

HOLISM AND DEPENDENCY AMONG PROPERTIES*

Antonio BLANCO SALGUEIRO

Abstract

I present some distinctions concerning the dependence between properties. Then I apply such distinctions to the analysis of holism, concluding that there are at least three different kinds of holism that are important for semantic purposes.

What is wrong is not making enough distinctions. If only we made all the distinctions that there are, then we should all be as happy as kings. (Kings are notoriously very happy.)

Jerry Fodor

1. Introduction

If we take into account our pre-theoretical intuitions it seems unquestionable that there do exist dependency relations between properties. Thus, for instance, we should say that the property *planet* depends essentially on the property *star*, because the first property may not be instantiated unless the second one is instantiated too¹. The relation between *planet* and *star* would therefore form part of the conditions of individualisation or constitutivity of the first of those properties.

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¹ Though not vice versa. We are then in presence of a case of asymmetrical dependency. In some other cases the dependency is symmetric; for example, in the case of *husband* and *wife*, necessarily if the first property is instantiated, then the second will be instantiated too, and vice versa. In these examples and in the successive ones, I use italics in order to name the properties and relations.

In this paper I intend to explore certain identity conditions of properties, which are to do with different dependency relations between properties. The final objective of such an investigation is to be able to spin a sufficiently thin analytical web, which should allow us to clear up the question of semantic holism. As Fodor and other authors have pointed out, there exists wide consensus among contemporary philosophers in favour of semantic holism, consensus which is not accompanied, in general, by a precise and shared formulation of the holistic doctrine². My wish is to clear up the generic question of holism from the scope of general metaphysics, as a previous step to the adoption of a theoretical position as to its application in the field of semantics. However, in this article I will only cover the first part of this ambitious plan. I will make a series of ontological distinctions as regards the dependency between properties, and only occasionally will I offer comments as to the possible applications in the fields of philosophy of language or philosophy of mind. The result I intend to reach is that there exist at least three different classes of theses which may receive the name of “holist”, which I will name “homo-holism”, “hetero-holism” and “mereologic-holism”. The first two ones have been dealt with lately, in an implicit way, by some important philosophers of the mind who are concerned with the question of semantic holism. The third one seems to correspond better to the intuitions which lie behind the notion of holism, and with the use that is made of it in the philosophy of science.

In a preliminary fashion, I would like to make explicit two commitments I assume without discussion. The first is the conviction that the question of holism must be approached from a metaphysical point of view: as the task of determining the level up to which a property is constituted by its relation to other properties. Epistemological and semantic questions come later, from the point of view of the order of explanation³.

Secondly, my investigation runs parallel to the side of philosophical naturalism. The examples by means of which I will be illustrating the different definitions, thought of from my philosophical armchair, have the modest function of offering an intuitive grasp which will facilitate the comprehension of abstract notions. However it eventually corresponds to effective empirical investigation to determine exactly which properties do exist or are relevant for scientific purposes, and which

² See [3]: 54.

³ In this point I am following Devitt’s dictum: “put metaphysics first” ([2]: 6).

relations of concrete dependency they maintain with each other⁴. It is necessary to take this into account in order to stand the stupor that may be produced by my adoption of the notion of “metaphysical dependency” as primitive in the definitions I am going to present. I will consider that such a dependency consists of a very generic relation, equivalent to the relation of individualising, which appears between any entity and those other entities that make it up, constitute it or determine it essentially as the entity it is⁵.

2. Dependency Relations between Properties

The properties an entity has in an extrinsic or relational way vary in function of the context in which that entity is “embedded”, “anchored” or “situated”, while the ones it possesses in an intrinsic or non-relational way are independent of such a context. A relational property, as its name indicates, depends on the existence of a relation in which there appears that which instances it. Thus, *to have an x weight* is not a property a body has independently of its position in a place where a certain force of gravity predominates, for the weight varies if we transport the object, for instance, from the Earth to the Moon. An intrinsic, non-relational property, however, is maintained over the changes of context. As a contrast with *to have the weight x* we may mention the non-relationality of *to have the mass x*, a property whose instantiation does not depend on the gravitational context.

In what follows the definitions below will be central (R1 and R2)⁶.

⁴ I also follow Devitt here. Thus, for example, economic science must tell us whether the property *to have means of production* is constitutive of the property *capitalist*, while the property *to have a Volvo* is not, even though many capitalists have a Volvo (see [2]: 30).

⁵ Colin McGinn distinguishes four aspects within a statement of individualive dependency: linguistic, epistemic, metaphysical and conceptual. I would like to point out only the metaphysical aspect (which is also the basic one for McGinn). According to McGinn, the fact that *Gs* individualise *Fs* is equivalent to “the essence of *Fs* is (partly) constituted by that of *Gs*” (see [8]: 4).

⁶ I would like to point out the relations of dependency between properties, but intuitive examples suggest that a property may depend on entities different from the properties. Thus, the instantiation of *Fodor’s grandmother’s cat* seems to depend not only on the instantiation of the property *grandmother*, but also on the existence of the individual Fodor. On the other hand, the definitions would have to be refined if we wish to account for the complex properties which depend non-conjunctively on simpler properties (for example, the dependency of *grandmother or aunt* with respect to *grandmother* does not imply that whenever the disjunctive

(R1)

- The property p is *relational with respect to the property q* if and only if for every x , the fact that x instances p (at the moment t) depends metaphysically on the fact that there exists a y different from x (and different from a proper part of x) such that y instances q (in t'). Otherwise, p is *intrinsic* with respect to q .

In this definition we do not get the informal notion of “property that depends on the existence of a relation”. In principle, it allows the fact that a property may be relational with respect to another though there may not exist any kind of relationship between entities x and y which instantiate the respective properties. The most obvious relational properties, however, are constructed from a relationship. For example, from *grandmother* (Granny, Fodor) we can construct the properties *subject whose grandmother is Granny* and *Fodor’s grandmother*. Nevertheless, I consider that the definition has the merit of getting a notion of dependency that is important in some semantic discussions. Though it is not made explicit in definition R1 and though, according to that definition, it is possible for a property to be relational with respect to another though the individuals which instantiate the first are not related with ones that instantiate the second, in most intuitive examples the properties which are relational according to R1 found their relationality on the existence of relationships. Thus, *natural number* finds its “holistic relationality” on the existence of the relation *successor*⁷, *planet* finds its relationality relatively to *star* on the existence of the relation *revolves around*⁸, etc. For that reason, I consider that the qualification of “relational” is not entirely undeserving when it is applied to the properties that fit the definition I have just stated.

An alternative, weaker, way of defining relationality would remove the clause “ x different from y ”, so that we would obtain:

property is instantiated, the second one will be instantiated too. Such refinements are not necessary for the objectives of this article.

⁷ See [7]: 2.

⁸ According to Fodor, “To be a planet is to be a rock (or whatever) that is revolving around a star” ([5]: 12).

(R2)

- p is relational with respect to q if and only if for every x , the fact that x instantiates p (in t) depends metaphysically on the existence of a y (different from a proper part of x) such that y instantiates q (in t').

As it is not indicated that x should be different from y , a property instantiated by one individual could be relational with respect to another property which may possibly instantiate that very individual. Thus, *man* would be relational with respect to *animal* because, necessarily, if a subject instantiates the first property, then it will instantiate the second. According to R1, however, *man* would not be relational with respect to *animal*, for the existence of a world and a period of time such that in that world and at that time there is only one animal and that animal turns out to be a man is (both metaphysically and nomologically) possible.

The notions of relationality that are found in the definitions R1 and R2 will be the central ones for the taxonomic objectives in point 4. It will be useful, however, to complete the discussion of relationality by gathering some other intuitions by means of the following definitions:

(R3)

We may maintain the clause “ x is different from y ”, but remove the clause between brackets: “ x is different from a part of y ”. Definition R1 implies that, though the properties instantiated by a whole may depend metaphysically on the properties instantiated by its parts, the former are non-relational with respect to the latter. Thus, for example, *human body* would not count as relational with respect to *head*. If this does not prove intuitively obvious, the clause can be removed. However, it is common to assume that the properties which are intrinsic to something depend, in many interesting cases, on the (micro-)structure of that something, and that the (micro-)structure consists of certain properties of the parts and of certain relations among the parts. Definition R1 does however permit that certain properties of the parts be relational with respect to the properties of the whole (for example, that something may not instantiate *eye* unless something different will instantiate *organism*).

In order to get the intuitive fact that relational properties depend metaphysically on the existence of relations, a clause may be added which will explicitly indicate that a relation is to exist:

(R4)

- p is relational with respect to q if and only if:
 - i. For every x , the fact that x instances p (in t) depends metaphysically on the fact that there exists a y ⁹ such that y instances q (in t').
 - ii. There exists a relation R such that Rxy (in t'').

Alternatively, we can handle the notion of “relational property with respect to a relation”:

(R5)

- p is relational with respect to the relation r if and only if for every x , the fact that x instances p (in t) depends metaphysically on the fact that there should exist a y different from x (and different from a part of x) such that x is in relation with r and y (in t').

Example: *planet* is relational with respect to *revolves around*.

We can then combine the notions of relationality with respect to a property and with respect to a relation, and state, for example, that the property *planet* is relational with respect to the property *star* and with respect to the relation *revolves around*.

Finally, we can establish the notion of *absolute relationality* (with respect to properties):

(R6)

- The property p is *absolutely relational* if and only if it is relational (R.1 or R.2 or R.3 or R.4) with respect to some property q . Otherwise, p is *absolutely intrinsic*.

It is difficult to conceive absolutely intrinsic properties in this sense, at least if we stick to the properties we handle intuitively. A property like this should be one such that an individual may instantiate it although there may not exist any other individual that instantiates some property, or though neither that individual nor any of its parts may instantiate other properties. If it turns out that there are no absolutely intrinsic properties, this would be an argument in favour of the greater explanatory use of the notion of relationality/intrinsicity of a property with respect to another¹⁰.

⁹ Eventually, we may add the clauses “ y is different from x ” and “ y is different from a part of x ”.

¹⁰The distinction between relational properties with respect to other proper-

3. Homo-relationality and Hetero-relationality

I need to establish a last distinction before passing on to deal with the question of holism. Starting from the definitions of relational dependency between properties I have stated in the point above, I will be dividing the set of relational properties into two sub-sets. The instantiation of a property may depend on the instantiation of a different property, but may also depend on its multiple instantiation (that is, its instantiation by more than one individual). The distinction may be made more precise through the following definitions.

3.1. Hetero-relationality

- The property p is *hetero-relational* with respect to the property q ¹¹ if and only if :
 - i. p is relational with respect to q .
 - ii. p is different from q .

Examples

-*owner of a cat* is hetero-relational (R1) with respect to *cat*.

-*planet* is hetero-relational (R1) with respect to *star*.

-*capitalist* is hetero-relational (R2) with respect to *means of production*.

3.2. Homo-relationality

- A property p is *homo-relational* if and only if it is relational with respect to itself, i.e. if and only if the fact that x instances p (in t) depends metaphysically on the fact that there should exist at least a y different from x (and y different from a part of x), such that y does also instantiate p (in t')¹².

ties and relational properties in absolute terms is necessary for the correct statement of some psychosemantic problems. Thus, in the polemics about “internalism” vs. “externalism”, what is in question is the relationality of the semantic properties of thoughts with respect to certain properties instantiated in the ambient of the organism, or with respect to certain internal characteristics of the organism, and not absolute relationality. To the externalist it may be interesting to show that the property *to be a representation of a cat* is relational with respect to the property *cat*, but it would not be interesting for him to show that it is relational with respect to the property *to be a representation of an animal*. On the contrary, this last point (but not the first) would really suit the interests of some internalists.

¹¹In a trivial way, we can define absolute hetero-relationality: hetero-relationality with respect to some property q .

¹²We will immediately see some examples of homo-relational dependency.

4. Kinds of Holism, Molecularism and Atomism

Armed with the notions and distinctions given above, we can now pass on to examining the question of holism in detail.

4.1. *Homo-holism*

If we start from the notion of homo-relationality, we can conceive holism as extreme homo-relationality, molecularism as moderate homo-relationality and atomism as homo-intrinsicity (non-homo-relationality)¹³.

More in detail, starting from the previous definition of homo-relationality (see 3.2) it is possible to establish a three-fold classification of properties such as the following.

4.1.1.

A property is *homo-holistic* if and only if it is very homo-relational.

Examples: *natural number, member of a society of 1.000.000.000.000 of members, Spanish sentence.*

4.1.2.

A property is *homo-molecular* if and only if it minimally satisfies the definition of homo-relationality: that some **x** should instantiate it depends metaphysically on the fact that some other entity **y** may also instantiate it (perhaps an only **y**, in any case not a high number of other entities).

Examples: *brother or sister, married, member of a society of ten members.*

4.1.3.

A property is *homo-atomic* if and only if it is not homo-relational.

Example: *to be more than 2.20 meters tall & to be Spanish & to have an Italian grand-grand father* (conjunctive property which may possibly be instantiated by only one entity in time t).

A homo-atomic property may be hetero-relational, that is, it may depend on the instantiation of other properties different from it, by the same individual that instantiates the first one or by other different indi-

¹³ This is the starting point of [7].

viduals (both things occur with the property I have just given as an example). Therefore, not every homo-atomic property is hetero-intrinsic.

The semantic problem of homo-holism is established for generic semantic properties, in the most obvious case for the property *means*. The homo-holist would say that the fact that an expression should mean depends on the fact that many other expressions mean. Stated in relation to specific semantic properties such as *means that the cat is on the mat*, homo-holism is clearly implausible, stating that no expression can mean that the cat is on the mat unless many other expressions also do so (See [7]).

4.2. Hetero-holism

In the same way as the definitions in point 4.1 were based on [7], notions based on hetero-relationality are used in some parts of [2]. The notion of relationality used by Devitt seems to correspond to definition R2 I have given above, which consists of the dependency of the instantiation of a property with respect to the instantiation of other different properties by the same individual¹⁴.

Starting from the definition 3.1 (interpreted in the sense of R2) we can again establish a three-fold classification of properties (in this case I will do without the precise definitions, which are obvious).

4.2.1.

Hetero-holism: extreme hetero-relationality.

Example: *owner of a model of each coin of legal currency that exists or has existed.*

4.2.2.

Hetero-molecularism: moderate hetero-relationality.

Example: *owner of a model of each Spanish current coin of legal use.*

4.2.3.

Hetero-atomism: non-hetero-relationality¹⁵.

¹⁴ Devitt states the question in terms of which inferential properties of a sign token are constitutive of its meaning, from the multiple inferential properties the token instantiates.

¹⁵ In point 2 I pointed out, with respect to R6 that there may probably not exist absolutely intrinsic properties. In the same way, probably there may not exist absolutely hetero-intrinsic (or hetero-atomic) properties.

4. 3. *Mereologic Holism*

In the way it has been characterised so far, holism affirms the extreme relationality of some properties. Thus, for example, the property *natural number* is radically homo-relational, if it is essential for natural numbers to instantiate *to have a successor*, for then, necessarily if something instantiates *natural number*, infinite things will instantiate that property. The example also helps us to realise that some interesting questions about homo-holism are only stated for generic properties; then, the generic property *natural number* may be homo-holistic while the more specific property *natural number smaller than one* may be - and most certainly is- homo-atomic. Once it is admitted that there exist homo-holistic properties together with others that are not, and that this happens even with respect to related properties, as is the case of *natural number* and *natural number smaller than one*, we should be specially careful not to swift unconsciously from the plausibility of the holism of some properties to the affirmation of the holism of other properties associated in some way to them.

However, when we talk about “holism” it seems to be intuitive that we make reference to properties which are possessed thanks to belonging to wholes. This is not correctly gathered from the definitions I have so far contemplated. In fact, there are properties that count as atomic for Fodor and Lepore (1992), such that something instantiates them only because of their belonging to a totality (for example, *arm* and, more clearly, *right arm*; also *natural number smaller than one*). These properties would be, according to my classification, hetero-relational (R1). However, they are important in the discussions about holism, for, as etymology suggests, what seems to be important in these discussions is, mainly, the dependency of some properties of parts with respect to the containing wholes which make their instantiation possible.

I will now introduce a form of dependency between properties that has to do with the relation between wholes and parts, and would then deserve the tittle of “holistic”. I will give this type of dependency the name of *mereologicity*.

- A property (of a part) *p* depends mereologically on a property (of a whole) *q* if and only if:
 - i. *p* is relational (R1) with respect to *q*.
 - ii. *x* is part of *y*.

Here again we would have the possibility of distinguishing three theses.

4. 3. 1.

Mereologic Holism: extreme mereologic determination. Any change in the whole changes the property.

Example: *member of a triplet* depends holistically on *triplet*.

4. 3. 2.

Mereological Molecularism: moderate mereological determination. Some changes in the whole change the property, some others do not.

Example: *arm* depends mereologically on *body*.

4. 3. 3.

Mereological Atomism: mereological independence.

Summing up what was said in 4.1, 4.2 and 4.3, we may point out that: 1) “extreme homo-relationality” (homo-holism) allows it in principle that a property may be holistic even though the multiple entities that instantiate it may belong to different wholes or be independent of any whole; 2) the “extreme hetero-relationality” (hetero-holism) allows that a property may be holistic even though the individuals that instantiate it may not belong to a containing whole, or even if there may exist a unique individual that instantiates the property in question; 3) mereological determination allows that a property be holistic even though its conditions of instantiation may not imply its multiple instantiation or the multiple instantiation of the properties in an individual.

There is clear imprecision or vagueness in the definitions of molecular and holistic properties: where is the limit between molecular and holistic properties? In concrete cases of application of the distinction it is possible to be able to find principles that may eliminate this imprecision. In [7], for example, the distinction between homo-molecularism and homo-holism seems to be inspired more in the “control” of the multiple instantiation of a property than in the proliferation of instances. The criterion to distinguish them would therefore be “controlled vs. uncontrolled multiple instantiation”. In the semantic scope, the question of whether it is possible to eliminate the vagueness of the distinction is stated in the following way: is it possible to delimit, according to principles, a reduced scope of expressions on whose meaning the meaning of a given expression will depend (molecularism)? Or, on the contrary, does the meaning of any expression depend metaphysically on all the rest (in the typical case, infinite) of the expressions of the language to which it belongs (holism)? A similar problem appears

both for the case of the distinctions based on homo-relationality, and for the ones based on hetero-relationality or on mereologicity¹⁶.

In some discussions about semantic holism we should distinguish several types of holistic relationality. For instance, in the case of the distinction between homo-relational and mereological holism, it may seem obvious that if one semantic property of an expression depends on the fact that other expressions instantiate that property (generic; in the most general case *to have a meaning*), it follows that all the implied expressions belong to the same whole or linguistic system. However, this is not so when we come to theories that emphasise the constitutive role of interpretation over the meaning of expressions or utterances of others¹⁷. In this case, it may be said that the expressions uttered by a speaker in *t* do not instantiate semantic properties unless expressions that form part of a different linguistic system (the one of the interpreter) should instantiate semantic properties. Then we would have homo-relationality (probably holistic) without mereologicity. This is possibly a reason to relativize the question to the expressions of a language or theory, as Fodor and Lepore sometimes do; we would then wonder about the homo-relationality of properties such as *to be a symbol of L* or *to have a meaning in L*. The case of mereologicity without (extreme) homo-relationality may be illustrated, for the case of the sign systems, by properties which are only mereologically holistic. Let us think for example of the property *proper name*. Surely something would not be a proper name should it not belong to a linguistic system which counted on other categories and certain structural principles; however, the system would not have, in principle, a reason to contain a high number of other proper names (though this happens in familiar natural languages).

A simple example will graphically illustrate what has been said so far. Let us imagine we have a piece of cake, which belongs to a cake cut into different portions. This piece will have intrinsic properties -or invariable ones through different relevant contexts- which do not depend essentially on its belonging to this cake: its size, taste, texture, etc. But

¹⁶ The pro-holism consensus has one of its roots in the Quinean rejection of the analytic/synthetic distinction (see [9]). Once atomism is abandoned, the rejection to the analytic/synthetic distinction seems to advocate us to holism, for we are left without a principle that justifies the inclusion of some inter-signal relations and the exclusion of others, among the constitutive conditions of the meaning of a given expression. This has lead authors such as Fodor to stick to semantic atomism, confronted to the undesirable consequences of holism (see[4], [6] and [7]). For the defence of a molecularist posture see [2].

¹⁷ See [10] for an example.

there are other properties it only instantiates because of its belonging to a whole, for example *to be a fourth of the cake*. This property which depends on the totality (a piece of cake of the same size, taste, texture, etc. which belongs to a bigger or smaller cake would no longer have the property in question) is however, homo-atomic, for it can be the only piece of cake which instantiates (it is metaphysically possible that there should exist only one cake and that it should be cut into only two pieces, one of which instantiates *to be 1/4 of the cake* and the other one which instantiates *to be 3/4 of the cake*). Other properties depending on the whole, such as *to be a portion of the cake* could count as very homo-relational (i.e. homo-holistic).

5. Conclusions

I hope to have contributed to the encouragement towards the following points of view.

1. There exist several classes of ontological theses which illuminate important dependency relations between properties, so that in the applications to the philosophy of language, the philosophy of science or the philosophy of mind, it may prove interesting to examine the question of holism from each of the perspectives the different theses outline.

2. The phenomena to which the different theses point are related. In a great number of cases, whenever phenomena of one class appear, there will appear phenomena of the other classes. Nevertheless, there may be cases in which this does not happen, and we are only in presence of phenomena of one class of holism.

3. The main holistic dependency is the one that intends to gather what I call "mereological holism", though it is possible that some of the other dependency relations may appear without the occurrence of correlative mereological phenomena.

Universidad de Santiago de Compostela, anblasal@usc.es

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