Individuality without Identity

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The article introduces a concept of individuality without identity in order to shed a new light on perplexities of a standard notion of identity. The concept takes inspiration from Leibniz's original account of the principle of identity of indiscernibles and enables us to understand the principle in a manner precluded by its modern formal logical rendering. Moreover, it is designed as a notion complementary to a concept of identity without individuality, which was frequently discussed in recent 70 years due to its prospective applicability on subatomic particles. Entities without individuality, rather than being mere chimeras, turned out to be, whether we like it or not, basic ontological units of our fundamental scientific theories. If this is not arbitrary, as I believe, and there are systematic reasons for any theory to ultimately rely on basic entities without individuality, individuals without identity are, on the contrary, systematically excluded from any basic vocabulary of a theory. Therefore, the two concepts cannot be complementary in their theoretical significance, since the meaning of the latter will inevitably remain merely therapeutical, signifying that which has been excluded from our theories, a transcendental difference between a theoretical, systematic representation and its subject.

Key words: identity, individuality, discernibility, principle of identity of indiscernibles, infinite analysis

Introduction

The principle of identity of indiscernibles (PII) has attracted considerable attention throughout twentieth century both in secondary literature

on Leibniz and in systematic discussions on logic and ontology. Despite the fact, quite surprisingly, Leibniz's own wording and definition of the principle is quickly substituted in these texts by its modern paraphrasing, which differs substantially from the original account. In this article I want to present an alternative interpretation of the principle of identity of indiscernibles.

My main points of criticism of the family of standard interpretations of PII address introduction of anachronic notion of identity and correspondent conflation of real things with the ideal ones; a chief selling point of my interpretation should be, besides being more faithful to Leibniz, dissolution of some of the most pressing perplexities pertaining to application of the notion of identity within ontology.

Principal for my interpretation will be introduction of a notion of *individuality without identity*. I consider the introduction of the concept to be the major innovation of my approach.

First let me introduce the standard view.

The standard view

The principle is usually referred to as the "principle of identity of indiscernibles"[1] and it standardly reads:

> If, for every property F, object x has F if and only if object y has F, then x is identical to y.[2]

Moreover, it is a commonplace in systematic philosophical discourses, as well as the logical ones, to cash out "indiscernibility" in terms of sharing all properties. The principle is then in turn formalized along the following lines:

$$\forall F(Fx \leftrightarrow Fy) \rightarrow x{=}y^{3}$$

1 For which reason I chose to introduce it here in the same manner despite the fact that Leibniz's own wording is quite different and would better be paraphrased (in analogy with this standard way of designating the principle) as the principle of "inexistence of numerically different indiscernibles", but we will get into it in more detail later.

2 Forrest (2010).

3 Ibidem.

None of the three, namely the name, the definition or the formalization finds any strong support in Leibniz's corpus, as we will see in the following chapters, yet they are chosen as the most natural, further unproblematized, starting point of a discussion of the principle in Stanford Encyclopedia of Philosophy entries devoted to both Leibniz's philosophy in general[4] and PII in particular[5]. As these entries are presumably the most widely read articles on the topic, written by renowned scholars and regularly actualized, I consider the fact to be quite illustrative of a contemporary consensus and acceptance regarding what we will call the standard interpretation of PII.

Essential features of this view include (i) employment of the modern notion of identity and (ii) cashing out indiscernibility in terms of sharing of properties. (In my own reading, I will try to purge the principle of both.)

What usually follows is an extensive discussion of which properties are admittable to be taken into account, as some properties might easily trivialize the principle[6], while restricting the set of eligible properties too much would presumably render the principle untenable or trivially false[7]. The latter point is then usually made with a help of envisioned purported counterexamples to the principle in a particular reading under consideration. These are often hypothetical spatiotemporal scenarios endowed with some symmetries (translational, rotational or permutational).

4 Thus, Look opens the chapter on PII with a sweeping inference: "In one of Leibniz's typical formulations, PII states that "it is not true that two substances can resemble each other completely and differ only in number [solo numero]" (A VI, iv, 1541/AG 42). In other words, if two things share all properties, they are identical, or $(\forall F)(Fx \leftrightarrow Fy) \rightarrow x = y$." Look (2013).

5 Forrest opens his treatment of PII with a definition quoted above: "The Identity of Indiscernibles (hereafter called the Principle) is usually formulated as follows: if, for every property *F*, object *x* has *F* if and only if object *y* has *F*, then *x* is identical to *y*. Or in the notation of symbolic logic: $\forall F(Fx \leftrightarrow Fy) \rightarrow x=y$." Forrest (2010).

6 The predicates trivializing the principle are those into whose definition sneaks unnoticed the notion of identity itself. Black mentions properties such as *being the very object A* or *being identical with A*. Black (1952). Forrest generalizes it to *impure properties*, by which he means properties defined by means of particular terms, instead of mere general terms, i. e. variables. These include properties such as *being two units apart from B*. Forrest (2010).

7 Some consider precisely Leibniz's original meaning of PII as untenable, identifying it with the, so called, strong variant of PII, which recognizes only *absolute discernibility*. However, more fine-grained distinctions can be made within the group of *absolute discernibles*, restricting the principle to *intrinsic discernibles* (involving only one free and no bound variable – see Caulton (2012)) or even more narrowly conceived, *monadic discernibles* (involving merely a single occurrence of one free variable – see Ketland (2011)). The latter case would presumably be deemed the least defensible.

Problems of the standard view

This standard view entwines discussions of PII with some inextricable perplexities of identity, which recurrently lead from different perspectives to the same dead ends. Both employment of the modern notion of identity and cashing out indiscernibility in terms of sharing properties play their respective roles in this failure.

First, there is inherent problem with the notion of identity. There is something highly paradox, or even nonsensical, about the modern wording of the principle. Black puts it succinctly:

> "If *a* and *b* are identical, there is just one thing having the two names *'a'* and *'b'*; and in that case it is absurd to say that *a* and *b* are two. Conversely, once you have supposed there are *two* things having all their properties in common, you can't without contradicting yourself say that *they* are 'identical'."[8]

What escapes Black's attention is the fact that the source of the trouble here is not that much the entire principle but rather its single component, the notion of identity involved. The same kind of objections can be raised against whatever particular application of the notion of identity, irrespective of whether it be defined by means of PII or not.

Similar argument can be found in Wittgenstein's *Tractatus*; however, Wittgenstein's criticism is explicitly directed towards Russell's notion of identity (which is eventually defined by means of PII), not PII itself:

> "5.5303 Roughly speaking, to say of *two* things that they are identical is nonsense, to say of *one* thing that it is identical with itself is to say nothing at all."[9]

Second, all the appeals to some purported counterexamples are at the end of the day question-begging and there is no independent ground upon which to determine formal criteria for predicates rendering the principle either trivially true or trivially false.

8 Black (1952, p. 154).

9 Wittgenstein (1961, p. 63).

Claims regarding status of the principle range from declaring it to hold with logical necessity or metaphysical necessity to acknowledging it as merely contingent and empirically true.

Hypothetical physical spatiotemporal scenarios cannot rule out that the principle holds contingently of our actual physical universe, because their argument rely usually on a perfect symmetry of a situation, which is a condition nowhere to be seen in our actual world.

If they aim to establish that the principle at least cannot hold of metaphysical necessity, since the scenarios in question are still "possible", they cannot fare much better; because their description of these presumably symmetrical scenarios are inevitably incomplete and we can never be sure that the possibility under consideration is a genuine physical possibility. Typically, they present a universe which is completely empty except for two or three or whichever considerably small number of perfectly similar well demarcated spatial objects, ignoring altogether their gravitational force, kinetic energy, movement, dark mass complementary to their own mass, interacting particles – what kind of possibility is this then? Is it still a physical possibility or rather a geometric one?

For every such PII violating scenario a PII conform redescription can be offered[10]. Sometimes a redescription is way more complicated than the original description. This might lead to an idea that the principle should be rejected on epistemological grounds as violating Occam's razor principle regarding description of a structure of physical space. But this neglects the fact that both the original description violating PII and its PII conform redescription are hopelessly underdetermined[11] and what seemed at a first sight as simpler description might eventually turn out as much more complicated, once all its implications regarding so far ignored laws of nature are taken into consideration.[12]

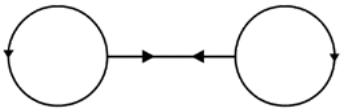
10 Overview of various spatiotemporal counterexamples with correspondent attempts to redescribe them in conformity with PII can be found in Forrest (2010). The strategy dates back to Clarke, who employed hypothetical spatiotemporal scenarios as counterexamples to PII in Leibniz-Clarke correspondence (Leibniz 1969, s. 675–721) and Black's (1952) treatment of two exactly resembling spheres in an otherwise empty universe became a standard starting point for most of the subsequent discussions on PII, beginning with O'Connor (1954) and Rescher (1955), through Hacking (1975) and Adams (1979), up to Saunders (2003) and Forrest (2010).

11 See Hacking (1975).

12 As Hacking aptly writes in this context: "There can be no determination of spatial relations without a study of the laws of nature attributed to objects in space." Hacking (1975, p. 250).

It seems that the possibility thus described should better be conceived as merely geometrical rather than physical. Perhaps then, the counterexamples will not disqualify the principle as metaphysically necessary but at least it can show that it cannot be logically necessary. However, in order to do that, we cannot stick with vague verbal description of a geometrical situation and we must turn our sight to more fundamental language of mathematics.

Then our question simply boils down to the kernel of discussions about mathematical structuralism: is everything mathematics describe of merely relational nature, or do we need identity as primitive in order to establish some fundamental mathematical objects? This calls for quite different kind of counterexamples to PII such as the *dumb-bell* structure[13]:



Hellman[14] is mildly optimistic about fiddling a specific variant of mathematical structuralism immune to these counterexamples, others such as Ketland[15] are more sceptical about it.

It seems to me that working with identity in mathematics is easily much more convenient than trying to do without it; the question remains whether identity can be defined outside of mathematics. It is there that PII enters the game. We *can* take identity as *primitive* in mathematics – even if we might not want to do it for whichever metaphysical reasons; but we *cannot* so easily do it anywhere outside of mathematics. Identity outside of mathematics might not be definable or might have merely vague criteria of its application but it is dubious whether it can ever be taken as "primitive" in any straightforward sense. Reference to real-world phenomena (however we conceive of it) cannot prove statements of mathematics wrong, but it should be able to disprove statements made in natural sciences or natural languages. Hence, the latter should allow for a failure of reference, it should be possible to put identification of its objects in question, it should be possible that we do not really know, "what we are talking about". Even if we embrace an

13 Definable using identity sign as follows: $\forall x \forall y Fxy$ and $\exists x \exists y (x \neq y \text{ a } \forall z (z = x \text{ v } z = y))$ Ketland (2006).

14 Hellman (2007).

15 Ketland (2006).

all-encompassing holism and reject any substantial difference between empirical and mathematical statements, we still sacrifice some useful tools for evaluating certain claims, if we do not allow for this possibility.

Identity

This, now standard, way of interpreting the principle can be traced back to Russell and Whitehead, who were the first to employ a variant of the principle in their definition of identity in *Principia Mathematica*[16]. Russell's notion of identity was by no means universally accepted, notably Wittgenstein strongly opposed it already in his *Tractatus*[17] and till up today some philosophers (inspired by Wittgenstein or on completely independent ground) express their reservations towards the notion; nevertheless, it can be said to have stood the test of time as the notion of identity we use today in mathematical logic shares its basic features with the Russellian notion.

Wittgenstein objected to the identity conceived as a "relation between objects" (*Tractatus*, 5.5301)[18] and defined by PII (*Tractatus*, 5.5303).[19]

As concerns the first point, Wittgenstein considers employment of the notion of identity as a "relation an object has to itself and nothing else" within logical discourses to be unyielding source of major logical perplexities; yet this is precisely how we most naturally conceive of identity today. Identity is, indeed, regarded as a relation – a relation which is *transitive*, *symmetric* and *reflexive*. In particular, the identity relation on a domain *D* is the *smallest reflexive binary relation* on *D*.[20]

These characteristics are sufficient to yield a formal definition of identity.

This concerns Wittgenstein's second point, as he criticised Russell's attempt to define identity by means of PII. However, even today PII

16 Whitehead and Russell (1963, p. 168).

17 Wittgenstein (1961, § 5.5301–03).

18 "5.5301 It is self-evident that identity is not a relation between objects. This becomes very clear if one considers, for example, the proposition '$(x):fx.\supset.x = a$'. What this proposition says is simply that *only a* satisfies the function *f*, and not that only things that have a certain elation to *a* satisfy the function *f*. Of course, it might then be said that *only a* did have this relation to *a*; but in order to express that, we should need the identity-sign itself." (Wittgenstein, 1961, p. 62).

19 Wittgenstein (1961, § 5.5301–03).

20 Ketland (2011, p. 172).

(in its modern formal rendering) offers the most convenient resources to define identity formally.

Thus, there is a second order definition of identity, namely,

$$\forall x \forall y[x = y \leftrightarrow \forall X(Xx \rightarrow Xy)],$$

which is directly derived from a second order rendering of PII, reading:

$$\forall x \forall y[\forall X(Xx \rightarrow Xy) \rightarrow x = y)].$$[21]

Ketland (2011) mentions alternative second order definitions utilising the abovementioned fact that identity is the *smallest reflexive binary relation* on a domain,

$$\forall x \forall y[x = y \leftrightarrow \forall R(\forall z Rzz \rightarrow Rxy)],$$

or

$$\forall x \forall y[x \neq y \leftrightarrow \exists R(\forall z \neg Rzz \wedge Rxy)],$$

which only encapsulates the basic idea of PII employing the weakest notion of discernibility[22], namely, that two objects are distinct just in case there is at least an irreflexive relation holding between them.[23]

21 Ibidem, p. 171.

22 Versions of PII can be ordered from the strongest to the weakest depending on what counts as indiscernible for it. Most of the authors writing on the topic discriminate between at least two categories: *absolute* and *relative* discernibility, where either a relation suffices to discriminate things, or a genuine property (one place predicate) is needed. Quine (1960) These two categories can be further broken down. Relative discernibility can be broken down into proper *relative discernibility*, where non-symmetric relation is required to discriminate between entities, and *weak discernibility*, where any irreflexive relation suffices. Saunders (2003), Ketland (2011), Caulton (2012). Absolute discernibility can be broken down in more than one way. Whereas Ketland divides *absolute discernibles* into those discerned by monadic predicates (based on (2) *monadic indiscernibility*) and those discernible only by polyadic predicates (based on (3) *polyadic indiscernibility*), Caulton and Butterfield allow polyadic predicates to discriminate between *intrinsic discernibles*, as long as they (i) involve only one free variable (being an instance of *absolute discernment*) and (ii) involve no bound variable, while the remaining portion of absolute discernibles is then defined as follows: "(Ext) *1-place formulas with bound variables, which apply to only one of the two objects a and b.*" Caulton (2012, p. 17).

23 Note that these latter definitions rely on a formula of a reflexive relation utilising multiple occurrences of the same variable ($\forall zRzz$) which might be circular, after all.

However, the case of first order definability of identity is perhaps even more telling. There is broad consensus that the, so called, *Hilbert--Bernays definition* (HB) of identity is "the only analysis of identity that is really workable from a modern logical point of view"[24] – which being first formulated by Hilbert and Bernays in their *Foundations of Mathematic* (1934) and subsequently endorsed by Quine (1960, p. 230), never actually fell out of favour among philosophers and logicians alike. Ketland reserves the word *identity* for the second-order concept and calls this HB definition a *first-order indiscernibility*:

> "Let P be a primitive n-ary predicate symbol ($n \geq 1$) of L. Let $z_1,\ldots, z_{n-1}$ be a sequence of distinct variables, all distinct from x and y. Let $x \approx_P y$ be the formula
>
> $$\forall \underline{z}(Pxz_1 \ldots z_{n-1} \leftrightarrow Pyz_1 \ldots z_{n-1}) \wedge \forall \underline{z}(Pz_1xz_2 \ldots z_{n-1} \leftrightarrow Pz_1yz_2 \ldots z_{n-1}) \wedge$$
>
> $$\ldots \wedge \forall \underline{z}(Pz_1 \ldots z_{n-1}x \leftrightarrow Pz_1 \ldots z_{n-1}y).$$
>
> The first-order indiscernibility formula for L, written $x \approx_L y$, is the conjunction $\wedge \{x \approx_P y : P$ is a primitive predicate symbol of $L\}$."[25]

This definition utilises PII (again, in a variant recognizing weak discernibility as sufficient for discerning entities) but adapts it into first-order setting. In order to do that, we must restrict our notion to a particular *finite* language (since we cannot quantify over predicates and must therefore write down a separate axiom for every single predicate of the language in question). This already indicates how it can fail to express genuine identity relation:

24 Saunders (2003, p. 4). Although, e. g., Ketland opposes Saunders' claim. Ketland is justified in claiming that first-order logic with identity is more expressive than first-order logic without identity, as there are structures such as dumb-bell which cannot be defined in first-order language with merely HB indiscernibility as a substitute for identity. Ketland (2006, p. 312) Nevertheless, as far as I can see, neither Ketland, nor anyone else proposes any other, competing, first-order definition of identity and hence HB account remains still "the only workable" – if not in every respect satisfactory.

25 Ketland (2011, p. 175).

> "The second-order definition of identity says that *a* and *b* are identical just when they are not discernible by *any* property. However, when we restrict to a particular structure M, and the usual first-order language for describing M, then not *all* properties and relations need be *definable*. And, to speak loosely, we have $a \approx b$ exactly when *a* and *b* are not discerned by the properties and relations *definable* in the structure. Unsurprisingly then, we may have that *a* and *b* are indiscernible in a structure even though they are, in 'reality,' distinct elements of the domain."[26]

Understanding of PII in its modern sense is thus intimately tied up with understanding of the modern notion of identity. Their dependence is mutual: not only is the identity employed in all variants of the standard definition of the principle but also conversely the principle itself offers the only "workable" means of defining the identity.

Analysing limitations of the definition of identity can therefore in turn shed light on limitations of the standard interpretation of PII.

Resolving perplexities regarding identity

Let me repeat Wittgenstein's objection to Russell's notion of identity:

> "Roughly speaking, to say of *two* things that they are identical is nonsense, to say of *one* thing that it is identical with itself is to say nothing at all."[27]

To explain away the paradox nature of statements about identity by claiming that it is merely the names, which are two, while the object is really one, seems too deflationary[28], since identity statements should be capable to bear informational value beyond the simple linguistic point. Frege[29] tried to remedy this by inserting sense between a name and

26 Ibidem.
27 Wittgenstein (1961, p. 63).
28 See Frege (1997, p. 156).
29 Frege (1997, p. 156).

its referent – whereas it is the senses, which can differ, while having the same denotate. Philosophers used to cherish the idea of formalizing natural languages by means of intensional logic. Nevertheless, except for these ambitious philosophical projects, in most mathematical and scientific discourses senses never made much sense and identity is simply a one-dimensional relation between objects. However, it all boils down to what kind of objects are these referents of expressions.

They are values of variables. Identity statements simply state that two expressions have the same value. If we ask what kind of role do these objects play, over and above being a ground for identification of values of certain variables, while distinguishing values of others, we cannot be given any positive answer.

Here comes into play another early Fregean tenet: "Only in the context of a proposition do words mean something."[30] At the end of the day there is only one genuine, irreducible, extension of expressions and that is the extension of truth values. The only genuine objects are *truth* and *falsity*, while other objects have no intrinsic content of their own, no being, aside from being substitutable under preservation of truth value. They determine rules of substitution among expressions, nothing more, nothing less.

Quine once said that:

> "The useful ways in which people ordinarily talk or seem to talk about meanings boil down to two: the *having* of meanings, which is significance, and *sameness* of meaning, or synonymy."[31]

This might not express the whole truth about meaning but it definitely expresses the whole truth about objects in logical discourses. Quine's own dictum that to be (for this object) is to be a value of a bound variable[32], aptly designates the mode of being of these shadowy entities. The dictum determines not only which entities will be granted reality (i. e., that to which bound variables of a theory refer) but also the nature of the reality: for them *to be* is *to be a value of a variable*. Thus, *to be* is

30 Ibidem, p. 109.
31 Quine (1948, p. 31).
32 Ibidem, p. 34.

not *to be perceived*, *to be manifested*, *to be causally efficacious*, *to be changing* (itself or others) or simply *making a difference* – all of which to a certain extent express our intuitions regarding what is real. To be is not *to be this individual thing*. To be in Quine's sense is to be *whatever* can be *substituted* for a variable: ∃y(x=y). To be is to be "*whatever*": to be is *to be substitutable*. It follows straightforwardly what *to be* is: *not to be individual*. By granting existence to something, in Quine's sense, we immediately deny it thereby proper individuality.

Objects

The thin notion of object just introduced is inseparable from the modern notion of identity and its PII based definition – hence another Quine's dictum "no entity without identity".[33] Bar-Elli conceived of PII as being responsible for "formation of the notion of object" within a particular language.[34] Saunders sees "nothing wrong with identity taken as primitive in the most general context" but he is convinced that identity is in a need of definition when appearing in context of physical theories because:

> "It would be hard to imagine a quantity whose measurement could tell us about this directly. Nor is the identity relation itself under investigation in physical theorizing, unlike measurable properties and relations (in this sense it is not treated as a physical relation at all)."[35]

Hence its formal definition by means of PII. In particular, he opts for HB account (the only analysis of identity "workable from a modern logical point of view"). Saunders[36] begins his exposition of HB account of identity with a scheme of familiar postulates of identity: everything is identical with itself and if two things are identical and if one of them has a certain predicate, then the other has the predicate as well:

33 Quine (1969, p. 23).
34 Bar-Elli (1982).
35 Saunders (2003, p. 2).
36 Saunders (2003).

$$s = s$$

$$s = t \rightarrow (Fs \rightarrow Ft)$$

noting that it essentially expresses the *substitutivity of identicals*.[37] This substitutivity is, of course, substitutivity *salva veritate* (SV). It is substitutivity with respect to a particular language with particular truth values ascribed to all its sentences. As we have seen, Ketland[38] pointed out this as an irredeemable limitation of first order accounts of identity, rendering them in his view contrary to Saunders not "workable" after all.[39] The language in question must have finite vocabulary and all the properties and relations capable of discerning must be definable in it. However, if the language is to describe some extralinguistic reality, some objects, properties and relations having a reality of their own independent of their determination in language, then these real determinations must somehow transcend the linguistic definitions. Moreover, if the language is to be of any use in scientific enterprise, truth values of its sentences cannot be given in advance, before empirical enquiry – and if this be so, we cannot determine identity of objects we are working with before determining truth value of all sentences whose bound variables refer to them, which seems as a rather superhuman feat. We need an access to the objects of our theories independent of the theories themselves in order to (i) understand them somehow before we evaluate them, (ii) secure their touch with some extralinguistic empirical reality.

The ease with which Saunders and Quine let PII merge with SV definition of identity is a clear symptom of their conflation of real objects with mere abstracta.

Salva veritate criterion and identity of indiscernibles

Already Mates warns us from conflating the two principles, based on a fact that Leibniz applies PII exclusively to individual substances, whereas

37 Ibidem, p. 3.
38 Ketland (2010).
39 Ketland (2006, p. 312).

> "the *salva veritate* criteriuon is applied also to cases like *Felix et pius idem est* and *Triangular et trilaterum idem est*, where the terms concerned are general, not singular."[40]

Mates is on a right track here, but his choice of words is unnecessarily circumspect, and we are justified in adopting much stronger wording. The two principles are mutually exclusive, as they pertain to two mutually exclusive kinds of entities: whereas identity of indiscernibles pertains exclusively to *real beings*, salva veritate pertains exclusively to *ideal beings*, i. e. abstracta. Moreover, despite the rather unfortunate nickname "principle of identity of indiscernibles", only one of the principles is a genuine "principle of identity" and it is not PII but SVC (as Mates also indicates as he does not include PII among "criteria of identity", which include SVC and a symmetry axiom for identity). If SVC is a proper principle of identity, then PII would best be called a principle of individuality. The two kinds of beings identified or individuated, respectively, are then distinguished by different modes of being, which can readily by read off from the way the two principles were originally formulated. Ideal beings are characterised precisely by the fact that they are identified as substitutable. Being identifiable boils down to being within an extension of a general term, hence not a singularity, not a proper individual, but something substitutable. This is what SVC states. PII on the contrary states that there are no substitutable real beings, real beings are irredeemably individual – with a consequence Leibniz himself nowhere explicitly endorses, yet fully consistent with a rest of his views, that real beings are not identifiable.

Let me justify my claims by analysing Leibniz's original account of PII.

Leibniz's formulation of PII

Curiously enough, despite the now ubiquitous nicknaming of the principle as the "principle of identity of indiscernibles", there is no mention of identity in Leibniz's original phrasing[41]. Neither is there any mention

40 Ibidem. Což pak se musí změnit na Mates…

41 Leibniz uses the name "identity of indiscernibles" later in the correspondence with Clarke on a single occasion (Leibniz, 1969, p. 687) as a matter of convenience, I believe; however, he never defines the principle in this way, as demonstrated in the following.

of properties, not to say predicates. Leibniz usually formulates PII in the following manner:

> "there cannot be two individuals entirely similar or differing only in number."[42]

Keywords in this definition are: (i) individuals, (ii) entirely similar and (iii) differing only in number. As for (i), most of the wordings read "individuals" (*individus*)[43], some of them "substances" (*substances*)[44], some "things in nature"[45] but once Leibniz choose the expression "real absolute beings" (*etres reels absolus*)[46] only to change for "sensible things" (choses sensibles)[47] a few lines later and eventually in the same writing (his fifth letter to Clarke) he even settled simply on "things" (*choses*)[48]. As concerns (ii), alternative phrases are "resemble each other completely" (*ressemblent entierement*)[49], "perfectly alike"[50], "[not] different in nature" (diversae naturae)[51] and "indiscernible from each other" (indiscernables)[52]. The last keyword remains unaltered in its wording throughout most of the statements.

Regarding the first keyword, Mates is justified in restricting the use of the principle to individual substances. But then, he is somehow puzzled

42 Leibniz (1969, p. 336).

43 Leibniz alternates between "individuals" (Leibniz, 1969, pp. 336, 687), or "individual things" (Leibniz, 1969, p. 268), or "real or complete individuals" (Leibniz, 1896, p. 331–332).

44 Leibniz (1969, p. 308), Leibniz (1969, p. 534–535).

45 "there are never two things in nature which are perfectly alike and in which it is impossible to find a difference that is internal or founded on an intrinsic denomination" (Leibniz, 1969, p. 645).

46 Leibniz (1969, p. 699): "there are not in nature two real, absolute beings, indiscernible from each other".

47 Leibniz (1969, p. 699): "I said that in sensible things two that are indiscernible can never be found; that, for instance, two leaves in a garden or two drops of water perfectly alike are not to be found."

48 Leibniz (1969, p. 700).

49 Leibniz (1969, p. 308): "it is not true that two substances can resemble each other completely and differ only in number".

50 Leibniz (1896, p. 331–332): "In a word, we shall never find the final logical species, as I have already remarked above, and two real or complete individuals of one and the same species are never perfectly alike."

51 Leibniz (1969, p. 534–535): "all substances are different in nature, and there are no two things in nature which differ in number alone."

52 As far as I know, Leibniz actually started using the word no earlier than in his correspondence with Clarke: Leibniz (1969, pp. 687, 699, 700).

by the fact that Leibniz does not hesitate to support his claims regarding universal validity of the principle by bringing up empirical evidence to it, despite its (by Leibniz explicitly endorsed) necessary metaphysical status. The principle clearly cannot hold merely contingently of this actual world, it holds of necessity about every possible world created by the infinitely good and omniscient God. Nevertheless, Leibniz is willing to use expressions such as "sensible things" on the occasion of defining the principle, instead of sticking with the more accurate term "individual substances" or "monads".

Regarding the second keyword, a similar puzzle can be formulated: why Leibniz opts for vague empirical notions of discernibility, resemblance and similarity, if his metaphysics offered much more precise conceptual framework of predicates, whose complete list unequivocally individuate every individual substance.

However, the puzzles can easily be resolved if we admit two seemingly paradox claims: (i) individual substances are not *identifiable*, (ii) not only we cannot piece together a complete list of all predicates individuating a primary substance, we are unable to identify even a single one. These might not be the words Leibniz would have endorsed – but this is only because he did not have the notion of identity we have today and could not therefore ascertain all its implications we have been analysing so far.

It is true that every individual substance is fully expressible by its complete concept[53] consisting of all the predicates correctly predicable of it. However, since there is infinity of such predicates expressing all the relations of the particular substance to everything there ever was and ever will be, "mirroring"[54] thus the entire universe, it requires an infinite analysis[55] to grasp this complete concept, which no finite mind can accomplish. No finite mind can therefore properly identify this individual substance. Moreover, it cannot identify even a single real predicate of the substance, as the predicate is genuinely individual as well.

53 See Leibniz (1969, pp. 265, 334, 335)

54 See Leibniz (1969, pp. 473, 530, 559, 576, 637, 640, 648, 649, 651, 659, 663, 711).

55 Leibniz distinguishes two types of analysis, both of them proceeding „from the posterior by nature to the prior by nature": an analysis of necessities, which reaches the ground level of primitive (though merely relative) elements in finitely many steps, and an analysis of contingents, which "proceeds to infinity without ever being reduced to primitive elements". Leibniz (1969, p. 664).

From this point of view it makes very little sense to try to identify a real entity by identifying all its predicates, thus distinguishing it from other entities, as implied by the standard rendering of PII analysed above. Rather than identifying entities, we must properly individuate them (just as we must individuate their predicates) in the first place – and this is the aim of Leibniz's original PII.

This construal clearly undermines not only the specifically modern *facon de parler*, but generally, any subject-predicate talk – upon which the entire Leibnizian metaphysics based on complete concepts apparently rests. Neither the subjects, nor the predicates are particularly suited to fulfil their respective task. Usually, subjects are responsible for *individuation* and predicates for *qualification*. However, Leibnizian real substances as subjects of predication can never be properly individuated by us, and hence, can never be unequivocally identified in a series of predication. For what use is it then in our talk about things of this world? While a subject grants identity to the predication, a predicate qualifies this identity, grounding similarity relations between this subject and other subjects. However, Leibnizian real attributes are completely individual, and hence, cannot be shared by more than one individual and cannot, therefore, establish any similarity relation. How informative can predication of such attributes be? Leibniz hints at a solution in his reply to Arnauld:

> "On the first point, you say with very good reason, that it is no more possible to conceive of several possible Adams, if Adam be taken as a singular nature, than it is to conceive of several 'myselves'. I agree. But when I speak of several Adams, I do not take Adam for a determined individual but for some person conceived in a relation of generality (*sub ratione generalitatis*), under circumstances which seem to us to determine Adam to be an individual but which do not truly do so sufficiently; as for instance, when we mean by Adam the first man, whom God puts in a pleasure garden, which he leaves through sin, and from whose side God makes a woman. But all this does not sufficiently determine him, and so there might be several other disjunctively possible

> Adams, or several individuals whom these conditions fit. This is true no matter what finite number of predicates incapable of determining all the rest one takes. But that concept which determines a certain Adam must include, absolutely, all his predicates, and it is this complete concept which determines the relation of generality in such a way as to reach an individual (*rationem generalitatis ad individuum*). For the rest, so far removed am I from holding that a single individual is a plurality that I am even deeply convinced of the teaching of St. Thomas about intelligences but hold that it is valid generally, namely, that there cannot be two individuals entirely similar or differing only in number."[56]

We ordinary wish our term "Adam" was a singular term referring to a single individual substance, but in fact, it necessarily works as a plural term referring to a plurality of possible Adams indistinguishable up to a certain point[57]. The actual subject of predication is thus not the complete individual concept but rather an incomplete concept, the general term "Adam", which we mistakenly took for a singular term. Moreover, the actual predicates are not the genuinely individual predicates of the complete individual concept of Adam but rather general predicates – however large number of which is incapable to fully determine an individual, as Leibniz clearly states: "This is true no matter what finite number of predicates incapable of determining all the rest one takes." On the other hand, a single real predicate would suffice to do the job, as it fully "determines all the rest" of them. So, e. g., the general predicate of "having a woman created from one's side" can be substituted with a particular predicate "having Eve created from one's side", yet, here comes a snag, the latter case does not work as a truly particular predicate, unless we construe "Eve" as a full complete concept with its infinity of true predicates already encapsulated in it, i. e., mirroring the entire universe surrounding it, including Adam himself. Thus, if a predicate is to be truly individual, it is to mirror the entire universe, just the way complete concepts do, but then, it is unavailable and quite useless in helping us, finite created beings, to determine individuality of a real thing or event.

56 Leibniz (1969, p. 335–336).

57 Lewis explored this idea in his *On the Plurality of Worlds* (Lewis, 1986).

Leibniz's rendering of SVC

Leibniz makes the contrast between PII as pertaining to *real things* and SVC as pertaining to *ideal things* quite evident already in his first systematic exposition of the idea in the *First Truths*:

> "It follows also that *there cannot be two individual things in nature which differ only numerically*. (…) Never are two eggs, two leaves, or two blades of grass in a garden to be found exactly similar to each other. So perfect similarity occurs only in incomplete and abstract concepts, where matters are conceived, not in their totality but according to a certain single viewpoint, as when we consider only figures and neglect the figured matter. So, geometry is right in studying similar triangles, even though two perfectly similar material triangles are never found. And although gold or some other metal, or salt, and many liquids, may be taken for homogeneous bodies, this can be admitted only as concerns the senses and not as if it were true in an exact sense."[58]

A symptomatic use of triangle example makes the comparison with a typical presentation of the *salva veritate* criterion striking:

> "Same or coincident terms are those which can be substituted for each other anywhere without affecting truth. For example, 'triangle' and 'trilateral', for in all the propositions demonstrated by Euclid about a triangle, trilateral can be substituted, and the converse, without affecting their truth."[59]

It follows from the nature of ideal things that they are substitutable with one another, that they are identified across their various representations. Their being is constituted by this *identification* of materially distinct representations – and does not transcend this identification. Whereas *individuality* of a real being transcend every single *identification*.

58 Leibniz (1969, p. 268).
59 Ibidem, p. 371.

Countability, identity, individuality

My interpretation of PII presupposes consistently keeping *identity* and *individuality* apart. The separation is intended to do justice to Leibniz's distinction between real things and merely ideal objects. However, the separation is motivated by systematic reasons as well. A good deal of confusions surrounding the notion of identity arise from its contamination with traits of individuality and vice versa. Not only that it should be possible to think one without the other, but we should *a priory* look with due suspicion at any conjunction of them. It is highly dubious that an entity can exhibit both at the same time: what is (self)identical cannot be completely individuated and what is individual cannot be properly identified.

Nevertheless, our habit of conceiving *countability*, *identity* and *individuality* together, is so deeply rooted that their connection would appear as a logical necessity or a transcendental rule of reasoning. Seibt[60] blame it on what she calls "the myth of substance" – a well habituated tendency to construe the fundamental ontological level on a model of ordinary objects, positing *particulars* as basic ontological units endowed with a set of properties which under thorough scrutiny will prove incompatible.[61] These include:

> "(P1) *Principle of Unity:* All concrete individuals are unified.
> (P2) *Principle of Concreteness:* All particulars are concrete.
> (P3) *Principle of Independence:* All particulars are independent.
> (P4) *Principle of Individuality:* All and only concrete particulars are individuals.
> (P5) *Principle of Countability:* All (and only) individuals are countable.
> (P6) *Principle of determinateness:* All and only individuals are fully determinate.
> (P7) *Principle of subjecthood:* The properties that are truly attributed to an entity are attributed to the ontological factor that individuates the entity.

60 Seibt (1990), Seibt (1996), Seibt (2010).

61 I discovered her work only recently, but it seems to me that we share the same problems and explore similar conceptual territory, yet we diagnose the problems differently and hence come to different solutions for it.

> (P8) *Principle of categorial dualism:* Ontological structures consist of (simple and complex) particular entities or (simple and complex) universal or multiply occurrent entities, or combinations of both.
> (P9) *Principle of Endurance:* All concrete individuals are identical through time; they do not have temporal parts."[62]

Seibt[63] picks up Quine's treatment of identity as representative of the confusion. She interprets him as first equating *identity* with *sameness*, then with *coreference* of *names* and ultimately with *numerical oneness*, when he reads:

> "'(x)(y)(x is a god . y is a god. → .x=y),' as numerical statements, e.g., 'There is one god at most.'"[64]

According to Seibt's diagnosis Quine intended to define identity as "supra-categorial or transcendental"[65] notion, but by equating it to the relation of coreference of names, he is actually committed to narrowing down its scope to "particular objects", thus, falling prey to "the myth of substance". Although I am equally disturbed by Quine's sweeping reduction of concepts, I doubt that by introducing coreference he commits himself to anything over and above nearly tautological delimitation of the scope of identity to objects which are identifiable: of course, objects which cannot be referred to, cannot be identified either – but whether the reference be singular, plural or even mass reference need not be necessarily specified at this point, though Quine's preoccupation with the first option is well recorded. Moreover, as pointed out earlier, for Quine coreference ultimately boils down to substitutivity of terms or synonymy of expressions, as recounted by Seibt herself; hence, very little commitment to any extra-linguistic "substance" is made. In fact, Quine's objects are as thin, as abstract as possible, lacking all substantiality.

Contrary to Seibt, I am convinced that connecting identity with substitutivity of terms is quite fortuitous step in this regard, yield-

62 Seibt (2010, p. 7).
63 Seibt (2010, p. 9), Seibt (1996, p. 230).
64 Seibt (2010, p. 8) quotes: Quine, W. V. O. (1966): *Methods of Logic*. New York, p. 211.
65 Seibt (2010, p. 8).

ing genuinely formal (or supra-categorial, if I understood Seibt's notions correctly) account of identity, committing Quine to no further inferences regarding nature of extralinguistic reality. But also, sanctioning no such inferences. There is no commitment in the account of identity to transfer characteristics of formal objects, namely their substitutivity, onto reality and meaning and, the other way round, transfer characteristics of reality and meaning, namely individuality and meaningfulness onto formal objects, it is a matter of deliberate decision – which is constitutive in pursuing every formal ontological enterprise.

Despite the difference in diagnosis of the problem, I agree with Seibt that identity should not immediately imply numerical oneness or individuality and even individuality itself should not immediately imply numerical oneness; moreover, pace Seibt, I am convinced that the converses of these should not immediately hold either.

When it comes to "numerical oneness", I suppose that in order for me to understand that something is *one*, I must also understand what it would mean if they were two or three etc., i. e., numerical oneness implies countability and therewith, presumably, the concept of cardinality. I must know how to group and count entities of the relevant kind. This might or might not imply possibility of uniquely labelling them but definitely implies more than mere identity. Nevertheless, identity seems to be at least a minimal precondition for it. Yet, there are people, such as Domenech and Holik[66], who are not willing to grant even this, devising an alternative definition of cardinality presumably expressible without identity based on Quasi-set theory in order to meet challenges of quantum physics. In any case identity is a precondition of reference – and any reference can be successful only with a proviso that a possibility of its repetition is ingrained within its intrinsic structure, i. e., that strictly speaking, there is no singular reference. Of course, the swamp into which Davidson entered can be referred to, it can be identified, it is the same swamp from which his Swampman emerged[67]; however, it makes little sense to ask whether the swamp is one or many and whether if you add to this swamp a neighbouring swamp you get one swamp, two swamps or multiplicity of interconnected swamps. Contrarywise, you can perfectly well count money in your electronic

66 Domenech & Holik (2007).

67 The analogy is based on a thought experiment in Davidson (1987).

bank account, without identifying any individual bits of the money to be labelled and counted.[68]

Identity without Individuality

The idea of *identity without individuality* is not entirely novel to logicians. Although there are people who find it counterintuitive enough not to allow it to play a major role in constitution of ontology of physical objects[69], the notion of *weak discernibility* was employed to discriminate between objects already by Quine[70] and thereafter is regularly used that way.

Weakly discernible are things which are not even relatively discernible. They share all their properties and relations – and the relations holding between them are all symmetric, yet at least one of these symmetric relations holding between them is irreflexive. Ketland defines weak discernibility as follows:

> "(5) a is *weakly discernible* from b in M iff there is a formula $\phi(x, y)$ such that $\neg\phi(a,a)$ and $\phi(a,b)$."[71]

Caulton[72] analyses how different variants of PII can tie up identity with individuality, showing that only the strongest one can do the job – if, of course, we do not demand of every object to possess some kind of *haecceistic* property, each holding of one and only object.

Weakly discerned objects do not possess individuality. This entails that no individual reference to a weakly discernible object is possible. We have no resources to pick and choose one of the weakly discernible objects to give it a name and then pick the second to give it a different name. It might seem merely as a matter of our limited epistemic access, but that would be misleading. In fact, the objects are interchangeable, intersubstitutable, not just in our imagination, but in the reality as well. Thus, Saunders claims that permutations of particles which are exactly

68 See Jantzen (2011).
69 Jantzen (2011).
70 Quine (1976, p. 114).
71 Ketland (2011).
72 Caulton (2012).

alike "does not therefore lead to a possible world numerically distinct from the actual one."[73] In this conclusion he is supported by statistical physics, which under certain circumstances treats permutations of particles as a single state in state space (imagine a complex collision of particles with an outcome of two electrons leaving in opposite directions: there would not be two alternative future developments of the system with either electron A flying right and electron B flying left, or electron B flying right and electron A flying left, but only a single possibility).

This does not preclude any reference to the objects whatsoever, only the singular one. The objects can still be referred to, albeit plurally. The objects cannot be properly *individuated*, but they can be *identified* – as substitutable objects within certain "roles" by proper principles (criteria) of identity. Plural reference as such was rarely explicitly thematized before Boolos[74]; however, already Russell's remark at the outset of modern logic with its novel understanding of identity marks clear departure from Leibnizian requirement of individuality:

> "Is the notion of *one* presupposed every time we speak of *a* term? A term, it may be said, means *one* term, and thus no statement can be made concerning a term without presupposing *one*. In some sense of *one*, this proposition seems indubitable. Whatever is, is one: being and one, as Leibniz remarks, are convertible terms. It is difficult to be sure how far such statements are merely grammatical. For although whatever is, is one, yet it is equally true that whatever are, are many."[75]

Individuality without Identity

On the contrary, *individuality without identity* is something, as far as I know, nowhere to be heard of in contemporary logical and formal onto-

73 Saunders (2003, p. 15).
74 Boolos (1984).
75 Russell (1903, p. 132).

logical discourses[76]. Yet, if my interpretation of Leibniz is correct, all the *real things* within Leibnizian universe possess this characteristic.

I assume that the notion is simply inexpressible by means of modern logic, which works from different paradigm, regarding everything there is as merely *ideal things*, in Leibniz's terminology. Nevertheless, its basic formal features should be sufficiently clear if we take a look at the structure of Leibnizian universe.

No real thing is *identical with itself and different from others*, as axioms of identity would require, because (i) a real thing is in constant change[77], differentiating incessantly from itself by its own actions, (ii) every substance is a "living mirror"[78] of the entire universe so that there is no definable way of picking this particular substance and separating[79] it from the rest:

> "In my opinion there is nothing in the whole created universe which does not need, for its perfect concept, the concept of everything else in the universality of things, since everything flows into every other thing in such a way that if anything is removed or changed, everything in the world will be different from what it now is."[80]

76 Seibt (1996) uses a term "non-countable individuals", while Laycock (2006) speaks about mass reference as having no *object*, in a logical sense sketched above. Despite some verbal similarity (especially on the part of Seibt) their notions are devised with the intention to identify rather than individuate the worldly stuff and neither would endorse individuality without identity in his or her reasoning.

77 "It can be shown adequately from the essential principles of metaphysics that what does not act does not exist" Leibniz (1969, p. 271, n. 10). Moreover, what is ultimately real is a substance (everything else has its being dependent on some substance) and Leibniz occasionally even defines substance by activity: the opening line of *The Principles of Nature and of Grace, based on reason* for example reads: "1. Substance is a being capable of action." Leibniz (1969, p. 636). "So far as I have made the concept of action clear to myself, I believe that there follows from it and is established by it that most widely accepted principle of philosophy — that actions belong to substances [actiones esse suppositarum]. And hence I hold it also to be true that this is a reciprocal proposition, so that not only is everything that acts an individual substance but also every individual substance acts without interruption, not excepting body itself, in which no absolute rest is ever to be found." Leibniz (1969, p. 502).

78 Leibniz (1969, pp. 530, 637, 648, 659, 663, 711).

79 Ketland (2011) introduces the notion of *definable separability* in order to describe structures in which HB definition of identity fails, i. e., structures some of whose objects are not definably separable.

80 Leibniz (1969, p. 524).

An individual substance is nothing but a series of its actions (self-affections, self-differentiations), which are fully spontaneous[81], yet themselves nothing but perceptions[82], representations of the entire universe. The substance thus escapes its *identity*, undermining also sources of its *discernibility* from others, which are according to modern versions of PII its predicates, including relations.

Nevertheless, this monad is genuinely *individual*. It is individual through and through: its complete concept is entirely individual, consisting of entirely individual predicates, properly definable only by individual definitory terms, and so on *ad infinitum*.

However, only an infinite mind could fully grasp the complete concept – or even its single attribute or a single definitory term of the attribute. The task for us finite minds is not to *identify* a particular substance: identify it within its various representations, identify the complete concept, identify at least some of its attributes – all of which is beyond our reach. Rather, our task is to individuate it within a perpetual flow of the worldly stuff, individuate its concept, individuate some of its attributes. That is why Leibniz omits talk of predicates and opts for notions of resemblance, similarity, discernibility in his definition of PII.

Conclusion

A lesson to be drawn from these reflections is of a systematic nature rather than merely hermeneutical. I believe that by delving deep into Leibniz's reasoning and reconnecting this with modern reappropriations of his thought, I have discovered an original notion of *individuality without identity*. Ontologies without this notion might have satisfactorily accounted for ideal things but I doubt that they are fit to account for individuation of real objects. On the other hand, I have got no idea of how to make the concept more precise by giving it a formal definition – and I, moreover, suspect that it is the fundamental presuppositions of all formal logical reasoning which preclude the concept to be thus definable, as hinted at earlier in the text. If this be so, then the sole merit of these enquiries might turn out to be merely therapeutical, showing certain limitations imposed on all formal ontological approaches, rendering

81 Ibidem, pp. 325, 457, 493, 577.
82 Ibidem, p. 599.

these even less apt to do their job than ordinary thought. However, if I am wrong on this part, I will be more than happy to see somebody take up the gauntlet and come up with a logic of genuine individuality.

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Abstrakt

Individualita bez identity
Článek zavádí pojem individuality bez identity, aby s ním nově nasvítil úskalí standardního pojetí identity. Pojem se inspiruje Leibnizovou původní verzí principu identity nerozlišitelných a umožňuje chápat tento princip způsobem, který vylučuje jeho moderní formálně logické čtení. Navíc je koncipován jako pojem komplementární k pojmu identity bez jednotlivosti, který byl v posledních 70 letech často diskutován vzhledem k jeho potenciální aplikovatelnosti na subatomární částice. Entity bez individuality se ukázaly být, spíše než pouhé chiméry, základními ontologickými jednotkami našich fundamentálních vědeckých teorií. Pokud to není libovolné, jak se domnívám, a existují systematické důvody pro to, aby se jakákoli teorie nakonec opírala o základní entity bez individuality, jsou naopak individua bez identity systematicky vyloučena z jakéhokoli vědeckého slovníku. Proto se oba pojmy nemohou ve svém teoretickém významu doplňovat, neboť význam druhého z nich nevyhnutelně zůstane pouze terapeutický, označující to, co bylo z našich teorií vyloučeno, transcendentální rozdíl mezi teoretickou, systematickou reprezentací a jejím předmětem.

Klíčová slova: Identita, individualita, rozlišitelnost, princip identity nerozlišitelných, nekonečná analýza.

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