

CARNAP'S AND QUINE'S DEBATE ON SEMANTIC AUSTERITY: REVALUING THEIR EMPIRICIST EXTENSIONALISM

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Resumo: Vou argumentar que a simpatia de Carnap e de Quine pela tese da extensionalidade pode ser considerada consequência de sua preocupação com critérios lógicos claros para a manipulação—isto é, identificação e permutação—de termos linguísticos. A inclinação de Quine de ver a extensionalidade como um evitar de confusões semânticas desencadeou sua profunda admiração pelos trabalhos iniciais de Carnap, que têm uma natureza deveras extensionalista. Porém, Quine se deu conta, na década de 1930, que Carnap não tem a mesma resistência a admitir objetos intencionais. Já no *Aufbau* (1928), a abordagem fenomenalista e estruturalista do conhecimento de Carnap leva à conclusão de que o psíquico próprio e o psíquico de outros não são algo, em princípio, inacessíveis ao conhecimento. Em adição aos desenvolvimentos históricos da semântica—que influenciaram Carnap—existem duas razões fundamentais para a crescente tolerância de Carnap da terminologia e da análise intensional na filosofia da linguagem. Em primeiro lugar, Carnap pensa ser possível manter um discurso sobre intensões sem isto levar a um compromisso ontológico a entidades intensionais abstratas. Em segundo lugar, o critério behaviorista para a identificação de intensões que ele oferece demonstra que ele acreditava ser possível encontrar critérios claros de identificação para intensões. Mostrarei por que Carnap diverge nesses dois pontos, no seu período semântico, de Quine.

Palavras-chave: A tese da extensionalidade; objetos intensionais; compromisso ontológico; Rudolf Carnap; Willard Van Orman Quine.

Abstract: In this paper I will show why Carnap's and Quine's sympathy for the extensionality thesis can be considered equivalent to their concern with clear logical criteria for the manipulation—that is, identification and permutation—of empirical linguistic terms and also why Carnap renounced to the extensionality thesis in the late 1930s. Quine's inclination to see extensionality as an avoidance of semantic confusion triggered his profound admiration for Carnap's early works, which are very much of an extensionalist nature. But Quine realizes, as early as the 1930s, that Carnap does not have the same resistance to admitting intensional objects. Already in the *Aufbau* (1928), Carnap's phenomenalist and structuralist approach to knowledge, and his pragmatic approach to language systems, leads to the conclusion that the self-psyche and others' psyche are not something, in principle, inaccessible to knowledge, and, therefore, that intensional—including intentional—objects could, in principle, be scientific objects. In addition to the historical development of semantics—which influenced Carnap—there are two fundamental reasons for Carnap's increasing tolerance of intensional terminology and analysis in the philosophy of language. In the first place, Carnap thinks it possible to maintain a discourse on intensions without this leading to an *ontological commitment* to *abstract intensional entities*. Second, the behaviourist criteria for the identification of intensions that he offered demonstrates that he believed it possible to meet clear identification criteria for intensions. I will show why Carnap disagrees on these two points, in his semantic period, with Quine.

Keywords: Extensionality Thesis, Rudolf Carnap, Willard V. O. Quine, Semantic Austerity.

1. Empiricism and extensionalism

Quine's aim of reconstructing the formulation of scientific theories bears strong similarities to Carnap's epistemological projects. One particular similarity is the defence of the extensionality thesis and some aspects of their empiricist point of view. Carnap's and Quine's sympathy for the extensionality thesis can be considered a consequence of their concern with clear logical criteria for the manipulation—that is, identification and permutation—of linguistic terms. Frege's, Russell's, and Whitehead's logicism are of fundamental importance to both, and determine their conceptions of how scientific theories are structured.

The logical worries that determine Carnap's and Quine's epistemologies determined the empiricist position they assume. The discourse on *empirical extensions* is a way of safeguarding the possibility of using logical principles, such as the extensionality thesis. But their empiricist reasons are not to be interpreted merely as *effects* of their logical predilections. Just as classical logic offers safety in the manipulation of linguistic constructions, the *empirical base* appears to offer firm ground for the evaluation of the content of scientific concepts, whose relations logic and epistemology deal with. Throughout Quine's work and up to Carnap's syntactic period, the extensionality thesis and empiricism appear to be complementary.

However, despite all the trust placed in empiricism, there is no way of avoiding the question: Are *empirical extensions* clearly identifiable in order to serve as the basis for intersubjective communication in science and in everyday activities, or for *permutation*, in logic, between linguistic terms that refer to them? While affirming the inscrutability of reference, Quine considers the discourse on observation adequate. He thinks that empirical evidence, together with some pragmatic criteria, can help us decide whether theories about reality are acceptable or not—since there is the possibility of an intersubjective agreement on what is observed—, and thinks it possible to decide on the permutation of terms that describe extensions within a conceptual scheme. Even admitting, from the late 1940s, the reference to abstract entities such as classes, Quine keeps concrete objects as examples *par excellence* of clearly identifiable entities. But if there is such a connection between reliance on the identification of empirical extensions and the possibility of maintaining the extensionality thesis, why, then, does Carnap remain faithful to empiricism and renounce the extensionality thesis in the late 1930s?

1.1 Carnap and Quine: The Extensionality Thesis

Quine argues that a language that is merely extensional can solve

problems of communication and allow interlocutors and scientists to reach agreement on the objects to which they wish to refer. As such, it can be said that he is following the ideal of logical empiricism in developing an objective form of language that favours communication and lends support to science. For a language to be considered purely extensional, it must permit “*salva veritate* substitutions”. As a means of justifying their defence of the extensionality thesis, both Carnap—in *Der Logische Aufbau der Welt*, 1928—and Quine—in *Word and Object*, 1960—struggle to demonstrate that it is possible to *eliminate* intensional languages without prejudice to scientific activity, something which both philosophers have in mind when they seek to *free* scientific language from its *obscurities*.

According to Quine, his sympathy with the extensionality thesis stems from his investigations in logic, during the writing of his doctoral thesis. His inclination to see extensionality as an avoidance of semantic confusion triggered his profound admiration for Carnap’s early works, which are very much of an extensionalist nature:

I was not abetted in my extensionalism by the Harvard professors of that time. [...] But a postdoctoral fellowship the next year took me to a kindred spirit in Czechoslovakia: the great Carnap. He was just finishing his *Logische Syntax der Sprache* [...]. He was setting his face steadfastly against modal logic and mentalistic talk of meanings. His little logic text *Abriss der Logistik* had likewise been impeccably extensional, as was his impressive application of mathematical logic to epistemology in *Der logische Aufbau der Welt*. (QUINE, 1991, p. 166).

Quine’s vindication of the extensionality thesis is related to his criticism of semantic terms related to intensions of sentences and expressions, such as “meaning”, “synonymy”, and “analytic”. This criticism is based on his claim that the definitions of terms like these, which have been posited by several philosophers over time, do not offer a satisfactory criterion for the identification of intensions. Quine would like to know how it is possible to reach the conclusion that two sentences have the same meaning, or how to arrive at the conclusion that two general terms have the same meaning and, if one term is a subject and the other a predicate, how they can form an analytic sentence. He affirms that there is, in fact, no acceptable criterion for determining meaning, and, in *Two Dogmas of Empiricism* (1951a), as is widely known, he demonstrates his dissatisfaction with the aforementioned semantic terminology by systematically criticising many attempts made to define the notion of “analyticity”. Quine asserts that none of these attempts really achieves the main aim of any satisfactory definition, namely to provide a criterion for the classification of those sentences which are analytic, and for separating them from those which are not.

Unlike semantic terms that refer to intensions, those terms that deal with extensions, such as “reference”, “sameness of extension”, and “truth”, do not lack criteria of identity for their application.¹ It is possible to establish, according to Quine, a behaviourist criterion based on observation of the use of linguistic expressions, which permits the *objective* (intersubjective) use of the semantic terms concerned. In other words, this criterion allows philosophers of language or linguists to reach agreement on whether two different expressions in a linguistic system have, for example, the same extension, and can be permuted without any change in the truth-value of the resulting sentence.

Quine sustains the extensionality thesis throughout his work.² Even in 1995, in his book *From stimulus to science*, Quine states:

A context is *extensional* if its truth value cannot be changed by supplanting a component sentence by another of the same truth value, nor by supplanting a component predicate by another with all the same denotata, nor by supplanting a singular term by another with the same designatum. Succinctly, the three requirements are substitutivity of *covalence*, of *coextensiveness*, and of *identity, salva veritate*. A context is *intensional* if it is not extensional. Extensionality is much of the glory of the predicate logic, and it is much of the glory of any science that can be grammatically embedded in predicate logic. (QUINE, 1995, p. 90)

We see that Quine regrets Carnap’s *retreat* towards intensional terminology in his works following *Die Logische Syntax der Sprache* (1934). Quine notes that as early as 1930s there was a gap between his extensionalist view and Carnap’s opinions: “I was diverging from Carnap because his aloofness from intensions and mentalism, which had so appealed to me, had proved to be insufficiently austere. Ironically, in those same years Carnap came to welcome intensions increasingly” (QUINE, 1991, p. 267).

¹ In addition to *Two Dogmas of Empiricism*, Quine published *Ontology and Ideology* (1951b), in which he clearly establishes the division of semantics in a theory of meaning, which uses terms such as “analyticity” and “synonymy”, and a theory of reference, which deals with, for example, questions concerning the denotation and extension of linguistic expressions.

² “[...] the thesis of extensionality is the further claim that the universal language of science, when completed, will be purely extensional. A purely extensional language of the kind envisioned would be one that contains only those grammatical constructions (or modes of composition) where in general: (a) a singular term can be supplanted by any other co-designative term (i.e., a term referring to the same object) without disturbing the truth value of the containing sentence (for example, by supplanting ‘Tully’ in ‘Tully was a Roman’ by ‘Cicero’); (b) a general term can be supplanted by any other co-extensive term (i.e., a term true of the same objects) without disturbing the truth value of the containing sentence (for example, supplanting ‘is a creature with kidneys’ in ‘Fido is a creature with kidneys’ by ‘is a creature with a heart’); (c) a component sentence can be supplanted by any other sentences of the same truth value without disturbing the truth value of the containing sentence (for example, supplanting ‘Lincoln was assassinated’ in ‘Lincoln was assassinated and Kennedy was assassinated’ by ‘Nixon was president’)” (GIBSON Jr., 1982, p.107).

Thus, in spite of both Quine and Carnap (in the *Aufbau*, 1928) valuing classical logic as an instrument of clarification for scientific and ordinary language, and their finding it profitable for science to present language in a purely extensional way—as happens with languages within the scope of classical logic—, Quine realizes, as early as the 1930s, that Carnap does not have the same resistance to admitting intensional objects.

But one must remember that Carnap, even in the *Aufbau*, does not simply eliminate reference to intensional objects in his construction of the world. Of course, intensions, as representations of epistemic orders, representations of how objects have been known—as objects whose representations may be elicited by the enunciation of linguistic expressions—are *not objective* in the sense of being the same for all subjects, they are not what makes intersubjective communication possible. Thus, Carnap in the *Aufbau* is far from arguing that intensions or senses are objective, as Frege does. Yet, in his phenomenalist and structuralist approach to knowledge, the self-psyche and others' psyche, or *subjective events*, are not something, in principle, inaccessible to knowledge. So, he does not deny the possibility of reaching knowledge, if only in a mediated way, of psychic events, among which we find many kinds of *intensional objects*.

When he is reflecting on the extensionality thesis, Carnap (*Aufbau*, 1928) starts with Frege's distinction between sense (*Sinn*) and reference (*Bedeutung*). Depending on how a statement about a sentential function is expressed, one will speak of the 'Sinn' (sense) or 'Bedeutung' (reference) of the function, but not of both at the same time. For example, says Carnap, in the statement "[7] is an odd number", the symbol '7' is indicating its reference (the reference of the symbol), and in the statement "I just had representation 7", the symbol '7' is indicating its sense (the symbol's sense). The statements in which symbols—which may represent statements, sentential functions, or objects—indicate the reference of what they represent are called *nominatum* statements (*Bedeutungsaussage*), and the statements in which symbols indicate senses are called sense statements (*Sinnaussage*). The *nominatum* statements are extensional and the sense statements are intensional. According to Carnap, the sense of a symbol is that which "the intensional objects, i.e., representations, thoughts, etc., which the sign is to evoke, have in common", and by the reference of a symbol is meant "the object which it designates" (CARNAP, 1969 [1928], §44). After making this distinction between extensional and intensional sentential functions, and explaining what each of them is talking about, Carnap somewhat abruptly concludes that after all there are in fact no intensional statements about sentential functions:

Thus the thesis of extensionality is valid: there are no intensional statements about propositional functions; what were taken to be such were actually not statements about propositional functions, but statements about their sense. Every statement that does not concern the sense of a propositional function, but the function itself, retains its truth value if any coextensive propositional function whatever is substituted; i.e., it can be stated in the form of an extensional statement. (CARNAP, 1969, *Aufbau*, § 45).

So, according to Carnap, when we affirm a sentential function, we are talking about its extension and not its intension, because to speak of its intension we have to show that we are not using the function in a common way; we are trying to express something ‘other’ of the normal reference of the function, we are trying to express a representation or thought.³

1.2 Quine’s critique of intensional objects and his behaviourist view of language learning

After writing on many issues related to the extensionality thesis for three decades, Quine systematizes his views on the subject in *Word and Object* (1960). Two key points in Quine’s defence of extensionality appear in his main book. The first of these concerns his emphasis on the importance of transparent contexts for intersubjective agreements and scientific objectivity. The second relates to his concern about the lack of objectivity and criteria for identity in relation to intensional objects, which are presumably being referred to in obscure contexts. Nevertheless, as a result of Quine’s plea for the indeterminacy of translation, the inscrutability of reference, and ontological relativity, as well as his criticism of the lack of logical criteria of identification of intensions—all of which form the basis and scope of his criticism of the notion of meaning—it is not evident that extensional contexts are any clearer concerning the objects they refer to than intensional contexts.

As regards Quine’s criticism of intensional languages and objects, the thesis of the indeterminacy of translation—which springs from Quine’s behaviourist view of language-learning, and flows into his vindication of the ontological relativity thesis, thus appearing to jeopardise the determination of reference of linguistic expressions—proves to be of use when he criticizes the discourse that contains intensional terminology, allegedly about intensional objects. Even though his naturalist-behaviourist explanation⁴ of language-learning is one of Quine’s main arguments against the notion of meaning—based on which he concludes that indeterminacy exists in all our attempts to translate any language—, he also argues against intensional languages from

³ As I said earlier, when Carnap relates intentions to Fregean senses, he relativizes Frege’s caution to maintain the objectivity of senses and to distinguish them from subjective representations.

⁴ This expression is used by Roger Gibson (1982) to refer to Quine’s view of language.

another angle by carrying out a logical-semantic analysis that demonstrates the impossibility of finding a satisfactory logical-semantic criterion of identity for intensional objects.

In response to the possible accusation that it is not only intensional objects that lack a precise criterion of identity, Quine makes the following comments in his paper *Three Indeterminacies*:

The phrases ‘inscrutability of reference’ and ‘ontological relativity’ dominated my account of these matters, and kindly readers have sought a technical distinction between them that wasn’t clear in my own mind. But I can now say what ontological relativity is relative to, more succinctly than I did in the lectures, paper and book of that title. It is relative to a manual of translation. To say that ‘gavagai’ denotes rabbits is to opt for a manual of translation in which ‘gavagai’ is translated as ‘rabbit’, instead of opting for any of the alternative manuals.

And does the inscrutability or relativity extend also somehow to the home language? In ‘Ontological relativity’ I said it did, for the home language can be translated into itself by permutations that depart materially from the mere identity transformation, as proxy functions bear out. But if we choose as our manual of translation the identity transformation, thus taking the home language at face value, the relativity is resolved. Reference is then explicated in paradigms analogous to Tarski’s truth paradigm; thus ‘rabbit’ denotes rabbits, whatever *they* are, and ‘Boston’ designates Boston. (QUINE, 1990b, p. 6)

Thus, in spite of the ontological relativity that affects the reference of terms which are regarded extensionally, Quine encounters a criterion of identity in reference which he is not able to find for intensional objects.⁵

2. Logical syntax

Quine, in his comments on Carnap, emphasizes that until Carnap’s syntactic period, while preserving the extensionality thesis in his writings, there was no significant divergence between them. Illustrative of Quine’s thinking about Carnap’s philosophical views in the syntactical period are comments made in the three “Lectures on Carnap”, presented in November 1934 and published in the correspondence between the two authors. These lectures consist of an introduction to Carnap’s book *Logische Syntax der Sprache* (1934). Quine then agreed with the Carnapian point of view that philosophy should be seen as a logical syntax. For Quine, the ideas advocated by Carnap had the great advantage of allowing the progress of philosophy without the weight of

⁵ For a detailed discussion of the differences we find between Quine’s apparent relativism in relation to language choices and Carnap’s pragmatic principle of tolerance in relation to different languages, see HYLTON (2004), where it is said: “The contrast with Carnap is that for Quine there is a correct answer to the question of language choice. If one theory enables us to predict and deal with events better than another, then the language of the first is the one we should accept. And in accepting it, we no doubt accept a certain range of entities as existing—we accept an ontology” (Hylton in GIBSON, 2004, p. 134).

metaphysics. In 1934, Quine still did not deny the distinction between analytic and synthetic statements, despite seeing some theoretical problems in Carnap's definition of analytic statements, which was anchored in the notion of "convention". In the first conference of 1934, Quine, showing his agreement with Carnap's assessments, states:

Carnap's thesis that philosophy is syntax is thus seen to follow from the principle that everything is analytic except the contingent propositions of empirical science. But like the principle that the *a priori* is analytic, Carnap's thesis is to be regarded not as a metaphysical conclusion, but as a syntactic decision. This conclusion should be gratifying to Carnap himself: for if philosophy is syntax, the philosophical view that philosophy is syntax should be syntax in turn; and this we see it to be. (QUINE in CREATH, 1990, p. 66)

Quine continued to accept, in 1934, not only the notion of analyticity but also intensional notions, such as that of synonymy. Although he had perceived the problems involved in the definition of these intensional terms and their acceptance, he could agree with Carnap's logical syntax because the definitions proposed by Carnap resorted to logical consequence relations and to the rules of transformation given without needing to use notions such as 'meaning'. Instead of speaking of the meaning of a sentence, Carnap speaks, in *Die Logische Syntax der Sprache*, about "content", and defines it as "the class of all the non-analytical consequences" of the sentence. This kind of definition appealed to Quine, since it did not refer to any kind of intensional object, thus preserving the possibility of applying the extensionality thesis. Still somewhat removed from the behaviourist explanation of language-learning, Quine demonstrates, in 1934, admiration for the Carnapian delimitation of philosophical objects, which draws a definite outline—with narrow dimensions—for philosophical discourse. Thus, we see in Quine's sympathy for Carnap's syntactical period the same logicistic and extensionalist tendency of his future writings, but still devoid of the empiricist and behaviourist traits of his semantic holism. In presenting the ideas of Carnap on the role of philosophy as a logical syntax, Quine shows his preference, as he says, for a discourse committed to the rigor of logic and devoid of ill-defined and ambiguous terminology of traditional semantics:

In the analysis of concepts and doctrines, both in the logic of science and in other branches of philosophy, we are continually encountering or seeming to encounter the problem of *meaning*. But these examples are sufficient to suggest that such problems arise only through careless formulation; we are brought to problems of meaning through use of such relations as *mentioning*, *denoting*, etc., and these relations come in only through use of the quasi-syntactic idiom. When the quasi-syntactic idiom is eliminated we find ourselves working within the syntactic level quite independently of the meaning-relation. (QUINE in CREATH, 1990, p. 93).

In his writings after 1934, Quine gradually incorporates his empiricist view of knowledge into his logicist leanings. The behaviourist analysis of reference, which, at least until 1934, according to Quine, would have to be performed by empirical psychology, will gradually be admitted into the discourse of a *naturalized philosophy*. But in 1934, Quine still states:

This so-called *linguistic* behavior on the part of men stands in certain empirical correlations or cause-and-effect relations with the objects of the second part, the environment. Among these empirical correlations it may or may not prove to be experimentally useful to single out and define a certain complex relation which may be called the relation of *denotation*: a relation of certain ingredients of man's colloquial and literary behavior to certain ingredients of the environment. But all this belongs to empirical psychology, and is no different in principle from the procedure in any other empirical science. (QUINE in CREATH, 1990, p. 93).

Thus Quine, in 1934, shows appreciation for Carnap's *syntactical* view, largely because he envisages a way of avoiding the discourse on the *meaning* of terms and sentences. As seen in previous quotations, Quine does not, at this time, make a clear distinction between a theory of meaning and a theory of denotation.

3. Tarski's influence and Carnap's semantics

Tarski's theory of truth, presented in his article "Der Wahrheitsbegriff in den formalisierten Sprachen", published in Polish in 1931 but translated into German in 1936, gave Carnap the means to revise his syntactical position. The definition of truth, hitherto inaccurately formulated, had, with Tarski, gained an accurate formulation comparable to other definitions of the logical syntax. Thus, the study of semantical linguistic functions—viewed previously with suspicion by Carnap—appeared, after 1936, could now be developed with the same precision as that of syntax. Semantics, which in the *Aufbau* (1928) was represented by discourse on the constitution of objects—or concepts—of experience (*Erlebnisse*), was revived and renewed by Tarski's definition of truth. Without the danger of falling into a discourse on "sense-data" or "experiences", which is not admissible in a critical philosophy of language that aims to establish the limits of what is *sayable*, Tarski's semantics emerged in the 1930s as a coherent and defensible alternative that would assist in the development of theories about meaning and reference. However, according to Ernst Tugendhat, in "Tarski's semantische Definition der Wahrheit und Ihre Stellung der Geschichte der Wahrheitsprobleme im logischen Positivismus" (1960), despite Carnap's expecting to be able to apply Tarski's semantics to both formal and natural languages, and thus solve the problems posed by semantic analysis of scientific and everyday statements, Tarski himself sees limits in the application of his definition of truth.

Even though he was aware of Tarski's reservations about the use of his definition of truth for natural languages, Carnap considered such an application feasible. The way Carnap inserted Tarski's semantics into his logical syntax provoked criticism of varying degrees. According to Tugendhat, for example, Carnap's resumption of semantics, while seemingly solving problems of classical empiricism over the relation of language to experience, consisted only in incorporating a formal definition of truth into a formal syntactical system. For Tugendhat, it did not mean the resolution of semantical problems arising from the study of scientific or natural language as traditionally developed by logical empiricism. Tugendhat considers it an error that Carnap's semantics does not take into account epistemological problems traditionally approached by philosophy.

Quine had also criticized Carnap's new semantical approach. In a letter dated 10th May, 1943, Quine questions Carnap's claim that he can define analyticity for both formal and natural languages. According to Quine, it is not difficult to forge a definition of analyticity for formal languages, since such a definition could be a stipulation of the philosopher or linguist and since a formal language is also a construction of the scholar and is not something that has autonomy and subsists independently. However, in addition to being a construct of the researcher, formal languages, according to Quine (QUINE in CREATH, 1990, p. 338), if properly thought, should consist of attempts to reproduce rules and features present in the natural language; that is, although artificial languages do not have to be an exact reproduction of natural language, they must, in order to be linguistically relevant, seek an approximation with natural languages. For Quine, it is not satisfactory to simply stipulate, for example, by means of semantical rules, what an analytic sentence is. This stipulation always presupposes a certain notion of analyticity, which can only come from natural language, from the everyday use of language. This notion needs to be elucidated—and semantical rules fail to do just this—since it presupposes the notion to be elucidated. This same argument appears, eight years later, in "Two Dogmas of Empiricism" (1951a).

At no time does Carnap claim to disagree with Quine's view that the formal definition of analyticity should clarify the intuitive notion we have of this concept. On the contrary, Carnap agrees with Quine on this. But he sees no reason why the philosopher should not be satisfied with formal definitions of intuitive notions. Despite the inevitable limitation of these definitions, often applicable to one language and not the other, Carnap believes that this is precisely the role of semantics: to elaborate exact definitions, such as the definitions of truth or analyticity, based on intuitive notions:

Our rules [semantic rules] are meant [...] neither as an assertion nor as a mere nominal definition, which serves as an abbreviation. Their purpose is, rather, the explication of an inexact concept already in current use. The rules denote a certain class (or, as I would prefer to say, a property) of sentences in Lo. This definition, however, is not arbitrary; we advance the claim that the defined concept embraces what philosophers have meant, intuitively but not exactly, when they speak of ‘analytic sentences’ or, more specifically, of ‘sentences whose truth depends on their meanings alone and is thus independent of the contingency of facts’. (CARNAP, 1952, p. 430).

Quine’s and Carnap’s arguments seem to cross without affecting each other. Quine insists that it is necessary to observe the *in loco* operation of ordinary language to try to explain semantic notions. Carnap is comfortable with rough formal explanations of semantic notions. What is the primary difference between them? It looks, at first, to be more a difference of focus and method than of content itself. Quine thinks that only the scrutiny of linguistic behaviour can clarify semantic notions; Carnap relies on the possibility of defining these notions from their already established use. If so, Carnap may be right when he claims that he can perceive no essential divergence between his and Quine’s stance. However, Quine’s critique of the analytic–synthetic distinction appears, in a second moment, to actually move him theoretically away from Carnap.

3.1. Carnap’s on intensions: *Meaning and Necessity* (1947)

The most well-known and debated piece from Carnap’s semantic period is *Meaning and Necessity* (1988a [1947]). Highly complex and precise, this work elaborates three possible semantic systems (S_1 , S_2 , S_3) with the aid of metalanguages (M , M'). The first system constructed and analysed by Carnap is the formal system S_1 , which contains the logical symbols: predicate constants, individual constants, connectives, universal and existential quantifiers, and the *iota* and *lambda* operators. S_1 is defined by Carnap as an extensional system. This means that it only contains sentences or designators—they can be sentences, predicates or individual expressions—that “contextualize extensively” expressions contained within them. Carnap states that: “We say that a sentence is *extensional* with respect to an expression occurring in it or that the expression occurs in the sentence *within an extensional context*, if the expression is interchangeable at this place with every other expression equivalent to it” (1988a [1947], p. 46).

S_2 on the other hand is not only extensional, since it contains modal operators that “contextualize intensionally” the expressions contained within them. An intensional context is described by Carnap as follows: “We say that the sentence is *intensional* with respect to the expression, or that the expression

occurs *within an intensional context*, if the context is not extensional and the expression is L-interchangeable at this place with every other expression L-equivalent to it” (1988a [1947], p. 46).

Two expressions are interchangeable if a sentence maintains its truth-value in the case of permutation of one by another. If the sentence’s intension remains the same in the case of permutation of one by the other, the expressions are considered *L-exchangeable*. It is noted that in order to distinguish between extensional and intensional contexts, Carnap needs the distinction between factual or empirical equivalence, which he calls *equivalence* or *F-equivalence*, and logical equivalence, which he calls *L-equivalence*. Both concepts are defined by Carnap with the help of the concepts of “truth in S” and “L-truth in S”. The contexts created by propositional attitudes are, for Carnap, neither intensional nor extensional. To address these contexts, Carnap proposes the notion of *intensional structure*, which, according to him, is *stronger* than the notion of intension. Intensional structure is as follows: “If two sentences are built in the same way out of designators (or designator matrices) such that any two corresponding designators are L-equivalent, then we say that the two sentences are *intensionally isomorphic* or that they have the same *intensional structure*” (1988a [1947], p. 56)

Following in the footsteps of Frege, Carnap attributes to every designator (sentence, predicate or individual expression) an intension and an extension. In this way, he overcomes the extensionalist phase of his philosophy of language. Language does not need to be completely interpreted by a system of merely extensional symbols. He no longer admits—as he sustained in the *Aufbau*—that languages are genuinely extensional, or that they only *seem* to be intensional. In *Meaning and Necessity*, he admits that every linguistic expression has two aspects, i.e., it relates to two entities, the intension and the extension:

As we have seen earlier (§27), a designator stands primarily for its intension; the intension is what is actually conveyed by the designator from the speaker to the listener, it is what the listener understands. The reference to the extension, on the other hand, is secondary; the extension concerns the location of application of the designator, so that, in general, it cannot be determined by the listener merely on the basis of his understanding of the designator, but only with the help of factual knowledge. (1988a [1947], p. 157).

In spite of analysing the symbols of the semantic systems with both notions of intension and extension, Carnap admits that it is possible to reduce or translate the extension of a designator into its intension, as well as possibly *interpreting*—not exactly translating—the intension of a designator by means of its extension. However, translation or interpretation do not *eliminate* extensions or

intensions of semantic systems. Carnap insists that this kind of translation should not be seen as an *elimination* of one of the two essential aspects of every designator:

Now the decisive point is the following: As explained previously (§ 35), there is no objection against regarding designators in a modal language as names of intensions and regarding variables as having intensions as values, provided we are not misled by this formulation into the erroneous conception that the extensions have disappeared from the universe of discourse of the language. As explained earlier (§ 27), it is not possible for a predicator in an interpreted language to possess only an extension and not an intension or, in customary terms, to refer only to a class and not to a property. Similarly, it is impossible for a variable to be merely a class variable and not also a property variable. (1988a [1947], p. 199).

The intension of a predicate P is the property P and the extension of this predicate is the corresponding class. The extension of a sentence is its truth-value and its intension is the proposition it expresses. The extension of an individual expression is the individual it refers to—the *descriptum*, if it is a description—and the intension is the individual concept it expresses. Although Carnap draws on Frege’s (1986 [1892]) already classical division between meaning and reference (*Sinn und Bedeutung*), he also wants to surpass Fregean semantics with its division between the extension and the intension of a designator. This is because Frege’s semantic theory, encompassed, according to Carnap, in the tradition of the “method of name-relation”, brings with it some disadvantages that may be avoided through its semantics of formal languages. Among these, Carnap includes the tendency of formalized Fregean semantics to “doubling or multiplying names”. To refer or denote any entity (*nominatum*) it is necessary to use a name, say n_1 . This name, in addition to referring to or denoting an object, also expresses a meaning. So to speak of the meaning of a name it is necessary to use another name, n_2 , since only names refer to entities and meaning would be a kind of entity. However, the name we use to speak of the meaning of n_1 also expresses a meaning, which, in turn, must be able to be referred to by another name, in this case n_3 . In this way, we fall into an infinite regress when trying to use the nominal relation method:

Generally speaking, if we start with any name of a customary form, we have, first, two entities familiar to us: its ordinary *nominatum* and its ordinary sense; they are the same as its extension and its intension, respectively. Then Frege’s method leads, further, to an infinite number of entities of new and unfamiliar kinds; and, if we wish to be able to speak about all of them, the language must contain an infinite number of names for these entities. (1988a [1947], p. 130).

According to Carnap, his method of intension and extension does not have the hindrances presented by the nominal relation method. His method, among other things, would prevent the multiplication of names. With his

method one doesn't need, for example, two distinct symbols for properties and classes, two different names. Properties and classes are the intensions and extensions expressed by a designator. So there would be only two entities for each designator, and multiplying names would no longer be needed to speak of these entities:

On the basis of the method of extension and intension, on the other hand, we need in the object language, instead of an infinite sequence of expressions, only one expression (for instance, in the first example 'Hs', in the second 'H'); and we speak in the metalanguage only of two entities in connection with the one expression, namely, its extension and its intension (and even these are, as we shall see later, merely alternative ways of saying the same thing). (1988a [1947], p. 131).

Carnap develops an alternative metalanguage M' , which he calls neutral metalanguage, to demonstrate that it is possible not to speak of extensions and intentions of sentences, predicates, and individual variables. That is, M' would more clearly mirror—without ever using the terms 'extension' and 'intension'—what actually occurs in an object language: every expression relates in two distinct ways to two distinct entities. For example, instead of stating, as in metalanguage M , that “The extension of 'H' in S_1 is the Human class” and “The intension of 'H' in S_1 is the Human property”, it is stated in the metalanguage M' , on the one hand, that “‘H’ means Human” and, on the other hand, that “‘H’ L-designates (designates logically) Human”. The designation relation in M' corresponds to the relation between the designator and its extension in M ; the relation of the L-designation in M' corresponds to the relation between the designator and its intension in M . To clarify what this means, Carnap shows how one can reintroduce the non-neutral expressions “class” and “property” in M' by means of the following contextual definitions: “‘H’ designates the Human class” and “‘H’ L-designates the Human property”. Carnap describes the advantages of metalanguage M' as follows:

The distinctions made in M are not neglected in M' but are represented in a different form. Instead of an apparent duplication of entities, we have here a distinction between two relations among expressions, namely, equivalence and L-equivalence, and, based upon it, a distinction between two relations between expressions and entities, namely, designation and L-designation. We have seen that it is possible to construct in M' contextual definitions for the non-neutral terms 'class', 'property', etc., which lead to formulations like those in M . This result shows, on the one hand, that the neutral method in M' does indeed preserve all distinctions originally made in M and hence is an effective substitute for the original form of the method. On the other hand, the result is a justification for M , since it shows that the apparent duplication of entities in M is, in fact, only a duplication of modes of speech. (1988a [1947], p. 167-168).

Carnap (1947) explains that Quine, like Frege, realizes that in non-

extensional contexts names do not refer in an ordinary way. But Quine, unlike Frege, does not claim that a name refers to anything other than an ordinary entity, but that in non-extensional contexts the name does not refer, or rather, it does not designate an entity. Though Quine avoids the use of quantification in contexts in which failures occur in the application of the “principle of permutability *salva veritate*”, thus avoiding the “antinomy of the nominal relation”, as Carnap calls it, Quine’s theory, according to Carnap, undesirably restricts the use of quantified variables in intensional contexts, such as those present in systems of modal logic. Carnap disagrees with Quine on the impossibility of quantification in modal contexts, that is, on the impossibility of connecting with a quantifier a variable present in such a context. According to Carnap, if one considers that an expression has both an extension and an intension, then it is not necessary to restrict the use of quantification in intensional contexts, particularly in modal contexts. However, it is important to note that, although Carnap disagrees with Quine on the possibility of using quantification in such contexts, Carnap insists that it is essential for the development of modal logic to respond to the objections raised by Quine.

In letters from October 1945 and January 1946, Quine admits, in turn, that Carnap, in his manuscript entitled “Extension and Intension”—to be published under the title *Meaning and Necessity* in 1947—developed a convincing means of conciliating modal logic with quantification. Even so, Quine sees in this conciliation some serious inconveniences. According to Quine, the variables in a modal language only have intensions as values, and therefore the extensional values of variables disappear in these contexts. Against this view, Carnap argues in *Meaning and Necessity* that it is erroneous to say that because the values of variables in modal contexts designate intensions, the extensions disappear from the universe of language. According to Carnap, it is not possible for an expression—be it a name or a predicate—to have only an extension, and not an intension, or vice versa. Carnap argues that in the transition from an extensional language to a modal language, extensional entities—such as individuals and classes—do not simply *disappear* (1988a [1947], p. 200). In both, an extensional and an intensional language, every designator—individual symbol, predicate, or sentence—has both intension and extension. When we speak, in a modal language, about the intension of a designator, it maintains its extension.

3.2. A Criterion for Intensional Meaning

In *Semantics and Abstract Objects* (1951c), Quine explicitly states that he does not defend the total elimination of reference to abstract objects in linguistic systems. Although he continues to sustain that “sense” (*Sinn*) is an

“obscure intermediate entity” that needs to be discarded, the admission of other abstract entities, such as classes, is essential—for example, in the case of mathematics. However, classes are only admitted by Quine because the discourse related to them is extensional, and the principle of permutability *salva veritate* can be applied to this discourse. Classes are extensions of predicates, and can be logically treated as such.

In 1950, both Carnap and Quine took a tolerant stance on abstract entities. However, Carnap’s approach was different from Quine’s in that he affirmed that, on the one hand, the admission of a discourse concerning abstract entities does not automatically entail the acceptance of a “platonic ontology” and, on the other hand, that the tolerance of this should be extended to intensional abstract entities. For his part, Quine avoided discourse concerning intensions until his later writings.

Be that as it may, the fundamental difference of opinion between Carnap and Quine is related to the possibility of putting forward satisfactory criteria of identity for intensional abstract entities. According to Carnap, first of all, the acceptance of a linguistic system of reference (a linguistic framework) does not imply the ontological reality of the referred entities (1988d [1950]). Questions on the existence of certain entities inside the framework are answered according to *identity criteria* present inside the framework. For Carnap, if questions concerning intensions within a system of reference—following the introduction of “linguistic forms” which refer to these intensions, as in the semantic systems of *Meaning and Necessity*—are to be resolved logically (whereas in other systems they may be resolved empirically), then there is no reason to reject reference to such entities. The question of whether to accept references to certain kinds of entities referred to by linguistic expressions inside a framework, whether abstract or not, could also be ‘external’ to the *framework* and depend on pragmatic considerations about efficiency, productivity and simplicity of the whole system of reference. But in any case, questions of reference wouldn’t be ontological questions and speaking about certain entities wouldn’t compromise the speakers with the ontological reality of these entities.

The problem is that when Quine rejects the distinction between analytic and synthetic sentences (as he does, for example, in *Two Dogmas of Empiricism*, 1951a), he simultaneously rejects the possibility of deciding—but only for reasons of logical order—the truth-value of isolated singular sentences, including those of logical-semantic systems. For Quine, therefore, to give an example, it is not sufficient to assert that sentences about the identity of intensional objects can be analytically true when the terms refer to the same intensional object, as he thinks that there are non-satisfactory criteria for the

identification of the truth-value of analytical sentences.

In reply to Quine's criticism of a philosophical explanatory discourse on intensional objects, Carnap (1988c [1955]) offered *Meaning and Synonymy in Natural Languages*. In this paper, Carnap attempts to demonstrate how a linguist can formulate empirical criteria for the identification of the intensions of linguistic expressions.⁶ Carnap affirms that it is possible to determine, by means of behaviourist criteria, both the extensions and intensions of linguistic expressions. Against Quine's assertion that intensional concepts of "pure semantics"—such as synonymy and analyticity—cannot be applied to natural languages, he proposes a "behaviourist-operational procedure" for the use of the concept of intension in language analysis. This procedure is a *pragmatic justification* of the usage of intensional concepts and, by identifying an operational procedure for the concept of intension, the other intensional concepts that are derived from it would be also justified.

Carnap sustains that the notion of intension may be justified empirically with a degree of scientism that is similar to that of the notion of extension. A linguist may delimit the extension of a predicate which, for example, denotes observable objects, by observing the verbal behaviour of speakers of a particular language in determined situations. In other words, the linguist may observe whether these speakers apply the predicate to some objects but not to others.⁷

In his attempt to facilitate the determination of intensions through the observation of linguistic behaviour, Carnap formulates a definition of intension for predicates, based on the idea that the intension of any predicate is the "general condition" that an object must satisfy in order for a predicate to be attributed to it. This "general condition" concerns the "properties" an object must have for predication to take place. On the basis of these premises, Carnap formulates the following behaviourist criterion for determining the intension of a predicate:

[T]he intension of a predicate 'Q' for a speaker *X* is the general condition which an object *y* must fulfil in order for *X* to be willing to ascribe the predicate 'Q' to *y*. (We omit, for simplicity, the reference to a time *t*.) Let us try to make this general characterization more explicit. That *X* is able to use a language *L* means that *X* has a certain system of interconnected dispositions for certain linguistic responses. That a predicate 'Q' in a language *L* has the property *F* as its intension for *X*, means that among the dispositions of *X* constituting the

⁶ According to Dirk Koppelberg (1987), Quine's example of radical translation is a response to the hypothetical thought-experiment proposed by Carnap in 1955.

⁷ It seems obvious that this remark is not as simple or objective as Carnap believes. In this case, we should refer to Quine's analysis of radical translation to be able to understand the extent of the problems involved in analysing an unknown language.

language L there is the disposition of ascribing the predicate 'Q' to any object y if and only if y has the property F . (F is here always assumed to be an observable property, i.e., either directly observable or explicitly definable in terms of directly observable properties.) (1988c [1955], p. 42).

By means of this definition, Carnap intends to justify the use of a language of intensions in semantics, as in the case of the formal semantics of *Meaning and Necessity* (1988a [1947]). For example, a word such as “blue” has the following characteristics:

- a) A component of designative meaning that corresponds to those properties to which the word refers, and which establishes the conditions for the application of the word to objects.
- b) An extension that corresponds to the sum of the objects denoted by the word. According to Carnap, if we wish to know whether the word denotes a certain object, we need to understand it and know its intension, i.e. know what conditions the object must satisfy in order to be denoted by the word in question.

Carnap's empirical procedure is based on observations of linguistic behaviour that allow the linguist to determine the intension of a predicate.⁸ The procedure consists—as in the case of verifying the extension of a predicate—not only in questioning speakers about real cases to which it may apply, but also in questioning them about possible cases for its application. As with the determination of extensions, this makes it possible to define the group of objects that are denoted by the predicates, or rather, that are within their scope. Since, based on this scope, one can *infer* a spectrum of additional qualities or properties that are part of the intension of the predicate, the exact limits of which properties can be considered part of the intension and which not remains open. Carnap claims that, in addition to a certain degree of “extensional vagueness”, there is likewise a certain degree of “intensional vagueness”. This vagueness manifests itself in the procedure for the empirical determination of intensions, at those times when speakers are disposed neither to confirm or refute the attribution of a predicate to an object.

The “degree of vagueness” of a predicate becomes evident in those sentences where it is attributed to certain objects and which are neither affirmed nor denied by speakers. However, because of the empirical character of the method of determination of intensions, neither the extension nor the degree of vagueness can be determined absolutely, since:

⁸ The term “intension” here refers to the cognitive component of meaning.

- a) Speakers may not clearly understand the questions posed by the linguist, or it may not be clear which facts they are observing.
- b) The empirical method of observing whether speakers affirm or deny specific sentences is limited by the impossibility of observing a speaker's linguistic behaviour in regard to all sentences of a language, i.e., it is limited by its inductive nature.

Despite this formulation of a behaviourist method for the determination of the intensions of predicates—which could be also applied in determining the intensions of other linguistic expressions—, Quine persists in his opinion that we lack criteria for identifying intensions. This shows that he considers Carnap's criterion unsatisfactory, even though he never published a more systematic review of Carnap's paper *Meaning and Synonymy in Natural Languages*.

Summary

In addition to the historical developments of semantics—which influenced Carnap—there are two fundamental reasons for Carnap's increasing tolerance towards intensional terminology and analysis in philosophy of language. In the first place, Carnap finds it possible to maintain a discourse on intensions without this leading to an *ontological commitment to abstract intensional entities*. Second, the behaviourist criteria for the identification of intensions that he offered demonstrates that he believed it possible to meet clear identification criteria for intensions. In these two points, therefore, Carnap disagrees, in his semantic period, with Quine. Thus we could say that even if Carnap were concerned with maintaining an ontological austerity attached to the empiricist stance that relies on empirical extensions as observable and a reliable basis for clear and true scientific discourse, he considers a pragmatic and conventionalist way of accepting intensional vocabulary in scientific discourse: 1. Avoiding the metaphysical commitment with the possible *nominata* of intensional expressions and 2. Showing how to establish empirical criteria for the use of these intensional expressions.

In a paper written in honour of Carnap, Quine reports that in the late 1930s, in the face of Quine's critique of his *flirtations* with intensional logic, Carnap replied:

I do not indulge in this vice generally and thoroughly. [...] Although we do not like to apply intensional languages, nevertheless I think we cannot help analysing them. What would you think of an entomologist who refuses to investigate fleas and lice because he dislikes them? (QUINE, 1966, p. 43).

However, Quine not only *dislikes* intensions. The important and varied

outcomes of his criticism of intensional vocabulary show that his scrutiny should be taken seriously, as it were, even by Carnap. This criticism proved to be as important as Carnap's tolerant view of the twentieth-century developments of logic, semantics, and philosophy of mind.

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