thinking that the greater a sentence's ontological commitments, the greater the demands its truth imposes on the world.

Just-is statements can be used to drive the point home. Here is a just-is statement that only a philosopher would dream of denying:

> For Socrates's death to take place *just is* for Socrates to die.

(or, equivalently: there is *no difference* between Socrates's death talking place and Socrates's dying).

Someone who accepts this just-is statement should think that even though there is a difference in ontological commitment between "Socrates death takes place" (which is committed to deaths) and "Socrates dies" (which is not), what is demanded of the world by the truth of these sentences is exactly the same. So she should reject the idea that it is harder to know that Socrates's death took place than it is to know that Socrates died.

Now consider an arithmetical just-is statement:

> For the number of Fs to be zero *just is* for there to be no Fs.

(or, equivalently: there is *no difference* between the number of Fs being zero and there being no Fs).

Someone who accepts this just-is statement should think that even though there is a difference in ontological commitment between "the number of the Fs is zero" (which is committed to numbers) and "there are no Fs" (which is not), what is demanded of the world by the truth of these sentences is exactly the same. So, much as before, she should reject the idea that it is harder to know that the number of Fs is zero than it is to know that there are no Fs.

5. *One recurring theme of your work is that we must be wary of doing bad philosophy of language, since not only it leads to a false account of language works, but it can also*

inspire bad philosophical theses in other domains of philosophy. In your book you argue for example that a bad picture of the philosophy of language is what underlines one of the motivations of the view that we can determinately quantify over absolutely everything - i.e the idea of absolute generality (a theme on which you co-edited a collection with Gabriel Uzquiano, cf. Rayo, Uzquiano [2006]). By opposing two theses, Tractarianism and Compositionalism, you argue that the claim that absolute generality is possible is grounded on misguided pictures of language and controversial theses in metaphysics. You define Tractarianism as the claim that "in order for an atomic sentence to be true, there needs to be a certain kind of correspondence between the semantic structure of the sentence and the 'metaphysical structure' of reality" (p. 4). Whereas you remain neutral, though skeptical, to the idea of a fundamental metaphysical structure of reality, you firmly oppose the idea that a sentence has a privileged and unique semantic structure (what Wittgenstein in the Tractatus *and* Russell in The Philosophy of Logical Atomism *called "the logical form") and that we use sentences to convey information about the metaphysical structure of reality. Your alternative view is Compositionalism, according to which the crucial role of an expression, such as a singular terms, is to contribute to a recursive specifications of the truth-conditions in the sentences in which it occurs. This thesis, clearly inspired by Frege's context principle, is meant to reject the picture of language based on the requirement of referentiality intended as thesis that a term can refer only "if it is paired with one of the objects carved out by the world's metaphysical structure" (p. 80). Could you tell us something more on why you believe Compositionalism to be a more adequate view than Tractarianism?*

AR: Having produced a fair amount of dubious philosophy of language myself, I probably shouldn't be issuing too many proclamations about the evils of doing bad philosophy of language. But I do think it's a good idea to keep one's linguistic theorizing relatively separate from one's metaphysics. One the one hand, I think one should try not to burden one's semantic theorizing with metaphysical assumptions; on the other, I think one should be careful about moving too quickly from natural language semantics to metaphysical claims.

The reason I think compositionalism is preferable to Tractarianism is embarrassingly simple. I take language to be a tool for communication, and I see no reason for thinking that a non-Tractarian language couldn't be used as an effective communicative tool.

6. *You claim that once the Tractarian picture is abandoned, we have no reason any more for accepting the thesis of absolute generality. In fact, the absolute generality thesis amounts to the claim that there is "a 'maxi domain' — a domain consisting of the entities that result from every possible way of carving up the world into objects" (p. 82). The abandonment of Tractarianism allows us to admit that there can be equally valid ways of describing a fact – i.e. saying that for there to be a table just is to say that there are some things arranged tablewise. These different specifications of the truth-conditions of sentences are just different ways of representing the world – instead of talking about tables, I can talk about things arranged tablewise. The thesis that we can quantify over everything then becomes the thesis that we can we quantify over all these possible systems of representation, and in order to claim that this is possible we need an*

antecedent answer to the question of what counts as a possible system of compositional representation. Could you tell us why you think that we cannot give a definite answer to this latter question?

AR: I think asking about all possible systems of representation is a bit like asking about all possible games. Our notion of a game just isn't constrained enough to allow for a definite answer to the question of what games there could be. And I think something similar is true of our notion of a system of representation.

In fact, a system of representation can be thought of as a game of a certain kind: a game in which speaker and hearer use a system of prompts to exchange information. But, as before, the relevant notion of a prompt just isn't constrained enough to allow for a definite answer to the question of what would count as a possible system of prompts.

7. *As we have seen, you suggest that just-is statements can be helpful in different contexts, mathematics and metaphysics above all (but also when applied to notions such as possibility and sameness of truth-conditions). In general, different just-is statements allow to discriminate between distinct ways in which the world could be, or, as you put it, between different conceptions of our logical space. If just-is statements have to play such a pivotal role, one should be equipped with a reasonable epistemology for them: in particular, one should be clear on what motivates acceptance of a particular just-is statement. It may be natural to see just-is statements in analogy with Carnap's meaning postulates: we stipulate, when devising a given linguistic framework, that some sentences are to be given the same truth-conditions as other sentences, cashed out in a*

more basic or less problematic vocabulary. Meaning postulates would be analytic truths, and could be given a piori; however, you both agree with Quine's criticism of Carnap's use of the analytic/synthetic distinction, and deny that just-is statements can (in general) be justified a priori (§ 2.1). In a sense, this cost-benefit analysis may still be reminiscent of Carnap's idea that linguistic frameworks are accepted on the basis of pragmatic reasons. Cold you help our readers to understand how this cost-benefit analysis in the acceptance of just-is statements may proceed, and to which extent your view is inspired by some of Carnap's insights?

AR: My work owes a great deal to Carnap. (I like to think of my view as post-Kripkean Carnapianism.) Like Carnap, I hold that the choice of one's language of inquiry is to be guided by pragmatic considerations. But whereas Carnap can be read as thinking that once a language has been selected the task of identifying the analytic truths can be carried out *a priori*, my own view is that even after a language has been selected one may need to turn to pragmatic considerations in deciding which just-is statements to accept. (There may not be a deep disagreement here. It is possible that Carnap would have seen my view as a version of his own.)

So what sorts of pragmatic considerations should one use in deciding what just-is statements to accept? Accepting a just-is statement comes with costs and benefits, and I think one should make one's decision on the basis of whether one takes the costs to be outweighed by the benefits.

To get a sense of the costs and benefits I have in mind, it is useful to consider an example:

> To experience the sensation of seeing red *just is* to be in such-and-such brain state

The benefit of accepting this just-is statement is that one is relieved from the task of having to explain of why people in the relevant brain experience the sensation. (So, for example, there is no need to explain why we don't have "inverted spectra"). The cost is that one looses the ability to use a distinction between experiencing the sensation and being in the brain state as part of one's theorizing. (So, for example, one cannot use this distinction in explaining what Jackson's Mary learns when she first sees a red tomato.)

8. *Let us turn to a topic you dealt with in other works, and which is of particular interest to our readers: vagueness. A default and popular position on vagueness is that vagueness is a semantic phenomenon. By using a famous phrase of Russell, the idea is that vagueness is in the system of representation and not in the things represented. This idea has often been implemented by means of non-classical semantics (supervaluationism is the best-known semantics offered in this spirit). In your "*A Metasemantic Account of Vagueness*" [2010] you have offered a different analysis of vagueness as a semantic phenomenon (which you have further explored in other works, such as "*Vague Representation*" [2008]). The metasemantic view has in the meantime acquired consensus from philosophers such as Matti Eklund and Nicholas Smith (and was perhaps present in McGee's interpretation of his joint work with McLaughlin on supervaluationism), who distinguish from first-order indeterminacy (indeterminacy of the truth-value expressed by assigning a third semantic value different from truth and falsity) from second-order indeterminacy (indeterminacy in the assignment of semantic status). Could you tell us something more about this approach and what led you to*

depart from the mainstream semantic approaches to vagueness?

AR: On traditional accounts of vagueness, vague expressions have a distinctive type of semantic value: a semantic value that is "incomplete", or "multi-valued", or otherwise non-standard. On the account of vagueness I favour, in contrast, there is nothing special about the semantic values of vague terms. What makes vague terms different is the way in which speakers assign them (unremarkable) semantic values.

I was led to this view in two different ways. The first is that I became increasingly skeptical about the prospects of an account of vagueness based on non-standard semantic values. The problem, in a nutshell, is that I see no way of defining a semantic value -- standard or not -- that doesn't involve cutoff points of some kind or other, and, when it comes to a vague term, the location of such cutoff points will seem arbitrary regardless of where they end up.

The second reason I became attracted to the view I now hold is that I became a "localist" about meaning. More specifically, I came to believe that our words don't generally have stable linguistic meanings. What happens instead is that in the course of a conversation we rely on a combination of sensitivity to context and common sense to come up with *temporary* assignments of meanings to the words occurring in our assertions: an assignment which is suitable for the purposes at hand, but not necessarily suitable for other contexts.

A nice feature of semantic localism is that it allows for a natural explanation of the phenomenon of vagueness. For the localist is in a position to claim that although the meanings that are temporarily assigned to vague terms have cutoff points, the location

of the cutoff points ceases to be a problem. For as long as speaker and hearer are able to coordinate about how to distinguish amongst the possibilities that are relevant for the purposes of the conversation, they can place the cutoff points wherever they want.

9. *Many thanks for your answers. Let us ask you, in conclusion, an advice for young scholars in philosophy. Everywhere the Humanities, and pure philosophy above all, are being suffering from budgets cuts and from what appears to be an ever-increasing predominance of natural sciences. What role do you think philosophy, especially analytic philosophy, can still play in our present intellectual life, and what areas of philosophy would you feel to suggest to young students as the most promising ones, or the ones which stand in need of more rational explorations?*

AR: I am a big fan of the natural sciences, but I think it is serious mistake to neglect the pursuit of basic knowledge by funding only projects with obvious practical applications. This is certainly true if one values knowledge for its own sake (as I believe any civilized nation should), but it is true *even if* one is primarily interested in practical applications. For it is hard to predict from our current perspective where the most fruitful avenues of research will lie. We must let a thousand flowers bloom.

I don't know where academic philosophy is heading. But it is worth keeping in mind that philosophical thinking has stood the test of time: it has remained alive over the centuries, surviving periods of far greater intellectual adversity than our own. I think there is little doubt that it will continue to thrive, even if the resources devoted to academic philosophy ebb and flow.

In choosing an area of philosophy to work in, I have a strong recommendation: follow your heart. Producing good philosophy is hard enough; it is harder still if one feels compelled to work on a topic one is not passionate about. It seems to me, moreover, that an adverse academic environment makes following one's heart more urgent than ever. For if one is to put up with the trouble of devoting one's life to philosophy under adverse conditions, one might as well work on topics that one cares about deeply.

References

Eklund M. (2010), "Vagueness and Second-Level Indeterminacy", in R. Dietz, S. Moruzzi (eds.), *Cuts and Clouds: Vaguenesss, its Nature and its Logic*, Oxford University Press, Oxford.

Hale B., Wright C. (eds.) (2001), *The Reason's Proper Study: Essays Towards a Neo-Fregean Philosophy of Mathematics*, Oxford University Press, Oxford.

McGee V., McLaughlin B. (1995), "Distinctions Without a Difference", *Southern Journal of Philosophy*, 33 (S1), pp. 203-251.

Rayo A. (2003), "Success by default?", *Philosophia Mathematica,* 11 (3), pp. 305-322.

Rayo A. (2005), "Logicism reconsidered", in S. Stewart (ed.), *The Oxford Handbook of Philosophy of Mathematics and Logic*, Oxford University Press, Oxford, pp. 203-235.

Rayo A. (2008), "Vague representation", *Mind*, 117 (466), pp. 329-373.

Rayo A. (2010), "A metasemantic account of vagueness", in R. Dietz, S. Moruzzi (eds.), *Cuts and Clouds: Vagueness, its Nature, and its Logic,* Oxford University Press, Oxford, pp. 23-45.

Rayo A. (2013), *The Construction of Logical Space*, Oxford University Press, Oxford.

Rayo A., Uzquiano G. (eds.) (2006), *Absolute Generality*, Oxford University Press, Oxford.

Smith N. J. J. (2008), *Vagueness and Degrees of Truth*, Oxford University Press, Oxford.