Substitutivity

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Resumen

En este artículo, procuro hacer un examen cuidadoso del principio de sustitutividad, algunas veces llamado 'la ley de Leibniz', o 'el principio leibniciano de identidad de los indiscernibles'. Tras ofrecer una formulación precisa e independiente de estos tres principios, me ocupo de ciertos supuestos contraejemplos al principio de sustitutividad y discuto, por separado, las supuestas fallas que se pueden atribuir a las paradojas de la intensionalidad, las dificultades implícitas en las condiciones de verdad de expresiones modales y los contextos epistémicos. Sostengo que los supuestos contraejemplos a duras penas se ajustan al sentido original que el mismo Leibniz le quiso dar al principio. Además, argumentaré que una versión restringida de la sustitutividad puede ser verdadera y recomiendo que se hagan esfuerzos adicionales para salvar el principio, bajo la convicción de que el rechazo adecuado de los ataques en su contra nos permitiría comprender mejor los planteamientos de Leibniz sobre la identidad.

Palabras clave

Principio de sustitutividad, ley de Leibniz, principio leibniciano de identidad de los indiscernibles, *salva veritate*, intensionalidad, contextos epistémicos, identidad, identidad de conceptos.

Abstract

In this paper, I attempt a careful examination of the principle of substitutivity, sometimes referred to as 'Leibniz' Law', or 'Leibniz' Principle of Identity of the Indiscernibles'. After giving a precise and independent formulation of these three principles, I take issue with several alleged counterexamples to the principle of substitutivity and discuss, separately, the supposed failures of substitutivity attributable to the paradoxes of intensionality; difficulties involving the truth conditions of modal expressions and belief contexts. I contend that the alleged counterexamples hardly account for the meaning Leibniz himself originally ascribed to the principle. Furthermore, I shall argue that a restricted version of Substitutivity may be true, and urge additional attempts to rescue this principle, under the conviction that an appropriate dismissal of the attacks on it, would give us better grounds to understand Leibniz' claims on identity

Key words

The principle of substitutivity, Leibniz, 'Law Leibniz', Principle of Identity of the Indiscernibles, *salva veritate*, intensionality, belief context, identity, concept-identity.

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THE PRINCIPLE OF SUBSTITUTIVITY

In literature on identity, there is a frequent discussion of a principle sometimes referred to as 'Leibniz' Law', 'Leibniz' Principle of Identity of the Indiscernibles' or 'the Principle of Substitutivity'. Such variety of labels suggests that there must be a close relationship among the purported principles so designated. Letting issues of ambiguity aside, it transpires that the three labels just mentioned do not refer to the same concept. Scholars like Ishiguro, for example, have pointed out that the general understanding of 'Leibniz' law' aims to the Principle of Indiscernibility of Identicals, while the Principle of Substitutivity is a principle which defines identity of concepts. The disagreements about what could be the correct way to understand each of the three principles contrast with the almost universal agreement about the falsity of the Principle of Substitutivity. It is my interest in this paper to determine whether the standard arguments against the Principle of Substitutivity do justice to the meaning Leibniz himself originally ascribed to it. To accomplish this task, I shall examine a formulation of the Principle of Substitutivity and I shall try to spell out the arguments that show its falsity. Then I will argue that a restricted version of this Principle is true, and urge additional attempts to salvage it, under the conviction that, if such a project becomes successful, then one would be in a better position to interpret Leibniz' claims on identity.

I

To begin with, it will be useful to see what the three principles alluded to are exactly. Unfortunately, Leibniz did not arrive at a singular and definitive formulation of any of the principles (it is even dubious that he regarded them as strictly different principles), since he discussed the matter in several places. However, there are key features in each of them, which enable us to distinguish a formulation from another. In Leibniz' own words the principles can be stated as follow:

(A) "Those are the same of which one can be substituted for the other without loss of truth, such as triangle and trilateral, quadrangle and quadrilateral."

This is what has been called 'Leibniz' law', or the principle of Indiscernibility of Identicals. It says that If *A* and *B* are identical then everything that is true of *A* is true of *B*, or in a more formal way that: $(A = B) \rightarrow (\varphi)(\varphi A \equiv \varphi B)$.

(B) "Those terms of which one can be substituted for the other without affecting truth are identical."

This corresponds to the Principle of Identity of Indiscernibles. It can be stated by saying that: If everything that is true of *A* is true of *B,* and vice versa, and hence if there is no discernible difference between *A* and *B,* then *A* is identical with *B*: $(\varphi)(\varphi A \equiv \varphi B) \rightarrow (A = B)$.

(C) "Two terms are the *same* if one can be substituted for the other without altering the truth of any statement. If we have A and B and A enters into some true proposition, and the substitutions of B for A wherever it appears, results in a new proposition which is likewise true, and if this can be done for every such proposition, then A and B are said to be the same; and conversely, if A and B are the *same*, they can be substituted for one another as I have said."[1]

This is what is properly called 'the Principle of Substitutivity' or 'the *Salva Veritate* Principle'. Notice that (B) is the converse of (A), and that slightly different formulations of both (A) and (B) can be found in or derived from (C). On the other hand, many have contended that the three formulations are infected by a confusion of use/mention. What can be substituted for one another are words, not things as Leibniz seems to suggest, and what can be true or false are the propositions expressed by the sentences in which those words figure. A more precise formulation of the notions conveyed by (A) through (C) is offered by Richard Cartwright in his essay "Identity and Substitutivity".[2] I will use his formulation for the remaining of the paper:

(D) for all expressions α and β, $\ulcorner \alpha = \beta \urcorner$ expresses a true proposition if and only if, for all sentences *S* and *S′*, if *S′* is like *S* save for containing and occurrence of β where *S* contains an occurrence of α, then *S* expresses a true proposition only if *S′* does also.

but this is just the conjunction of:

[1] The first two formulations come from Leibniz' Logical Papers (pages, 84 and 52), as quoted by Hide Ishiguro in her book: *Leibniz's Philosophy of Logic and Language.* New York, Cornell University Press, 1990. p. 19. The third formulation comes from Richard Cartwright's paper: "Identity and Substitutivity." In: *Identity and Individuation.* Ed., by Milton K. Munitz, NYU Press, 1971.

[2] I agree with Cartwright's main conclusions and my own views are strongly influenced by his arguments. I do not, however, share his evaluation about the success of the counterexamples to the Principle of Substitutivity.

(E) for all expressions α and β, $\ulcorner\alpha = \beta\urcorner$ expresses a true proposition if substitution of β for α is truth preserving

with

(F) for all expressions α and β, $\ulcorner\alpha = \beta\urcorner$ expresses a true proposition only if substitution of β for α is truth preserving.

In recent literature, mostly references to (F) are considered as references to "the Principle of Substitutivity". On the other hand, there appears to be widespread agreement on the charge that (F) is simply false; and the reason to justify such charge is that there are counterexamples to it. The main arguments to this effect come from the paradoxes of intensionality, difficulties involving the truth conditions of modal expressions and failures in belief contexts. In my discussion, I will stick to the standard examples which are already familiar to the reader. Let us tackle one at a time.

It has been argued that while the sentence 'Giorgione was so-called because of his size' (S_1) is true, the sentence 'Barbarelli was so-called because of his size' (S_2) is false, and yet Giorgione = Barbarelli. Therefore, S_1 and S_2 appear to be a pair of sentences that falsify (F). For (F) says that if the proposition '$\alpha = \beta$' is true, then substitution of β for α should be truth preserving. Under the supposition that there is no discussion regarding the truth of '$\alpha = \beta$', and according to (F), we should expect that if S_1 and S_2 only differ in that S_2 contains an occurrence of β, where S_1 contains an occurrence of α, then if S_1 is true, S_2 would be true also, but S_2 seems to be false. Let me spell out the core of this argument.

Since the Principle of Substitutivity, as expressed in (F), contains no restrictions whatsoever it is supposed to cover all occurrences of all expressions. The name 'Giorgione' was attributed to someone because of his size, but the same person was also called 'Barbarelli', so while the proposition 'Barbarelli was called 'Giorgione' because of his size' seems perfectly appropriate, the proposition 'Barbarelli was called 'Barbarelli' because of his size' seems not. It looks like we have a legitimate counterexample to (F).

However, as it has been established by Cartwright, the contention that S_2 is false (on the grounds that there is a property that Giorgione has but Barbarelli lacks) seems to be incoherent. Let us see why. To make his case, the critic of (F) needs to hold that there is some property (let us call it *P*) such that a thing *x* has, just in case the proposition that *x* is so-called because of its size is true. He also seems to hold the following argument:

(1) Giorgione has *P*
(2) Barbarelli lacks *P*
∴ (3) There is a property that Giorgione has and Barbarelli lacks.

But, he cannot object to the conjunction of (1) with the proposition 'Giorgione is called 'Barbarelli'' (4), and from these two propositions we can infer that there is someone called 'Barbarelli' and he has *P*. In view of the definition of *P* above we obtain

(5) There is someone called ‘Barbarelli’ and the proposition that he is so-called because of his size is true.

By all means (5) has to be deemed false, since nobody is called ‘Barbarelli’ because of its size, yet the deduction is completely flawless, it seems after all, that Barbarelli has the property. It is no necessary to deploy additional arguments in order to show that something is wrong with the pair S_1, S_2. If one looks at it from the point of view of ordinary intuitions, one can see that the analysis purports to establish that one thing, which is called with two different names, is not one thing, but two. In other words, the argument contains an attack to a case of self-identity due to the failures of some sentences to assure preservation of truth. We have two names and since one of them picks out a unique property which cannot be picked out by the other name, we are asked to concede that the names are not substitutable *salva veritate*, but no matter how firm the critic should be in his intention nor how willing are we to concede the failure of substitutivity in this case, this will never make that the person referred to with the names ‘Barbarelli’ and ‘Giorgione’ becomes two.

II

(F) is false only if there is a legitimate counterexample to it. (B) entails (F) only if a counterexample to (F) counts as a counterexample to (B); that is, if it succeeds in falsifying both (F) and (B). If my last point is well taken, it would be out of question that the status of the pair S_1 and S_2

as a good candidate for a counterexample to the Principle of Identity is seriously damaged. I believe also that its status as a candidate for a counterexample to the Principle of Substitutivity is endangered, since there are many strategies open to the Leibnizian who wants to make sense of the apparent failures of S_1 and S_2. The most obvious one is to claim that Leibniz' original formulation was restricted to non-intentional contents. Ishiguro argues in this direction, and I find her arguments persuasive.[3] According to her, Leibniz was aware that the intensional context created by the words "by its nature as such" makes the propositions "the triangle by its nature as such has 180 degrees" and "the trilateral by its nature as such has 180 degrees" different propositions. But this does not exhaust the doors out of the problem. For the Leibnizian could also claim that S_1 should be read as 'Giorgione was called 'Giorgione' because of his size' and S_2 as 'Barbarelli was called 'Giorgione' because of his size' in which the substitution of the first appearance of 'Giorgione' by 'Barbarelli' does not originate any problems while certainly seems to capture better the meaning conveyed by the sentences S_1 and S_2. The critic of (F), on the other hand, would not be impressed by this response. The sentences amended, he will contend, constitute a different pair, and so are irrelevant to the claim that the original pair *was* a counterexample to (F). Let us accept for the sake of argument that this contention is correct. Are we forced to count S_1 and S_2 as a counterexample to (B) also? I do not think we are. Let us see if it is possible to find another counterexample which can do the job of falsifying both (F) and (B).

Take the pair of sentences 'the number of planets is greater than 7' *(S_3)* and '9 is greater than 7' *(S_4)*. It is a *fact* of astronomy that the number of planets is 9.[4] Hence, it seems, *prima facie,* that 'the number of planets' is substitutable for '9', *salva veritate,* for all effects that could be interesting to both 'the number of planets' and '9'. But further analysis reveals that the substitution in question cannot be performed. Indeed, while the statement '9 is greater than 7' is a necessary truth, the statement 'the number of planets is greater than 7' is a contingent truth.

[3] The restriction appears in the *Opuscules et fragments inedits de Leibniz.* There Leibniz writes: "*A* ∞ *B* means *A* and *B* are identical, or that one can be substituted for the other everywhere. (That is, if it is not prohibited, as in the case where some term is considered in a certain respect. For example, although triangle and trilateral are identical, yet if one were to say that a triangle by its nature as such, has 180 degrees, one cannot substitute trilateral. For in the term [triangle] there is something material [intensional]". In Hide Ishiguro, *Leibniz's Philosophy of Logic and Language,* New York: Cambridge University Press, 1990. p. 28.

[4] Assuming we can adhere at the inventory generally accepted before the recent revision of the Astronomical Associations in 2006.

Notice that this example is quite different from the previous one. We are not dealing with two names of the same thing any more. Here we have an entity (a collection of countable physical objects) which is numbered by a natural number. The puzzle amounts to determine whether or not the expression 'the number of planets' has the same modal properties as the number '9'. The critic of (F) makes his case in the following way. There is no doubt that whereas it is a necessary truth that 9 is greater than 7, it is only contingently true that the number of planets is greater than 7. Therefore, 9 has a property that the number of the planets lacks; namely, that of being "necessarily greater than 7", after all, the number of planets could have been different, or it could be different as a result of a colossal disaster. So it seems that the number of planets lacks a property 9 has, and that while S_4 expresses a necessary proposition, S_3 expresses a contingent one.

But if the pair S_3 and S_4 is to count as a counterexample to (F), the above line of argumentation requires to be supplemented by the following premises:

(6) S_3 expresses a true proposition if and only if 'the number of planets is greater than 7' expresses a necessary proposition.

(7) S_4 expresses a true proposition if and only if '9 is greater than 7' expresses a necessary proposition,

By conjoining (6) and (7), with (8) '9 is greater than 7' expresses a necessary proposition and (9) 'the number of planets is greater than 7' does not express a necessary proposition, it could be inferred that

(10) S_4 expresses a true proposition, while S_3 expresses a false proposition.

Which is the conclusion the critic of (F) is looking for. I think it is possible to object to this argument on the following grounds. (i) Counting planets is an empirical business. Whatever the final result of counting turns out to be, it seems that the truth conditions of any sentence *S* in which the information regarding the number of the planets is conveyed, has to be determined by experience and has to be considered contingent. (ii) We may agree that (6) is true only if we accept that it has to be understood in modal terms, that is, as a *de re* sentence. But it seems to me, that this is precisely what is at stake. The critic of (F) needs to rule out any interpretation of the pair S_3

and S_4 as *de dicto* sentences. (iii) Numbers, insofar as they are paired with empirical things, are just place-holders. They can be legitimately used to number any set of objects which meet the conditions of being disjoint and discontinuous, but numbers do not have to take on the properties of the objects numbered, and *a fortiori* the set of objects counted does not have to take on the properties of the numbers that inform us of its quantities. To claim that the sets counted have to take on the properties of their numbers is a mistake. So the argument which runs from 6-10 makes this mistake. (iv) The claim that S_3 is false because it does not meet the strong criterion of (6) seems rather bizarre. We can agree that S_3 expresses only a contingent truth, but demand from the critic the same agreement on the empirical truth S_3 is meant to convey. For example, S_3 could be the sentence that expresses a proposition which is true, if and only if it is true that

(11) There is a unique number of planets, and this number is necessarily greater than 7.

Which seems to me the natural way to understand a claim like the one contained by S_3, under the contention that it is the type of empirical claim whose truth value cannot be determined without knowing *which* number is the number of planets. It is obvious that if we understand S_3 in this way we need to agree that it expresses a true proposition, because there is a unique number of planets and this number is necessarily greater than 7.[5] (v) We can point out that numbers attach to the concepts under which objects fall and not to the objects themselves while expressions built with modal operators are not meant to give the properties of concrete things, such as planets. Modal expressions do not apply to concrete things independently of the way they are designated. So a sensible reading of the pair S_3 and S_4 must take into account this sort of restriction.

III

Another source of arguments for the critic of (F) comes from belief contexts.[6] Luis might know that '9 is greater than 7' expresses a true

[5] Of course, there also ways open to the critic of (F). He may point out that (i) (F) was not restricted to the *de dicto* readings, and (ii) that while S4 yields a true proposition under any reading (*de dicto* or *de re*), S_3 only yields a true proposition under a *de dicto* interpretation. Then, he can say that S_3 is, at least, ambiguous.

[6] The view that belief contexts show that Leibniz' Law is false is very common in the literature. For an example of this kind of argument, see: Leonard Linsky, "Substitutivity" (1965). *The Journal of Philosophy*, Vol. LXII, No. 6

proposition, but being ignorant of the basic arithmetic truth that 9 = 3^3 he might not know that the sentence '3^3 is greater than 7' expresses also the proposition expressed by the former sentence, and consequently he might not know that it is true. Now, how does this work for the critic of (F)? We can run a similar argument with the sentences: S_5 'Hesperus appears in the evening' and S_6 'Phosphorus appears in the evening'. What can be said about *x's* believing either S_s or S_6?

The story is so common that I will content myself here only with mentioning the general points. The ancient Babylonian astronomers used the names 'Hesperus' and 'Phosphorus' to refer to the evening and the morning appearance of Venus in the sky, respectively, in the belief that they were designating two different celestial bodies. Their error was shared by many. Only when better methods of observation made possible to realize that there were no two different stars like the 'morning star' and the 'evening star', but only one celestial body which was given two different names by some people, the error was corrected. We, nowadays, know that the statement 'Hesperus = Phosphorus' expresses a true proposition, and find no trouble substituting one name for the other. Did the ancient Babylonian astronomers know the proposition 'Hesperus = Phosphorus'?[7] Let us see the statements:

(12) The Babylonian astronomers believed that Hesperus appears in the evening.

(13) The Babylonian astronomers believed that Phosphorus appears in the evening.

It seems tempting to join the critic of (F) in his contention that whereas (12) is true, (13) is false, since it is obvious that the Babylonian astronomers did not believe that Phosphorus appears in the evening. On this line of argumentation, the pair S_5 and S_6 seems to falsify (F). Furthermore, it has been objected that since the sentences (12) and (13) express a single proposition (given that Hesperus = Phosphorus), it remains to be decided

[7] We do not need to appeal to ancient astronomers to make this point. Strictly speaking, it can be generalized to any possible knower which might be aware of the correlation between a particular name and an object (or property) but might be ignorant of the correlation between an alternative name or (property) and the same object. He may know, for example, that 4 is greater than 2, but be ignorant of the fact that 2^2 is greater than 2.

whether the Babylonian astronomers believed any proposition at all.[8] Roughly speaking, the question seems to be this: The objects of knowledge are propositions; one and the same proposition can be expressed by different sentences. To believe a proposition is at least to assent to one of the sentences which expresses that proposition. (12) and (13) express the same proposition, so it needs to be decided whether or not, one who believes (12) believes (13) also. I think there are interesting arguments that support conflicting answers to this question, but I will not take issue with this problem here. Let us concentrate in our original problem. In which way the pair S_5 and S_6 counts as a counterexample to (F)?

The critic of (F) may propose a discussion of S_5 and S_6 which parallels the case for our old acquaintance, the pair S_1 and S_2. But if he wishes to do so, we could respond to the latter example in the same way we did to the former. Instead, he may claim that the new pair is a counterexample to (F) in belief contexts. It shows that direct names are not substitutable *salva veritate*. He may even press the issue a bit more and insist that the pair S_5 and S_6 falsifies (B) also, since the only requirement for two things to be considered numerically distinct is that one has a property the other lacks, and here we have a situation in which (12) has the property of being believed by the Babylonian astronomers, while (13) lacks that property.

But, what kind of property is the property of being believed by *x*? Supposedly is the property which can be predicated of some sentences, but not of others. I submit that there is a strong metaphysical confusion here, since 'being believed by *x*', is only an epistemic property, something that depends on us, on our conventions regarding knowledge and belief; but certainly whatever the property of 'being believed by x' may be, it does not give a suitable characterization of any object. On the other hand, analysis of the implications of belief contexts raises some aporematic conclusions. It might turn out that if the Babylonian astronomers did not believe S_6 then, they could not have believed S_5 either, since both sentences express the same proposition. Furthermore, by the same token it is possible to defend the exact opposite conclusion. Not only the Babylonian astronomers believed S_5 and S_6 but they also believed that Hesperus is Phosphorus.

[8] If Hesperus is Phosphorus, several views about the truth values of (12) and (13) as well as about the substitutivity of one of the names of the planet for the other are possible. John Tienson enumerates these views as follows: "The Naive View holds that substitutivity fails, and that [12] is true and [13] false. You can insist on substitutivity of names in belief contexts either by maintaining that both belief attributions are true -the Sophisticated View- or by maintaining that both belief attributions are false -the Sceptical View." John Tienson, "Hesperus and Phosphorus". *Australasian Journal of Philosophy*, Vol. 62, No. 1 (1984).

Here is how. To run this argument we only need to recall that the objects of our knowledge are propositions which can be expressed by several, perhaps infinite, equivalent sentences and in some sense to know one of them enables us to know its equivalents. Conjoining this claim with the proposition:

(14) The names 'Venus', 'Hesperus' and 'Phosphorus' designate the same astronomical object

and the undisputable fact of self-identity, it is possible to assent to:

(15) We know that Venus = Venus

By two applications of (B) to (14) we may conclude that the proposition 'Hesperus is Phosphorus' is the same proposition as 'Venus is Venus'. And from (14), (15) and another application of (B) we may reach the following conclusion:

(16) We know that Hesperus = Phosphorus.[9]

This seems to me a rather counterintuitive conclusion and I believe it provides some grounds to doubt the contentions of the critic of (F). On the other hand, the puzzle of substitution in belief contexts can be blocked by restricting substitution to contexts of this kind, and it can be solved by reading the claim as a counterfactual. The Babylonian astronomers did not believe S_6, but if they had known (14), or even a more restricted proposition like 'Hesperus = Phosphorus', they would have believed it. After all, beliefs are the kind of mental states which can be changed and adjusted with the deliverances of experience.

IV

I believe that the relation among (F), (A) and (B) is out of question. Its exact nature, however, needs to be clarified yet, but I will not be concerned with

[9] There is a great deal of debate as to whether the names 'Venus', 'Hesperus' and 'Phosphorus' are direct designators or rigid designators (in a Kripkean sense). G. W. Fitch in "Are There Necessary *a Posteriori* Truths?" (*Philosophical Studies*. Vol. 30, 1976) argues for the view that we know both (15) and (16) *a priori*. As it is well known, Kripke argues for the opposite view. In "Naming and Necessity" he claimed that identities like 'Hesperus = Phosphorus' are necessary but we know them only *a posteriori*. I will not deal with this problem here.

such a project here.[10] I think, I have shown that the alleged counterexamples to (F) are far from being knocked out cases. One can suspect also, that the Principle of Identity does not imply the Principle of Substitutivity, since even granting the critic of (F) his point, the paradoxes raised do not seem to be damaging to either (A) or (B). In his insightful paper, Cartwright challenges the Leibnizian to prove that there are not counterexamples to the Principle of Identity, but he considers such a project as hopeless since, on his view, it would require appeal to some more fundamental principle which may not be available. This challenge strikes me like misdirected. Proof by counterexample is a normal procedure when one wishes to establish invalidity or falsity, but I have heard of no one who asks for a demonstration of the non-existence of counterexamples to prove a principle true. One might ask for the existence of counterexamples but not the other way around. On the other hand, the burden of the proof should be on the critic's side, and I do not think we have been given a full-blown argument to the effect that (F) is false yet.

I submit that the Principle of Substitutivity can be salvaged by introducing restrictions to it, which seems to be the way Leibniz himself understood it. Some might regard this proposal as a desperate move. They may ask: 'why would we want a restricted version of (F)?' and insist on their charge about *F's* falsity. This could be a fair reaction, but I am not deeply impressed by their efforts to show (F) false, let alone by their frequent confusion of (F) with either (A) or (B). In fact, it seems that many, who have been entangled in this confusion, have rejected Identity, due to their qualms to Substitutivity. That this confusion is not granted by Leibniz' formulations, no matter how careless they may be, can be seen with little effort.

As suggested before, (A) and (B) are converse formulations of a general principle, and perhaps Leibniz considered them as alternative ways to convey self-identity. In no way did he commend the belief that two numerically distinct things could be identical, that is, that they could become one. His doctrine of the Monads gives us enough reasons to support this claim. In fact, he suggests in the Monadology that no two Monads (and *a fortiori* not two things which are all aggregates of Monads)

[10] Benson Mates hints to a characterization of each of the principles expressed in (A) through (F). As to the relation of the principle of Identity of the Indiscernibles and both halves of the *Salva Veritate* Principle, he writes: "If *A* and *A'* are the complete concepts of two distinct individuals, then, by the principle, there will be a concept *B* that is in *A* but not in *A'*, so that the essential proposition '*A* is *B*' will be true, but '*A'* is *B*' is false. Thus the principle implies the right-left half of the [*salva veritate*] criterion. But the latter does not seem to imply the former." Benson Mates, *The Philosophy of Leibniz*, New York: Oxford University Press, 1986. p. 135.

can be exactly the same: no thing can be only numerically different from another. The Monads are essentially non-quantitative, and number by itself is merely a measure of quantity. The Monads differ from one another in quality or intension alone, so that two Monads not differing in quality are impossible.[11]

In a letter to Clarke, Leibniz wrote "There are no two indiscernible individuals (...) to suppose two indiscernible things is to suppose the same thing under two names", and in his *Noveaux Essais* he held the doctrine that there cannot be "two individuals perfectly similar, equal and *indistinguishable* in themselves", since this would contradict the principle of individuation. He goes even farther and argues that in absence of the principle of individuation, there would be neither individual distinctness nor separate individuals.[12]

Taking Leibniz' ideas on identity at face value, and his formulation of (A) and (B), it becomes clear that the Principle of Identity only holds for self-identity when it is applied to real objects. However, there is nothing that prevents us from using it in an unrestricted way to account for the sameness of linguistic or logical entities. But what can be said of (F)? The Principle of Substitutivity should not be read as a criterion of identity of things but as a rule of the use of names. As Ishiguro rightly pointed it out, in the first edition of her book:

> To treat two names as names of the same things is in Leibniz' logic to treat them as expressing the same individual concept. To say of two concepts that they are identical is nothing more nor less than to say that one can be substituted for the other in all propositions (apart from special intensional contexts) without change of truth value of the proposition (which is a complex concept made up of concepts). Thus C and C' express identical concepts if they have the same use. Of course this presupposes that we have an independent way of knowing when a particular context is an intensional one.

[11] "Indeed, each Monad *must be different from every other*. For in nature *there are never two beings which are perfectly alike* and in which it is not possible to find an internal difference, or at least a difference founded upon an intrinsic quality [*denomination*]". (My italics) Leibniz, Monadology, Section 9. In *The Monadology and other philosophical writings*, London: Oxford University Press, 1925. p. 223

[12] G. W. Leibniz. *New Essays on Human Understanding.* Book II, Ch. xxvii 230. London: Cambridge University Press, 1982. In the same place, Leibniz defines the *Principle of Individuation* in the following terms: "What is called the *principle of individuation* is existence itself, which determines a being to a particular time and place, incompatible to two beings of the same kind. (...) The 'principle of individuation' reduces, in the case of individuals, to the principle of distinction of which I have just been speaking."

> I have suggested that a context is intensional if there is a reference to the words themselves or to the meaning of words.[13]

It seems then, that it is necessary to restrict the contexts in which (F) holds, at least to non intensional contexts. If it turns out that (F) holds only in contexts where extension is involved (excluding all cases in which the proposition is merely embedded in intensional contexts) then what the Principle says needs to be true. To solve many of the objections raised against it, we only need the distinction between intrinsic and extrinsic properties and realize that historical facts affecting persons (or entities) become extrinsic properties which do not contribute to their individuation. In this way we might respond to some of the arguments from belief contexts. Historical facts are essential properties. However, my believing those is not an essential property but a propositional attitude that I may have, yet an attitude that can be adjusted, refined or changed.

Of course there are other possible formulations of the Principles involved in (A), (B) and (F), in particular, there are formulations which avoid all reference to the notion of 'truth' and are stated exclusively in terms of properties.[14] These formulations seem to escape the problems of the alleged counterexamples to (F) and collapse (A), (B) and (F) in a general principle about identity conditions. On the other hand, as I suggested before, the relation among (A), (B) and (F) needs to be spelled out, in order to obtain a proper understanding of the so-called Leibniz' Law. I would not discuss this point here. Let me just stress that I found highly desirable to distinguish between an analysis of identity, which can be undertook by means of (B) and (C) and a criterion of substitutivity that can be provided by (F). I will finish this paper by expressing my agreement (again) with Ishiguro's treatment of this matter. Leibniz did not mean (F) as a general definition of identity, but as a principle which defines the identity of concepts or what is to count as words or sentences expressing the same concept.

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[13] Ishiguro (*Op. cit*). p. 33.

[14] This is the way suggested, among others, by Biro and Gibbard. According to the latter, in his paper "Contingent Identity", the correct version of Leibniz' Law is "... a law about properties and relations: *if x = y, then for any property, if x has it then y has it, and for any relation and any given things, if x stands in that relation to those things, then y stands in that relation to those things*. The law so stated yields substitutivity of identicals only for contexts that attribute properties and relations." Allan Gibbard, Contingent Identity, *Journal of Philosophical Logic*, Vol. 4 (1975). p. 201.