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Are Quine's criteria of adequacy for individuations unduly restrictive?

Resumen: *Un importante principio que guía la ontología de Quine consiste en el rechazo de 'las entidades sin identidad'. Es empleado por él para rechazar las entidades intensionales y meramente posibles. Empero, Quine jamás ha explicitado cuáles son los criterios que una clase dada de entidades debe satisfacer para contar como 'bien individuada' según su sentido. Los criterios son reconstruidos en la sección 1 de este artículo. La sección 2 pretende mostrar que esos criterios son indebidamente restrictivos: implican que inclusive las entidades del propio sistema ontológico de Quine carecen de identidad. En la sección 3 se argumenta en favor de que los prospectos de construir un patrón menos restrictivo son obscuros. De lo anterior se infiere que la distinción de Quine entre entidades con identidad y entidades sin ella es ociosa. Es una distinción sin diferencia y debe, por lo tanto, ser rechazada.*

Palabras clave: *Quine. Principio de individuación. Identidad. Predicado de clase. Extensionalismo.*

Abstract: *An important principle guiding Quine's ontology consists in the rejection of 'entities without identity'. It is used by him to reject intensional and merely possible entities. But Quine has never made explicit what the criteria are that a given sort of entities must meet in order to count as 'well-individuated' in his sense. In section 1 of this paper, these criteria are reconstructed. Section 2 aims to show that these criteria are unduly restrictive: they imply that even the entities of Quine's own ontological system lack identity. In section 3, it is argued that the prospects of constructing a less restrictive standard are dim. From this the conclusion is drawn that Quine's distinction between entities with and without identity is idle. It is a distinction without a difference and must hence be rejected.*

Keywords: *Quine. Principle of individuation. Identity. Sortal predicate. Extensionalism.*

0. Introduction

For Quine, the primary task of ontology is to answer the question of which sorts of entities really exist. To do this in a systematic and non-arbitrary way, we need methodological rules telling us under what conditions the ontological recognition of a given sort of entities is legitimate. Quine's most important contribution to ontology consists in providing some such rules. His 'methodology of ontology' consists mainly of four principles: first, the principle of ontological economy, which says that we must reject entities that are not really needed to construct the theories we accept (cf. Quine, 1964, 212); second, the principle of ontological commitment, according to which we must recognize the entities that are presupposed by the truth of our theories (cf. Quine, 1948); third, the principle of naturalism, according to which 'it is within science itself, and not in some prior philosophy, that reality is to be identified and described' (Quine, 1981a, 21); and fourth, the principle that 'there is no entity without identity' (Quine 1981b, 102).[1] The latter we may call the 'principle of

well-individuatedness'. It says, roughly speaking, that we must reject entities whose identity is 'ill-defined'. This principle is used by Quine mainly to defend his extensionalism, that is, the rejection of intensional entities like properties and propositions and of *possibilia* like the possible fat man in that doorway (cf. Quine 1948, 4, and Quine, 1981b, 100).

However, Quine has never explained in a clear and succinct way what exactly the criteria are that a given sort of entities has to satisfy in order to count as well-individuated in his sense. In section 1 of this paper, these criteria are reconstructed. Section 2 aims to show that they are unduly restrictive. It is argued that, given Quine's standard, no sort of entities is well-individuated, including physical objects and sets, which are considered by him to be the paradigms of well-individuated entities. In section 3, a more liberal, holistic standard is defended, according to which the basic units of individuation are whole ontological systems of entities, and not individual sorts of entities. To individuate such a system satisfactorily, the sorts of entities contained in it must be individuated in a mutual way. But, on this standard, the intensional systems of entities are well-individuated, too. From this the conclusion is drawn that the distinction envisaged by Quine between entities with and without identity is illusory. It must be rejected because there are no criteria defining a clear boundary between entities with and without identity.[2]

1. Quine's criteria of adequacy for individuations

The slogan 'There is no entity without identity' has both an epistemological, an ontological and a semantical reading. On the epistemological reading, the principle says that we must reject a given sort of entities when we do not dispose of an algorithm that allows us to decide in every case whether two entities of this sort are identical. Take the cardinal numbers, for instance. We do not know whether the cardinality of the power set of the integers is identical to the cardinality of the real numbers. The independence of the continuum

hypothesis from Zermelo-Fraenkel set theory implies that we do not have any method to decide this effectively. Hence, there are numbers without identity in the epistemological sense that they are indistinguishable by the methods that we have currently at our hands. Since Quine accepts the cardinal numbers in his ontology, it is clear that his principle of well-individuatedness must not be read as an epistemological restriction.

On the ontological reading, the slogan says that there are no entities whose identity is not determined by the totality of the facts. We may admit, for instance, that we do not have any method to decide whether the cardinality of the power set of the integers is identical to the cardinality of the real numbers. Nevertheless, we may still assume that there are mathematical facts determining whether these numbers are identical or not. In this case, the numbers are, ontologically, entities with identity.

If French and Krause are right, then the particles of quantum mechanics are entities without identity in the ontological sense. The physical facts do not determine which particle is identical to which particle at different times. These particles are therefore 'non-individuals' in the sense that they lack self-identity, that is, the notions of identity and distinctness are not applicable to them. From this French and Krause conclude that Quine's claim is wrong that there are no entities without identity.[3]

It is, however, questionable that the ontological reading accords with Quine's intentions. Quine does not reject intensional entities because they suffer from a lack of facts determining their identity, but because their identity is not 'well-defined'. This is a semantical problem and not an ontological one, as we shall see.

Finally, on the semantical reading, the slogan says that we must reject entities whose identity is not well-defined. To define the identity of numbers, for instance, we must explain what the conditions are for two numbers to be identical. We may be epistemically unable to decide, in a given case, whether two numbers really satisfy these conditions. Nevertheless, these conditions must be clearly defined. To achieve this, is the proper task of a definition of the identity of numbers. Thus, Hume's principle of individuation for numbers,

The number of the Fs=the number of the Gs
if and only if there is a bijective function
mapping the Fs onto the Gs,

explains what the identity conditions of the numbers are. Without such a principle, identity statements of the form 'The number of the Fs=the number of the Gs' would lack clear truth conditions and therefore also a clear meaning.

Prima facie, to define the identity of a given entity, we must formulate an open sentence that is uniquely satisfied by it. Since, for instance, the open sentence 'x is the author of *Word and Object*' is uniquely satisfied by Quine, this sentence can be used to explain what the conditions are to be identical to Quine. The slogan 'There is no entity without identity' might accordingly be read as saying that it is legitimate to recognize a given sort of entities only when we are able to specify each entity of this sort by formulating an open sentence that is uniquely satisfied by it. To individuate the numbers, we must, in this case, not only explain what the conditions are for two numbers to be identical, but also what the conditions are for a number to be identical with any entity of any other sort. That is, we must not only explain the truth conditions of identity statements of the form 'The number of the Fs=the number of the Gs', but also the truth conditions of identity statements like 'The number 2=Julius Caesar'.

The latter problem concerns the identity of entities of different sorts and is frequently called 'Frege's Julius Caesar problem'. It is not part of the problem of individuating the numbers in Quine's sense.[4] We must distinguish between the individuation and the specification of entities (cf. Quine, 1981b, 101). To specify an entity, we must formulate an open sentence with one free variable in it that is satisfied by this entity and only by it. Thus, to specify the number 2, we must not only decide whether it is identical to the number 1+1, but also whether it is identical to Julius Caesar or to any object of any other sort. The corresponding open sentence defines the number 2 in the classical sense of distinguishing it from any other object. An individuation of the numbers, on the other hand, does not define each number, but the notion of their identity.

The demand for an individuation of a given sort of entities arises because the corresponding sortal predicate is intelligible only insofar as its reference has been 'divided' in a satisfactory way. To learn the semantics of the mass term 'water', it is sufficient to learn the truth conditions of 'This is water'. But, to learn the semantics of a sortal predicate like 'apple', it does not suffice to learn the truth conditions of 'This is an apple'; it is also necessary to learn the truth conditions of sentences like 'This apple is different from that one' and 'These are two apples'. The difference is that the sortal predicate 'divides' its reference. We can count apples, but not 'waters' (cf. Quine, 1973, §15, §23).

On the semantical reading, the slogan 'There is no entity without identity' accordingly says that it is not legitimate to accept a given sort of entities when the division of reference of the corresponding sortal predicate has not been satisfactorily explained. The point of this principle is that the acceptance of a sort of entities does not make any sense as long as we do not know what the corresponding sortal predicate is supposed to mean (cf. Quine, 1958, 19). We do not even know what sort of entities we accept as long as their identity is ill-defined.

Let us now reconstruct Quine's criteria of adequacy for such definitions or 'principles of individuation'. There are mainly two reasons why he rejects a given principle of individuation. The first is its material inadequacy. Thus, the individuation of properties by the principle

The property of being an F=the property of being a G iff for all x: F(x) iff G(x), is materially inadequate because coextensive properties may not be identical (cf. Quine, 1963, 2). The second reason to reject a given principle of individuation is its circularity. An obvious example of a circular principle, not discussed by Quine, is the individuation of linguistic meanings by the principle

The meaning of term A=the meaning of term B iff A and B are synonymous.

Since synonymy is the identity of meaning, this principle amounts to the tautological principle that the meanings of two terms are identical when they are identical. The circularity of the principles criticized by Quine is less obvious. Thus, Davidson's individuation of events by the principle

> Events are identical iff they cause and are caused by all and only the same events,

is circular, for Quine, because it 'already presupposes a grasp of the notion of event, quantifying as it does over events in an essential way' (cf. Quine, 1981c, 236, and Quine, 1985, 166). Technically speaking, the problem is that this individuation is *impredicative*: it quantifies over the entities whose conditions of identity are to be explained. This becomes obvious when we reformulate it in the language of first-order predicate logic:

> For all events x, y: x=y iff for all events z (x causes z iff y causes z, and z is caused by x iff z is caused by y).

Note that Davidson's principle amounts to an explicit definition of the identity of events that allows us even to eliminate the identity sign. Hence, it is not circular in the classical sense that the *definiendum* occurs in the *definiens*. Rather, the problem is that the variables occurring in the *definiens* refer to the entities that are to be individuated.

Contrary to Russell and many other authors, Quine accepts impredicative definitions. Nevertheless, he rejects Davidson's principle. The reason is that we must distinguish between the individuation of a given sort of entities and the definition of their identity, because they have different criteria of adequacy: only impredicative definitions, and not also impredicative individuations, are legitimate, in Quine's view (cf. Quine, 1985, 166).

His reason to reject impredicative individuations is that a sortal predicate is not intelligible as long as its division of reference has not been successfully explained. The division of its reference is an integral part of its semantics. It is hence viciously circular when we presuppose the intelligibility of the predicate in our explication of the division of its reference. In particular, we must not presuppose that it makes any sense to count the corresponding entities. However, by quantifying over them, we are presupposing that we already know how to count them, and hence, that the division of reference of the corresponding sortal predicate has already been satisfactorily

explained. To avoid circularity, we must therefore explain the identity conditions of entities without quantifying over them. This means that we must reject impredicative individuations.

> The individuation of attributes by the principle

> The attribute of being an x such that F(x)=the attribute of being an x such that G(x) iff it is analytically (or necessarily) true that for all x: F(x) iff G(x),

is not impredicative. Nevertheless, it is also considered to be circular by Quine in the sense that it assumes prior intelligibility of the notion of analyticity (necessity). The problem is that it explains the identity conditions of attributes in terms of a notion whose intelligibility is questionable, too. The same applies to the principle

> Two attributes are identical iff they are members of exactly the same sets,

which assumes prior intelligibility of the notion of a set. To individuate the attributes in a noncircular way, we must explain the conditions of their identity without employing any concepts which, on their part, are also in need of a satisfactory explication (cf. Quine, 1981b, 104-105).

Zalta's individuation of abstract (i.e. Meinongian) objects, which is not discussed by Quine, is a second example of this broader kind of circularity:

> Two abstract objects are identical iff they necessarily encode the same properties. (cf. Zalta, 1999, 6)

Considered as a definition of the identity of abstract objects, this principle is perfectly acceptable, because it allows us to eliminate the identity sign, again. Nevertheless, considered as a principle of individuation, it is viciously circular as long as the problematic notion of a property has not been provided with a satisfactory principle of individuation, too.[5] Zalta does

also give a definition of the identity of properties, which reads:

> Two properties are identical iff they are necessarily encoded by the same abstract objects. (Zalta, 1999, 6)[6]

This individuation presupposes that we already know what the identity conditions of abstract objects are supposed to be. Taken together, the two principles explain the identity conditions of properties and the identity conditions of abstract objects in a *mutual* way. On Quine's standard, this procedure is also viciously circular, because we cannot satisfactorily explain two unclear notions by explaining one in terms of the other, and *vice versa*.

Quine's paradigm of a successful individuation is the following explanation of the identity of sets:

> [W]hen we ask for a relation of sentences that will individuate attributes, we must require that the relation be expressed without mention of attributes. The notion of attribute is intelligible only insofar as we already know its principle of individuation. Observe, in contrast, how well the corresponding requirement is met in the individuation of classes. I began by saying that classes are identical when their members are identical; but what we now want is a satisfactory formulation between two open sentences 'Fx' and 'Gx' which holds if and only if 'Fx' and 'Gx' determine the same class. The desired formulation is of course immediate: it is simply '(x) (Fx=Gx)'. It does not talk of classes; it does not use class abstraction or epsilon, and it does not presuppose classes as values of variables. It is as pure as the driven snow. Classes, whatever their foibles, are the very model of individuation on this approach. (Quine, 1981b, 105)

The idea here is to explain the truth conditions of 'the set of the Fs=the set of the Gs' in terms of the completely innocent phrase '(x) (Fx=Gx)'. The latter does not quantify over sets ('talk of classes'), nor does it use the notion of membership ('epsilon') or other notions whose intelligibility is questionable. Hence, this individuation is neither circular in the sense that it is impredicative nor in the sense that it presupposes an explication of the notions used to explain the identity conditions of the entities in question.

2. The inadequacy of Quine's criteria of adequacy

The ontological system accepted by Quine consists basically of two sorts of objects: physical objects and sets. It can be shown that, in his system, both the identity of physical objects and the identity of sets are 'ill-defined', given his own standard. Moreover, his criteria of adequacy for individuations imply that there is no sort of entities at all whose identity is 'well-defined'. From this it follows that they are unduly restrictive. The principle of well-individuatedness would imply that we must reject the ontological recognition of any sort of entities.

For Quine, the primary objects of ontology are the objects in relation to which we learn the reference of our first terms. Examples are desks, cats, and persons. These objects are called 'physical bodies' by him. In accordance with his naturalism, he considers this sort of entities as the objects *par excellence* that constitute the obligatory starting point of any extension and any sophistication of our ontology (cf. Quine, 1973, §14, §15, §34, §35).

However, since the spatial and temporal boundaries of physical bodies are vague, their identity is not well-defined. To overcome this problem, Quine replaces physical bodies in his ontological system by so-called 'physical objects', which are to be considered as the material contents of any space-time regions. Physical objects are thus spatially and temporally extended entities like events. Their principle of individuation reads:

> Two physical objects are identical iff they are co-extensive (cf. Quine, 1981b, 101).

Obviously, this principle reduces the identity conditions of physical objects to the identity conditions of space-time regions: two physical

objects are identical iff the space-time regions they occupy are identical. The principle of individuation for the latter entities is:

> Two space-time regions are identical when they contain exactly the same space-time points.

Two space-time points are identical in turn iff their four-dimensional coordinates in an appropriate Cartesian system are identical. Since such coordinates are quadruples of real numbers, each of which is identical to a complex pure set, we can finally reduce the identity conditions of physical objects to the identity conditions of pure sets (cf. Quine, 1981a, 17-18). This reduction seems to be a big success, considering that the identity conditions of sets are completely transparent. They are standardly explained by the axiom of extensionality:

> Two sets are identical when their members are identical.

However, given Quine's criterion of non-circularity, this individuation is circular, because the axiom of extensionality is impredicative, in pure set theory. It says:

> Two sets are identical when they have exactly the *same sets* as members.

The problem is that the *explicans* quantifies over sets. Quine recognizes this problem insofar as he concedes that the axiom does not individuate sets 'to perfection', but only 'to the degree that their members are individuated' (cf. Quine, 1981b, 102, and Quine, 1985, 166). To solve this problem, he individuates sets recursively in a set theory with physical objects as *urelements*.[7] The objects forming the basis of the recursive individuation of sets are the physical objects. They are the ground elements that provide any set at any level with clear identity conditions. The objects of second level are sets of physical objects. They are individuated by the principle

> If x and y are sets of physical objects, then x=y iff for all physical objects z: z is a member of x iff z is a member y,

which reduces the identity conditions of sets of physical objects to the identity conditions of physical objects. Similarly, the objects of third level are individuated by the principle

> If x and y are sets whose members are physical objects and/or sets of physical objects, then x=y iff for all physical objects and sets of physical objects z: z is a member of x iff z is a member of y,

and so on. The point of this recursive approach is to reduce the identity conditions of all sets step by step to the identity conditions of physical objects.

However, on Quine's standard, the recursive individuation of sets is circular as well, for two reasons. First, it uses the notion of membership in an essential way, which is a notion whose intelligibility is controversial. Second, and more importantly, the recursive definition is circular in the sense that it reduces the identity conditions of sets to the identity conditions of a sort of objects whose identity conditions have in turn been reduced to the identity conditions of sets. This means that, in Quine's system, sets and physical objects are individuated in a mutual way. And just as the mutual individuation of properties and Meinongian objects in Zalta's system is circular, so too the mutual individuation of physical objects and sets in Quine's system is circular.

3. The holistic alternative and its problems

To individuate the entities of an ontological system in a non-circular way, we need a special sort of fundamental entities whose identity conditions are clear without reducing them to the identity conditions of another sort of entities. These 'ground elements' must have clear identity conditions on their own. They are the ontological counterpart of the 'self-evident claims' postulated in foundationalist epistemology, which are claims that are justified without any justification. Our problem is that there is no sort of entities that may play the role of the ground elements in a system of well-individuated entities. As we have

seen, neither sets nor physical objects enjoy clear identity conditions already from the start. We need abstract objects like space-time regions, space-time points and sets to explain satisfactorily the identity conditions of physical objects, and we need conversely physical objects to explain satisfactorily the identity conditions of these abstract objects.

To resolve this quandary, we must give up the criterion of non-circularity and allow individuating entities in a mutual way. We may thus individuate sets in terms of physical objects and *vice versa*. The idea is to clarify the identity conditions of both sorts of entities *simultaneously*, without presupposing that the identity conditions of one of them have previously been clarified. In this holistic model, there is no sort of entities constituting the basis of individuation, just as in the holistic model of justification, there are no claims constituting the basis of justification. The characteristic of both models is that the circularity involved in the mutual justification of claims and in the mutual individuation of entities is not considered to be vicious, but fruitful.[8]

However, from the holistic point of view, the distinction between entities with and without identity does not really make sense. The holistic approach implies that the basic units of individuation are not singular sorts of entities, but whole ontological systems that include various different sorts of entities. We may say that such a system is well-individuated if and only if all sorts of entities that it contains have been individuated in a mutual and holistic way. Thus, Quine's physicalist system of physical objects, space-time regions, sets, etc. is well-individuated because his individuations achieve a satisfactory mutual explanation of all sorts of entities that are contained in it. But, by the same token, Zalta's possibilist system of entities is well-individuated, because all sorts of entities contained in it are equally well individuated in a mutual way. There is thus no substantial difference between these systems with regard to the explanation of the identity conditions of their members.

Properly speaking, an individual sort of entities can be said to be well-individuated only in the derivative sense that it belongs to a well-individuated system of various sorts of entities. As a consequence,

we must relativize the notion of a well-individuated sort of entities to systems. Thus, we can say that properties are well-individuated relative to Zalta's possibilist system and that sets are well-individuated relative to Quine's physicalist system. But it does not make sense to say that sets are well-individuated in an absolute sense. Just as we need problematic notions to explain the identity conditions of properties, so too we need problematic notions to explain the identity conditions of sets. There is no sort of entities that are 'the very model of individuation', and there is no principle of individuation that is 'as pure as the driven snow'.

Quine has famously argued that the holistic conception of empirical confirmation implies that the analytic-synthetic distinction must be given up (cf. Quine, 1951). For analogous reasons, we must conclude, I think, that the distinction between entities with and without identity must be rejected, too. From the holistic point of view, there is no clear difference between entities with and without identity. The slogan 'There is no entity without identity' must accordingly be rejected as meaningless. It is based on a distinction without a difference.

Notes

1. See also Quine, 1981c, 236, and Quine, 1995, 40.
2. The second and the third section are based on Greimann, 2000. I have tried here to formulate both my interpretation and my criticism of Quine's principle of well-individuatedness in a more perspicacious way.
3. See French and Krause, 2006, and also Krause, 2009.
4. For a detailed reconstruction of this problem and its philosophical significance, see Greimann, 2003b.
5. Moreover, this individuation is also impredicative, because the phrase on the right-hand side quantifies over properties. For more details, see Greimann, 2003a.
6. See also Zalta, 1983, 1, 32, and Zalta, 1988, 19.
7. See Quine, 1995, 40-41.
8. For a more detailed comparison of the two models, see Greimann, 2000, 24 ff.

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