MODALITY, RIGID DESIGNATION, AND ATOMISM

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Abstract

I present an analysis of two problems that share the background of Kripke's theory of modalities. First I analyze the problem of such descriptions as 'First fifty years of John's life' (raised by Andrzej Zabłudowski). I argue that an account of their semantics compatible with Kripke's views of modalities semantics requires treating integrity as an essential property of objects, for otherwise one would be forced to accept that descriptions such as above are rigid, which leads to very counterintuitive consequences. I attempt then to show that assuming Leibniz's Law and Kripke's thesis of necessity of identity leads to state that it is not possible that all of the properties be atomic, that what properties one object has does not make implications on the properties of other objects.

Keywords

In this paper I'll try to present an analysis of Kripke's theory of modalities. I'll be particularly interested in such concepts as *rigid designation*, or *necessary property*. I shall discuss two distinct problems, but they are both concerned with the role of spatiotemporal properties and descriptions. The first problem is couched in semantic terms, the second – in metaphysical ones.

I) Kripke's theory: An overview

Quine stated that although 9 is necessarily equal to 9, it is contingently equal to the *number of the planets*. It is thus absurd, according to him, to speak of modal properties of objects: the whether the alleged property is realized is a function of the way the object in question is referred to. At most we may speak then of modal properties of statements. *De re* modalities are thus, according to him, inadmissible.

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[1] Kripke, *Naming and Necessity*, Harvard University Press, Cambridge MA 1980.

Kripke[1] replies that when one suggests a theory of *de re* properties, it is necessary to make difference between rigid and non-rigid designators. He states that actually both

(1)9 (∇=) NrP

and

(2)9(∇=) 9[2]

are true. The appearance of the contrary comes from the very tendency to confound sentential and referential modalities. For while both (1) and (2) are true

(3)∇ (9=NrP)

is not. On the other hand, we may truthfully assert:

(4)∇(9=9)

The difference between modality applied to sentences and the those applied to '=' arises only in cases of statements in which the relata of the identity relation are not referred to by *rigid designators*. A term is a rigid designator *iff* it refers to the same object in whatever possible world it does refer. Kripke states that i.a. names and numerals are rigid designators.

An identity statement, such as

(5)x=y

has

(6)x(∇=)y

as its logical consequence, while does only imply

(7)∇ (x=y)

if both 'x' and 'y' are rigid. Thus *nine is necessarily identical to the number of the planets*, although *it is not necessary that the number of the planets be nine*. Quine's thesis that de re modalities are inconsistent are thus rejected.

II) Zabłudowski's problem
a)The problem

Zabłudowski[3] considers two descriptions:

(J)   'John' (a proper name)

and

(J*) 'First 50 years of John's life'

Let's assume then actually John did live exactly 50 years[4]. In this case we shall state that

(8)J=J*

Thus we obtain

(9)J(∇=)J*

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[2] ∇ is the necessity operator, ◊ is the possibility operator.

[3] Zabłudowski, *unpublished manuscript*

[4] Let's further assume, for convenience of exposition, that he *lives in every possible world and could not have lived shorter*.

'J' is a name, so it is an prototypical example of a rigid designator. Zabludowski claims that J*
is also rigid: nothing could be the very first fifty years of John's life except the first 50 years of his
life. But if we accept such an analysis, we obtain, according to Kripke's principles:

(10) ∇ (J=J*)

(10) is blatantly false, or at least constitutes a strong counterexample to our intuitions. Actually
it states that John *could not have lived longer*. Even if it were to be true, it should be a consequence
of some biological theory, some historical plot of events historical, maybe even astrology - but
surely not *semantics*. If one is to keep Kripke's modal apparatus it is necessary to reject the thesis
that 'J*' is rigid. I will try to show why I find such an analysis plausible.

b) The solution

If J* were to be nonrigid, it would have to refer to different individuals in different possible
worlds. What constitutes a proof that an individual *i1* in the world *w1* is not the same individual as
i2 in the world *w2*? Stating that J* has different properties in every possible world is not enough,
as in each world the happenings are different – *i1* may well be yellow in *w1*, and green in *w2*.
But difference in *essential properties* will surely do. Those are by definition properties that a given
object has in every possible world it exists.

(11) $\forall xy \, \forall P \, \{(i1=i2) \Leftrightarrow [\nabla P(x) \Leftrightarrow \nabla P(y)]\}$

In order to defend Kripke, one should thus point out a necessary property that J* has only in
some of the worlds.

I suggest thus to analyze the property of *being an integral object* (INT). It is evident that in
most of the worlds J* does not have that property – namely in those, in which J lived longer
then 50 years. In such a case, J* denotes only a fragment of a genuine object. The question is,
whether INT is a necessary or a contingent property of persons. In order to solve that problem
let's remark that the end of objects that are not integral happens for reasons which are not
natural. Genuine objects end because of some features of their internal constitution and the
environment they are in: cancer, car accident, etc. In the worlds in which J*≠J, J* comes to an
end because of *semantic properties of the description*.

In order to strengthen the intuitions of INT's essentiality one can point out to the fact that
the way objects disappear, transform into other forms etc. is often decisive to determine their
substance: we can tell substances by verifying the temperature at which they burn, etc.

To summarize: my point is that INT is an essential property of persons, and thus J* is not
a rigid designator. This is because in some worlds J* refers to genuine objects (i.e. John),
and in the others to *fragments*. The beings that J* refer to differ by essential properties,
because they *end* for very *different reasons*.

III) Leibniz's Law, atomicity, and naturalistic metaphysics

As we have seen (formulas 5-6 above), Kripke emphasizes the necessity of identity: every identity
claim is/implies a claim of a necessary identity[5]. No object is allowed to be two objects in any
world.

Another claim he strongly supports is the Leibniz's Law. Let it be formulated as:

(12) a=b $\Leftrightarrow$ $\forall$P[P(a)$\Leftrightarrow$P(b)]

In this form, the formula means that two objects are one iff they share all the properties.

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[5] This is emphasized in Kripke, *Identity and Necessity*, in: Munitz, Identity and Individuation, New York University
Press.

Assuming some other, plausible framework of prerequisites for properties, these two claims have interesting implications for the theory of properties. Namely, they suggest that it is necessary to abandon the assumption that all properties can be atomic.

The intuition of atomicity is the idea that what properties an object has is independent on the properties of other objects. So the size of the desk I use now is independent on the color of my hair. One famous philosophical text that proclaims the thesis of atomicity is of course Wittgenstein's *Tractatus*. He states:

'From the existence or non-existence of one state of affairs it is impossible to infer the existence or non-existence of another'.[6]

In order to discuss the relevance of Kripke's assumptions for the claims of atomicity it is necessary to present some definition of the notion in question. I shall speak of what I shall call *modal atomicity*. First, I shall define *modal independence*:

$$\mathbf{MI}(P, P') \equiv_{df} \forall xy \{(x \neq y) \Rightarrow [(\Diamond Px \land \Diamond P'y) \Rightarrow \Diamond(Px \land Py)]\}$$

So two properties are modally independent if from the facts that it is possible for two objects to have one of each, it is possible to infer that the realization of both in the same world is possible.

Lets us define then the *modal atomicity* (MA) of properties:

$$\mathbf{MA}(P) \equiv_{df} \forall P' \, MI \, (P,P')$$

A property is modally atomic iff if its realization by some object does not preclude the realization of any other property by any other object.

Claiming that all properties are MA may well seem implausible. The world seems to be a complex thing, with objects interrelated in various and unobvious ways. Whatever be one's view on the truth of such a claim, however, it may be interesting to see if it is a *coherent* one; and what is required for it to be so. And there are philosophers who did believe that the world at its basic level is built that way.

I shall assume some general thesis about properties that are required in naturalistic metaphysics. First, I assume that individual essences are unacceptable. It is not the case that objects have necessary properties that belong just to them. The idea of there being atoms is just the idea that there are many objects that share important properties: all electrons (the same things applies to protons, neutrons as long as we assume that they are the basic entities[7]) *share* basic properties. It is tempting to equate those basic properties with the *necessary* ones. It is tempting to say that the charge of a given particle is necessary, while its speed, placement etc. are contingent. Actually, if one is to accept a naturalized version of the possible world ontology, such a move may seem necessary. According to such views, modal properties of objects can hardly be anything *but* its basic physical characteristics. Thus we have:

(13) $\forall x \exists y \{(x \neq y) \land \forall P [\nabla P(x) \Leftrightarrow \nabla P(y)]\}$

Furthermore, we shall assume that the necessary properties of a given object determine what contingent ones it is possible for it to have:

(14) $\forall xy [\forall P (\nabla Px \Leftrightarrow \nabla Py) \Leftrightarrow \forall P'(\Diamond P'x \Leftrightarrow \Diamond P'y)]$

It thus follows that every actual property of an object is a possible property of some other object. If the property in question is a necessary one, it happens on the basis of principle (13), if it is a contingent one – on the basis of principle (13). So every proton (electron, etc.) could have

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[6] Wittgenstein, Tractatus Logico – *Philosophicus* 2.062.

[7] For the sake of exposition, I shall assume that the basic structure of the universe is constituted by those three particles.

any of the properties any other proton has or might have. Which again seems plausible.

On such assumptions it is impossible that all properties be MA. Let's imagine two objects that share necessary properties, and differ just in o1's having, contrary to o2, the property P1. According to the principle (14), it is possible for o2 to have P1. Which in turn implies, according to (13), that there is a world in which the difference disappears, as both have P1. According to the Leibniz's Law, they become the very same object. But this contradicts the principle of necessity of identity.

It seems thus impossible that all properties be modally atomic. It is important to remark that this claim is based on some very general ideas concerning the nature of properties and their relations to objects, not on the observation of the properties that obtain. In our world, there is a class of properties that are actually both contingent and not atomic. Those are *spatiotemporal* properties. They are contingent: given a different set of happenings in the world, another particle could have taken the place of the particle p at some given moment t. But they are not modally atomic: it is impossible that objects share the same space.

The reasoning does not preclude objects from occupying the same places (and, more generally, sharing the contingent properties), as long as they differ in necessary ones. Thus, if we accept the existence of souls, we do not violate this principle by stating that they are located exactly in the area occupied by the body, as long as we are prepared to accept that their basic structure are shared by many individual souls. The naturalist requirements I outlined seem *necessary* for a naturalist ontology, but they are far from being sufficient for it. However, this reasoning does not require the existence of space. It states that whatever be the structure of the world, the atomicity of properties is not allowed to be a general phenomenon.