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Identity, Individuality and Indiscernibility: an Essay in Analytic Ontology

Tamoghna Sarkar[1]

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Abstract

Objective This paper explores the interrelation among the concepts of identity, individuality and indiscernibilty, primarily from the standpoint of contemporary western analytic ontology and logic.

Method I review, compare and evaluate the classical and the alternative approaches to identity. In this regard, I focus on the issue whether these purportedly alternative approaches do really provide us with alternative conceptions of identity, or they are considering some other forms of equivalence relations weaker than the relation of identity. Arguments for and against the Principles of Indiscernibility of Identicals and Identity of Indiscernibles are delineated to unravel the connection between identity and indiscernibility. Various attempts to provide the definition of identity in terms of indiscernibility have also been evaluated.

Findings I argue that it is a verbal issue whether we use the term 'identity', when analysed in terms of indiscernibility, or 'congruence', but the underlying metaphysical issues are not simple. If identity is analysed in terms of indiscernibility, stipulation of one's philosophical understanding of property and possession of properties in the concerned logic and ontology should be made in clear terms to avoid confusion. But there can also be ontological and logical frameworks where numerical identity and difference are not qualitatively explicable.

Conclusion A pluralist stance, at least at the phenomenal level, is proposed to be maintained with regard to the explanation of the phenomenon of identity. This pluralist stance has also been proposed as a plausible metatheoretical framework of metaphysical debates.

✉ Tamoghna Sarkar
tamoghna81@yahoo.co.in

[1] Department of Philosophy, Lalgarh Government College, West Bengal Education Service, Medinipur, West Bengal 721516, India

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Introduction

The word 'identity' expresses diverse human experiences. We often tend to use the word or its correlates without much care and precision. Not only unreflective persons but also persons with philosophical reflections often conflate these wide variety of experiences with each other and misapprehend that they are using the word 'identity' or its correlates in a single sense. Let us consider the following usages: 'This statue is identical with itself now', 'This statue in the junction today is identical with the statue in the junction yesterday', 'These two statues have identical colour', 'This statue is identical with the lump of clay of which it is made', 'The statue and the statue without its hand are the same', 'The reassembled statue is the same as the original statue', 'This (statue) is identical with the statue', 'The statue and the statue of Aristotle are the same', 'The statue and the coloured-statue are identical', 'Water is identical with H_2O', 'Oil and wine are the same fluids', 'Cicero is identical with Tully', 'Rabindranath is identical with the author of Gitanjali', etc. These usages or experiences underlie various metaphysical, logical and semantic layers in the notion of identity, at least for those who believe in such a notion. Philosophical responses aiming at explaining these experiences themselves vary considerably. From the claim that all of these usages can be expressed without the notion of identity, to some of these usages are not of identity, to the claims that these usages can be explained by maintaining distinctions between strict and loose senses of identity, numerical and qualitative identity, necessary and contingent identity, determinate and indeterminate identity, absolute and relative identity, or even between perception of identity and verbal understanding of identity; responses cover a wide range crossing through the fields of metaphysics, logic and mathematics, language, and epistemology. Whether any talk or expression of pure identity without hinging on any sort of duality is possible or our understanding of identity is always imputed by the notion of difference, is a related point of concern.

Classical Identity and Its Alternatives

Western classical theory of identity encompasses either the concept of identity as introduced in the first-order logic or language or as it is employed in the higher-order languages. In first-order extensional language or logic, identity ('=') is commonly introduced as a binary predicate satisfying the laws of reflexivity and unrestricted Indiscernibility of Identicals (In.Id.).[1] Other classical formal features of identity, i.e. symmetry and transitivity, follow from the above two principles taken

[1] Reflexivity: For all x, x is the same thing as x. Indiscernibility of Identicals (intuitive version): If x is numerically the same with y, then x and y share all the same properties. Or if x is identical with y, then x is F if and only if y is F, where 'F' is interpreted by specifying the intended replacements for this letter. Sharing all the same properties or complete indiscernibility is often termed as 'qualitative identity'.

together.[2] From these features, some additional classical characteristics or principles of identity follow. The first is the necessity and permanence. Identity holds necessarily and permanently. If *x* is the same thing as *y*, then *x* is necessarily the same thing as y. That is to say, if *x* and *y* are identical in one world, then they are identical in all worlds in which they exist. And if *x* is the same thing as *y*, then *x* is always the same thing as *y*. That is to say, if *x* and *y* are identical at one time, then they are identical at all times at which they exist. So, identity is a non-contingent and non-temporary relation. Next, the determinacy of identity. It is never indeterminate whether *x* is identical with *y*. There is always a determinate fact of identity. However, it does not exclude the possibility of being epistemically indeterminate whether *x* is or is not the same as *y*. Then, there is the absoluteness of identity. If, for any *f* (fundamental thing-kind or sortal), x is the same *f* as y, then x is identical with y. '*x* is the same *f* as *y*' is short for '*x* is *f* and *y* is *f* and x is identical with y'. Given In.Id., the absolutist and sortalist version of identity asserts that if x is the same *f* as y and y also belongs to *g* (another sortal), then x is the same *g* as y. The absoluteness of identity ensures that when we ask whether *a* is the same as *b*, we must be ready to ask what *a* is and what *b* is.

These classical characteristics of necessity and permanence, determinacy, and absoluteness of identity do not remain unchallenged in the contemporary Western analytic tradition. Alternative conceptions of contingent and temporary identity, indeterminate identity and relative identity have been proposed challenging necessity and permanence, determinacy, and absoluteness of classical identity, respectively. Since the principle of In. Id. is, directly or indirectly, behind these classical characteristics, challenging the principle is common to almost every challengers of the classical conception of identity.

Strong version of the relative identity (SRI) (Geach 1962, 1967; Griffin 1977) maintains that identity under a sortal concept does not entail indiscernibility, and therefore, x and y could be the same under a sortal but distinct under another sortal. There are *only* or *merely* RI relations which are also equivalence relations not satisfying unrestricted In.Id. Geach in course of his denial of absolute identity claims that a two-place predicate satisfying reflexivity and In. Id. in a given theory expresses nothing more than mere indiscernibility and indiscernibility is always language relative. That is why, Geach claims that there cannot be any expression of absolute identity.[3] Identity can be expressed only relatively, and there is plurality of relative identities. Each and every clause that makes a relational expression of identity is an inseparable part of the whole expression. Since 'the same' is merely an index for a certain sort of relation, we cannot explain the two-place relational predicate 'is the same *f* (sortal) as' in terms of monadic predicate 'is an *f*'. We cannot split up 'is the same *f* as' into 'is an *f*' and then 'is the same *f* as'. This way of

[2] If *x* is numerically the same with *y*, then *y* is numerically the same with *x*. This is symmetry of identity. If *x* is numerically the same with *y* and *y* is numerically the same with *z*, then *z* is numerically the same with *x*. This is transitivity of identity.

[3] Geach accuses Frege, Russell and Quine for toying with the concept of mere indiscernibility in the name of absolute identity. There is nothing like absolute identity, claims Geach, over and above indiscernibility and the only 'real' identity is relative identity. Especially, he attacks Quine who explicitly takes indiscernibility as analysing, if not defining, identity of a given kind.

splitting up presupposes the truth of the principle of (unrestricted) In. Id., but the thesis of sortal-relativity of identity claims that identity under a sortal does not entail indiscernibility, and therefore, x and y could be the same *f* but different *g*s; x and y are only relatively identical. RI and In.Id. are incompatible.

Absolutists like Wiggins (2001) do not deny that there can be relative equivalence relations, but they reject the claim that those relations are relations of identity. 'Real identity', for him, is always absolute. Even if one prefers to term relative equivalence relation as relative identity, yet the advocate of relative identity cannot simply reject any form of In.Id. which is explicative of our intuitive and normal understanding of identity. It is nonetheless entailed by, if not entailing, our ordinary conception of identity. So if sortal-identity is identity nonetheless, absolutists maintain, it must adhere to some form of Leibnizian principle. Thus, for the relativist who wants to maintain that the 'same *f*' expresses more than a mere (absolute) equivalence relation, the apparent way out is clear enough: since it is the unrestricted usage of In.Id. that threatens the RI position, a relativist must find a way to weaken or restrict the Leibnizian rule in a manner compatible to his position. The traditional laws of identity has already been modified by the absolutists in order to accommodate the introduction of sortals, just like Wiggins restricts reflexivity and In.Id. Even if the relativist, in the end, may have to propose greater modifications, this, in principle, should not be objectionable. Though Wiggins is pessimistic about the project, efforts have been made to restrict In.Id in order to exercise the possibility of identity being relative.

The soft version of RI (FRI) (Deutsch 1998) does not altogether abandon the principle of In. Id., but it offers restricted indiscernibility principle so as to bear the burden of identity-claim of the relativists. According to this version, there is relative identity as well as absolute identity. Relative equivalence relations satisfy a restricted form of In. Id. and model themselves in the theory of general similarity. '*x* and *y* are the same book' is the expression of identity where 'book' is a common noun representing a kind of thing. On the other hand, '*x* and *y* have the same colour', for example, is the expression of general similarity where 'colour' is a common noun representing a kind of properties of things. So, sameness relations can be relativized to a sort of quality (e.g. same colour or same height) or they can be relativized to a sort of thing (e.g. person or statue). 'The same book' expresses unity of a single thing. That is why it is termed 'identity', whereas 'the same colour' expresses general similarity. The soft version claims that RI is a coherent idea if it is characterized by the logic of general similarity. The challenge for the FRI theorists, then, is to explain the fact that being similar in *one* respect (for example, the respect denoted by 'is the same cat as') entails being similar in so many other respects, in an entirely predictable and systematic manner. Thus, the FRI theorist bears the responsibility of offering a restricted indiscernibility principle so as to assert that if *x* is relatively identical to *y*, then though not all types of properties of *x* but every *φ*-property of *x* is a property of *y*. The '*φ*' must be filled in such a way that it will account for all the metaphysical contexts like synchronic and diachronic identity, constitution, etc. for which FRI is intended to yield an analysis. This version of the restricted indiscernibility principle assures that relatively identical objects must share all those properties which, if instantiated by any members of a particular

equivalent class, must be instantiated by all the members of that class. In general, a property is preserved by an equivalence relation if it is the case that if one member of the class has the property, then every member does. For example, consider the equivalence class consisting of all the numerically distinct objects (absolutely distinct) which are the same cat as C. The φ-properties with respect to this equivalence class are those which satisfy the condition: if one such 'C-object' has the property in question, then they all do. Any instance of the FRI presupposes that x and y are absolutely or numerically distinct. But absolutely identical objects can not differ at all. In other words, strictly distinct objects may be the same *f* but strictly identical objects cannot be different *g*s. Strictly identical objects cannot differ, for example, in size. But just as strictly distinct objects may have the same size, so, strictly distinct objects may be the same book, statue or water. The weak view asserts that 'there are predicates F such that if x and y are the same F, then, for any equivalence relation, E, whatsoever (whether or not an identity relation), $E(x,y)$' (Deutsch 2007). This last condition implies that the relation *x and y are the same f* satisfies a restricted form of In. Id.

Contingent identity (CI) theorists claim that certain identities can be contingent, and the principle of In.Id. does not apply to modal properties such as necessary identity.[4] *Being necessarily identical to a* (a is proper name) is not a property and that is why In. Id. fails to apply in this context. Gibbard (1975) in his famous defence of CI constructs a case involving a particular clay statue and the lump of clay to show that their relation is of CI. Suppose that a particular clay statue (named 'Goliath') is composed out of a piece or lump of clay (named 'Lumpl'). Suppose further that Goliath and Lumpl came into existence and pass out of being at the same instants of time. So, it can be said that they are identical in the sense that they are coincidents, i.e. having the same spatiotemporal extent. Gibbard presupposes this coincident identity thesis. But again suppose a situation (possible world) in which before they have gone out of existence the statue is dropped and shattered into pieces or it might have been rolled into a ball. Then what happens to their identity? In that case, the statue is destroyed but not the clay. Lumpl outlives Goliath. Goliath is identical to Lumpl in the actual world but distinct in some other possible worlds. So long as Goliath and Lumpl are coincidents having the same spatiotemporal lifespan, they are identical, but since it is possible that Lumpl would still exist even when Goliath would cease to be, they could not be necessarily identical. Although Gibbard repeatedly emphasizes that identity in CI theory should be taken as strict identity in the sense of complete coincidence, this identity could have been changed into non-identity in another possible world or at other times. He

[4] Kripkean challenge (Kripke 1980) to the contingent identity theorists is twofold: the first is to find identity statements containing rigid designators that can be contingently true, i.e. true in the actual world but false in some other possible worlds because rigid co-designators might have referred to two distinct individuals instead of co-designating the same individual in all other possible worlds, and second is to show that there are ontological instances of contingent identity relations. Gibbard does not disagree with Kripke's analysis of Hesperus=Phosphorus as a necessary truth which cannot be known a priori. But he holds that there are counterexamples to Kripke's claim that *all* true identity statements between proper names are necessary. Gibbard maintains that Kripke has transformed but not eliminated the subject of contingent identity. The solution to certain persistent metaphysical puzzles lies in accepting that certain identities are contingent.

also refuses to consider modal predicates like *being necessarily identical to Lumpl* as expressing genuine property. Modal properties, for him, are not properties of individuals and hence are excluded from the purview of In. Id.

The supporters of worldly or ontic indeterminacy of identity also do not consider *being indeterminately identical with a* as expressing a genuine property. The consideration of ontic vagueness provides a new dimension to the characterization of identity relation. This consideration may take various forms. Some maintain that the mere possibility of the existence of (individuatively) vague objects guarantees that they posses vague identity. Another group of philosophers holds that there can be vague objects without vague identity. Yet another sub-variety maintains that there are no vague objects in the standard interpretation of the term, rather there are only indeterminate states of affairs or worldly indeterminacy. A section of the supporters of worldly indeterminacy accept indeterminacy in property–possession as well as indeterminacy in identity: there is indeterminacy in whether an object possesses a certain property or not and sometimes there is no fact of the matter whether a pair of objects is one and the same thing or different things (Parsons and Woodruff 1995; Parsons 2000). When expressed in terms of genuine properties and relations, worldly indeterminate identity (WII) theorists claim to accept In. Id. but reject its contrapositive by which opponents try to prove non-identity from indeterminacy. In classical logic, In. Id. and its contrapositive are equivalent. But if there is a possibility of truth-value gaps, inferences using the contrapositive of In. Id., i.e. if some property φ is a property of x but not of y, then $x \neq y$ are not always valid. *Indeterminate-A* does not invariably imply *Not-A*.

WII theorists maintain that any theory that allows for indeterminacy in the world must place constraints on how language might relate to the world. Even if a language has the syntax of the predicate calculus with identity and that in this language predicates can be formed by lambda abstractions, such as the predicate of *being indeterminately identical with a* $[\lambda x\,[\nabla(x = a)]$, one cannot assume without restriction that any such abstract refers to a property and also satisfies the abstraction principle that $F(a)$ is interchangeable with $\lambda x\,[F(x)](a)$. WII theorists argue that Evans's argument (Evans 1978) and all arguments influenced by it beg the question by assuming without argument that such abstracts automatically stand for properties and that they simultaneously satisfy the abstraction principle. Parsons holds that this assumption must be rejected by any proponent of indeterminate identity. In the case of identity, the issue of how identity behaves in the world is not a conceptual matter, it is an ontological one. So assuming that a property abstract is meaningful does not invariably imply that it stands for a property. If there is ontic indeterminacy whether a is identical with b, then predicate such as *being indeterminately identical with b* fails to express a genuine property.

The question is whether the challengers of the classical view of numerical identity are really talking about identity rather than some other weaker equivalence relation. Most of the challengers naturally claim that they are concerned with actual identity, the two-place equivalence relation satisfying reflexivity and the principle of the In.Id., otherwise they would miss the point of debate.[5] Apart from Geach,

[5] The phenomenon of qualitative change apparently poses a threat to the In.Id. Things change through time. The concern is whether qualitative change in an object amounts to the loss of identity of that object

who claims that there are *only* relative identity relations which are also equivalence relations not satisfying the In.Id., all other challengers take a two-pronged strategy: either impose a completely general and systematic constraint on the In.Id. or uphold the unrestricted version of the principle excluding some troublesome contexts from its reach by claiming either that these contexts do not determine properties or even if they express properties, these are not under the scope of the principle. Deutsch provides a restricted indiscernibility principle to bear the burden of identity-claim of the relative identity. While CI and WII theorists, in defending their theses of contingent identity and indeterminate identity, respectively, hold that the contexts like *being necessarily identical to something* and *being indeterminately identical to something* do not express worldly properties, so as to exclude them from the purview of the principle. But this strategy itself is not beyond suspicion. Both Gibbard and WII theorists can be accused of being blatantly arbitrary. They exclude only those contexts which are in possible conflicts with their accepted views. They both are begging questions in so far as they presuppose their views and reject all other contexts which do not comply with their positions. Deutsch's restriction of the principle is methodologically less suspect, but the restriction based on general similarity does not invariably guarantee indiscernibility of the class of objects unified by a similarity relation. Theories of contingent and occasional identity also result from grounding identity on similarity. We cannot deny that the idea of similarity unites the various senses and conceptions of sameness. But most of the alternative conceptions of identity presuppose that the desired indiscernibilty can be achieved from the similarity relation, interpreting identity in terms of indiscernibility. The standard conception of identity also introduces identity in terms of indiscernibility and the notion of similarity unites its various senses or layers. But the standard conception does not ground indiscernibility on similarity. Herein lies the distinction between the standard and most of the alternative conceptions of identity. The goal for both the standard and alternative conception is to account for certain metaphysical phenomena and explain various experiences and usages of identity. It is a verbal issue whether we call those experiences and usages that they are of 'identity', but the underlying metaphysical issues are not verbal.

Footnote 5 continued
in the sense that either there is numerical difference or the object is completely transformed into something else. The Principle of the In.Id seems to function as an enthymeme in creating this concern of preserving diachronic identity through qualitative change. There are many strategies adopted by philosophers to save the principle from this apparent threat. Most popular strategies have been the relativization to time in which the principle reads: $x = y \rightarrow (t)\,(F)\,(F_t x \equiv F_t y)$. There are many possible interpretations of $F_t x$ (x is F at t): (a) x is F-at-t (considers monadic properties as disguised relations to time) (b) x-at-t is F (considers object as four-dimensional and contrary intrinsics are successively possessed by the temporal parts of a persisting four-dimensional object) (c) at-t (it is true that) x is F (treats 'at t', not as a qualifying term but as a *sentential temporal operator*) (d) x is-at-tF (considers 'at t' as a predicate modifier or adverb). Aristotelian metaphysics also preserves the principle by holding that ordinary objects undergo intrinsic change by successively entering into distinct accidental unities thus having incompatible properties only derivatively but not *simpliciter*.

Indiscernibility and the Definition of Identity

In the Fregean development of symbolic logic, which is often termed as 'standard', we can alternatively think of a 'classical' second-order logic (or a higher-order logic), which allows, not unanimously though, for a *definition* of identity in terms of indiscernibility, namely $x = y =_{df} (F)\ (Fx \equiv Fy)$, where x and y are individual variables and F is a variable for properties of individuals. This purported definition assumes both the principles of In.Id. and Identity of Indiscernibles (Id.In) as valid, at least methodologically and intuitively. The claim is that the In.Id guarantees just the necessary condition for identity, while the Id.In. provides the sufficient condition for it (Wiggins 2012). Conjunction of these two principles is called the 'Leibniz Law' (LL) and often suggested as *defining* identity. Principles of Id. In. and In. Id heavily depend on the notion of property. Controversial Principle of Id.In has often been taken as the guarantee to the fact that there cannot be two or more individuals having all relevant properties in common, especially space-time points. The principle can be captured by the slogan: No numerical difference without a qualitative difference. To get a metaphysically serious version of the principle some sort of restriction should be maintained so that the trivializing properties like that of identity-properties are excluded yet qualitative difference of numerically distinct objects is retained. Qualitative difference may be formulated with respect to intrinsic or 'state-independent' properties or with respect to extrinsic or 'state-dependent' properties. But more you restrict the scope of the property-variable more is the possibility of the principle to become false. Thus, it can be shown to be contingently false by examples of two objects having a common set of relevant properties.

Second-order logic is required to characterize and quantify over properties (property variables), thus formulating the LL or defining identity. But there is no complete calculus for second-order logic. Moreover, second-order variables often range over intensional entities. That is why, many logicians including Quine found second-order quantification problematic.[6] First-order logic does not straightforwardly allow quantification over property variables unless one is ready to admit properties as one type of entities in the domain of interpretations or admit substitutional quantification. To deal with properties in first-order logic and in a purely extensional setting, we can characterize identity in a Quinean way, presupposing the fact that finite agents are able to access only a restricted set of properties. Quine asserts that in first-order logic identity can be included as a logical constant but then we need not treat identity as a primitive simple predicate. At least this is so for any theory T that has a finite lexicon of primitive terms. In such a theory, Quine argues that $x = y$ will be an abbreviation of a complex sentence, and thus, identity is eliminable in favour of a complex predicate construed by exhaustion of all the primitive predicates of the theory (Quine 1970). Suppose a formula A(x, y)

[6] Frege in his *Grundlagen* accepts LL, as formulated in second order language, as defining identity. In *Grundgesetze*, he takes it as an axiom. Russell and Whitehead also takes LL (with some notational variances and using material implication in the *definiens*) as defining identity although they restricted their definition to the so-called predicative properties (predicative propositional functions), so that the application of identity in their system depends on the axiom of reducibility.

as the conjunction of all possible substitutions in the predicates of the language, in a sense that there is an exhaustion of all the primitive predicates of the theory. Then, identity between x and y ($x = y$) is characterized by such a formula. For instance, suppose that the only primitive predicates are the binary predicate P and the unary predicate Q. Then, $A(x, y)$ should be the following formula (except for the quantifiers):

$$(P(x, z) \equiv P(y, z)).(P(z, x) \equiv P(z, y)).(Q(x) \equiv Q(y))$$

which 'simulates' identity for x and y as long as x and y share all the primitive predicates of T (Hilbert and Ackermann 1950). According to it, given a finite number of predicates, objects x and y are indiscernible by those predicates. Even when they are in relations to other objects, say z, they remain indiscernible. Still, Quine's proposal does not provide anything beyond indiscernibility in limited respects.

If objectual identity is understood in terms of indiscernibility, then, how can we differentiate identity from congruence? Congruence is also an equivalence relation that obeys indiscernibility principle. Relata of congruence relation, in a given class of properties, share all their properties. LL (as formulated in first-order logic) in fact axiomatizes a congruence relation which we can call 'Leibniz congruence'. If we take identity as a logical constant and introduce identity in terms of indiscernibility, then actually we are letting identity to merge into congruence. In logic and mathematics, congruence is usually contrasted with identity. Roughly speaking, x and y are congruent relative to a class C of properties if and only if for every property P in C, x has P and vice versa. Often the class C is implied by the context, for example C here is the class of properties expressible in some given vocabulary. If C is the class of all properties whatsoever (including location properties and properties like that of *being Ram*, etc.), then congruence relative to C is equivalent to identity. If C is some restricted class, then congruence relative to C does not imply identity, e.g. if C is the class of shape properties, then congruence relative to C is just sameness of shape. Of course, identity implies congruence relative to a given class of properties. In first-order logic, congruence plays the same inferential role as that of identity. But congruence relation most of the times does not express identity. For example, a relation, say, *being paired with the same intension* is a congruence relation but not identity (Chatterjee 1998). But, probably, the logicality of identity cannot be restored without its being interpreted as Leibniz congruence. If a material equivalence relation satisfies the substitutivity principle or the principle of In.Id., then all that we get is identity in the sense of Leibniz congruence. It is a terminological issue whether an equivalence relation satisfying unrestricted indiscernibility Principle be called 'congruence' instead of 'identity'. Although it is a verbal issue how to use the words 'property' and 'congruence' and whether total indiscernibility of properties be called 'congruence' instead of 'identity', the underlying logical and metaphysical issues are not verbal.

Many among those philosophers who consider that self-identity or trivial identity does not require any grounding principle generally distinguish Leibniz congruence or identity as a logical constant from the self-identity which is primitive and indefinable.

Those who want to distinguish Leibniz congruence from trivial identity or self-identity, i.e. the relation in which every element is related to itself and nothing else, must take trivial identity as an indefinable primitive notion and not a logical constant. They should maintain that strict identity or self-identity is not conferred by or grounded in anything, and therefore, there is no question of conferring any 'Principle'. Many philosophers' take on identity seems to lack the specification of what they are talking about, trivial identity or Leibniz identity. This, in turn, creates many a confusion. Any attempt to define trivial identity would involve property which presupposes trivial identity itself. Hence, any attempted definition would be circular. Individuation in terms of properties presupposes strict identity. When we say that a has a property F, we are already individuating a. And this in turn requires the possibility of identity judgments. To decide that $x = y$, we will have to decide that x and y share all their properties, and this latter decision cannot be made unless we already know in advance what sort of thing x and y each is. Proposal of a hierarchy of identities in which an identity determines a property of the same level and a property determines the identity of the next higher level would be of no help to break the circle. For an understanding of identity still remains basic. Quine's suggestion of adding predicates to the list so that identity for a kind or sort is adequately simulated would at best provide identity conditions for *that kind* only. Take, for example, material objects as the values of the variables of *T*. Where our stock of primitive predicates of T includes n predicates except spatiotemporal similarity, we can hardly take indiscernibility in n respects for x and y in T to count as identity for x and y in T. By adding spatiotemporal coincidence to our list, on the other hand, identity would be sufficiently simulated, only because spatiotemporal coincidence is exactly what is appropriate for material object identity, at least for the supporters of coincident identity thesis. Thus, an attempt to define identity in terms of LL violates the non-circularity requirement of a definition even if we set aside controversies over the principle of Id.In. (Savellos 1990). But even a primitivist would admit that LL is explicative of our normal or intuitive understanding of identity because LL is entailed by but not entailing our ordinary understanding of identity. Thus, understanding LL is a necessary condition for our understanding of identity. Even if the general notion of trivial identity is primitive, we can use our primitive notion of identity to define identity for objects of specific ontic kinds, say, persons, events, material objects, etc., for we now say something extra for the objects for which it holds. Thus, a primitivist about identity embrace the view that identity is simple and the so-called problems or puzzles associated with identity are not at all problems about identity rather they are problems about property–possession of objects or of coincidence or about concepts whose extensions are far narrower than the field of identity, like the concepts of being a ship or a person (Akiba 2000).

Individuality and Indiscernibility

A traditional approach to the notion of individuality reveals that an entity is an individual if it obeys the rules of the classical theory of identity. Discernibility or distinguishability and indiscernibility or indistinguishability are generally understood by means of properties. So if individuals obey the classical theory of identity,

we can say that individuals are distinguished from one another by means of differences in the properties of the entities or for having a certain peculiar property and it seems quite reasonable to suppose that these qualitative differences also provide the basis for respective individualities of entities. But what confers individuality to an entity depends on the particular framework in which the concepts of entity and property are defined. And it is not always the case that properties are taken to confer individuality. It is generally agreed that so-called everyday objects such as trees, books, chairs, mobiles and people can be regarded as individuals. It is also classically agreed, as we have indicated, that self-identity provides the basis for object's individuality. In fact, an individual is conceptually tied to its identity with itself in a manner it is not with other relations. Although in what consists, self-identity does not provide a unanimously agreed answer. Questions arise as to whether it is a property or, more specifically, a relation; if it is so whether it is a quality or a non-qualitative property; if it is a non-qualitative property whether it is a unique essential property in the sense of *haecceity* or primitive thisness or there are many individual essences of an object and self-identity is just one of them. The notion of self-identity or 'strict' identity is generally taken as synonymous with the notion of numerical identity, by which an object is counted as one.[7] Counting through numerical identity then can be considered as a further condition for individuality, if individuality is conceived in terms of self-identity at all. Then, we can characterize an individual as an object that is determinately distinct from others of its kind so that this plurality is countable and each member of such a plurality counting for just one, a unit of its kind. So an individual object should have determinate identity condition and to specify conditions of numerical identity just is to specify the conditions of individuation.

One can argue, then, that the lack of self-identity makes something non-individual. A paradigm of which, as has been generally argued, are quantum particles. This notion of non-individuality can be captured in the quantum context by formal systems like 'Schrödinger logic' where reflexivity is not a valid law (Schrödinger 1995). So, standard conception of identity cannot be applied to quantum particles. Non-individuals are objects which do not obey the classical theory of identity. But non-individuals can exist in the sense that they can well be values of variables. This sort of idea can be said to be anticipated by Wittgenstein. He expressed his distrust both for self-identity and the definition of identity in terms

[7] Aristotle admits a possibility of numerical sameness without strict identity. To be a hylomorphic compound is to be an individual and to be an individual is to have the identity in the sense of *being*. It is not to say that non-individual matter, for Aristotle, is not a being. Obviously it is, and not only that accidental unities like seated-Ram also has being or identity. Identity in the sense of *being* is taken as a relation, which everything has with itself. In case of individuals, this sense of self-identity or strict identity is construed as indiscernibility in all respects. In case of individuals, strict identity entails but is not entailed by numerical oneness or numerical sameness. Each having its own (strict) identity is different or not (strictly) identical to other beings. Thus, matter is different from individual; a substantial unity is different from another substantial unity as well as from an accidental unity, etc. However, a substantial unity is numerically the same or counted as one or non-distinct from the accidental unity having the same matter as long as they both exist. Here we do not have strict identity or absolute indiscernibility but there is numerical sameness. In this sense, numerical (non-strict) identity or numerical sameness requires sameness of matter at a time.

of indiscernibility. The objects which violate the definition in the sense of sharing their properties without turning to be the very same object can be (formally) considered as non-individuals. Schrödinger's idea is also that the relation of equality cannot be applied to non-individuals, in the sense that expressions of the form $x = y$ are not formulas of the considered language. Thus, in particular the property 'being identical with a', for a certain term 'a', cannot be considered among the properties of the object a. Of course, then, non-individual entities or entities without identity can be values of variables, not of the classical theories of identity, but of a metalanguage that speaks about the considered object theory. We need metalinguistic or metamathematical framework for a formal description of non-individuals (French and Krause 2006). But there is an alternative way to look into the matter in which it has been argued that quantum particles can be regarded as individuals but possibly at a price of accepting a non-standard metaphysics of relations and properties. Exploration of the debates concerning identity and individuality in the world of subatomic quantum particles is beyond the scope of the present essay. Instead we tend to conclude this matter, following French and Krause, that there is a stronger form of underdetermination of metaphysics by the physics when it presents us with two compatible packages: one in which particles are individuals and one in which they are not.

Returning to the question as to what confers ontological individuality to a particular entity, we find at least three answers in the literature. First alternative is to assert that individuality, along with identity and distinctness, is primitive. It is not conferred by or grounded in anything, and therefore, there is no question of conferring any 'Principle'. On the other hand, it may be asserted that individuality of a particular item consists in *something* peculiar to that item. This *something* may be some subset or 'bundle' of the properties of that item, it may well be a single exclusive property of it; or there may be something 'over and above' these properties that confers individuality to that item.

So, the second alternative is that individuality is conferred by some subset of the properties of that item that is peculiar to that item. But what makes those properties (or a single property) peculiar to that item? In other words, there must be a principle to ensure that no other object could possess that particular set of properties. Leibniz's Principle of the Identity of Indiscernibles (Id. In.) has often been taken as the guarantee to the fact that there cannot be two or more individuals having all relevant properties in common, especially space–time points. The principle has also been put forward by its supporters as providing the sufficient condition of identity and individuation. We will now have a closer look at that principle.

In its simpler unqualified version the Id. In. asserts that if things differ numerically, they also differ qualitatively, i.e. they are discernible or distinguishable. The principle claims that there cannot be any numerical difference without a qualitative difference. Qualitative difference may well be with respect to intrinsic properties or with respect to external or relational properties. So, when difference is captured in terms of properties, the domain of the properties over which one quantifies is a crucial consideration. Thus, we get at least three versions of the Id. In. depending on the range of property-variable:

P_1 No two things possess all their properties in common.
P_2 No two things possess all their extrinsic or relational properties in common.
P_3 No two things possess all their intrinsic or monadic properties in common.

P_1 is the trivial and weakest version of the principle. Identity-properties make P_1 trivially true. Consider an identity-property *being identical to a* (A). If one quantifies over all properties, P_1 is true because if any things *a* and *b* share all their properties, including (A), then they are identical and so they are not *two* things. First, assume that *a* and *b* share all their properties. From the general law that everything is self-identical, it follows that *a* has the property of *being identical to a*. So, *b* also has the property of *being identical to a*. But if *b* has the property of *being identical to a*, it follows that *b* is identical to *a*. Hence, if *a* and *b* are indiscernible, they are identical; that is, P_1 is true. This argument for the Id.In. clearly makes the denial of the Id.In. into a contradiction, since denying it would amount to saying that there are two, that is, distinct or non-identical particulars that share all their properties, including their identity-properties, and therefore, non-identicals are identical (Rodriguez-Pereyra 2006). Note that the argument, taken in itself, only proves that there is nothing indiscernible from *a*, not that there is no pair of indiscernibles. But, assuming everything is self-identical, this argument can be generalized. Moreover, there is another assumption that makes P_1 a trivial necessity. It is the impenetrability assumption according to which no two things can possess the same spatiotemporal location because they are impenetrable or, so to say, there is impenetrability in the 'stuff' or 'mass' of which objects are, in some sense, made or constituted.

Putative counterexamples to the Id. In. thus are not against P_1 as formulated above; they are in general against the formulation that things which are indiscernible *in some specified respects* are identical. The more you restrict the scope of the property-variable more is the possibility of the principle to become false. Thus, P_2, P_3 can be shown to be contingently false by examples of two objects having a common set of relational properties or a common set of monadic properties. To get a metaphysically serious version of the principle, some sort of restriction should be maintained so that the trivializing properties like that of identity-properties are excluded yet qualitative difference of numerically distinct objects is retained (Rodriguez-Pereyra 2006). Qualitative difference may be with respect to intrinsic or 'state-independent' properties or with respect to relational/extrinsic or 'state-dependent' properties.[8] Relational properties may depend on the identity of the *relatum* or they may be purely qualitative. Properties that depend on the identity of a *relatum* and analysed with reference to some particular substance, like *being three metres from the India Gate*, are often called *impure* properties. Those that do not depend on the identity of a *relatum*, like *being three metres from a tall gate*, are called *pure* properties. Since intrinsic properties do not depend on the identity of any *relatum*, they are generally classified as pure. Many metaphysicians

[8] The distinction between extrinsic and intrinsic properties is hotly debated in the literature. It is not so straightforward to equate extrinsic properties as relational. But for the present purpose the distinction is intuitively grasped as the distinction between state-independent and state-dependent properties. Any physical system can be in certain states and characterized by properties like velocity, energy. These are state-dependent properties. State-independent properties are those which are not state-dependent.

assert that only pure properties make a qualitative difference, only pure properties are qualitative in a sense. Their formulation of the Id.In., in a positive way, would read: If *a* and *b* share all the same (purely) qualitative properties, then $a = b$. Roughly, a qualitative property is the property of being a thing of a certain kind; a qualitative property can thus, in principle, apply to more than one thing. Further, a qualitative property is neither a property of being a particular object nor a property of being related to a particular object. So the property of *being identical with a* and the property of *being five feet from a* are not qualitative properties. This version of the Id.In. intends to cover both relational and non-relational qualitative properties.

Max Black's well-known conceivability argument by sketching a symmetrical universe with two indiscernible iron balls is often put forward as the counterexample to the above version of the Id. In. that shows that the principle cannot be necessary. The counterexample intends to show that a certain qualitative arrangement is possible and two distinct indiscernibles are responsible for that arrangement. Let us quote Black himself:

> "…Isn't it logically possible that the universe should have contained nothing but two exactly similar spheres? We might suppose that each was made of chemically pure iron, had a diameter of one mile, that they had the same temperature, colour, and so on, and that nothing else existed. Then every quality and relational characteristic of the one would also be a property of the other. Now if what I am describing is logically possible, it is not impossible for two things to have all their properties in common. This seems to me to refute the Principle" (Black 1952, p.156).

Black asks us to consider whether it is possible for there to be a universe that contains only two exactly homogeneous spheres located, say, four feet apart from each other. Each sphere is made of material that is qualitatively exactly like the material constituting the other sphere; each sphere has the same dimensions as the other sphere and moves (if it moves) in precisely the same way as the other. Further the two spheres have all the same qualitative relational properties. For example, each sphere is four feet away from another sphere, etc. If such a universe is possible, then we seem to have a direct counterexample to the Id.In: the two spheres are qualitatively indiscernible and yet they are *two*; they are not identical.

Arguing in favour of the Black's symmetrical universe Adams uses the possibility of two discernible but *almost* indiscernible spheres. The argument rests on an intuition:

> "…that the possibility of there being two objects in a given spatiotemporal relation to each other is not affected by any slight changes in such features as the colour or chemical composition of one or both objects. If we accept that intuition, we can infer the possibility of indiscernible twins from the uncontroversial possibility of *almost* indiscernible twins" (Adams 1979, p. 17).

Now, consider a possible world *w* at which nothing exists other than iron spheres *x* and *y* of a certain size and composition, but *x* has a small chemical impurity that *y* lacks. Otherwise they are indiscernible. If such a universe is possible, then it

would seem to be equally possible for there to be a universe in which x exists but without its chemical impurity; thus, the chemical impurity is not essential to x. It also seems possible that, in the universe in which x exists without the impurity, y exists just as it does in the original world, i.e. without any impurity. Let w' be a possible world at which x and y exist and are indiscernible. Given their non-identity in w, they must also be non-identical in w', a situation in which both exist. Thus, in this situation, x and y would be distinct, yet indiscernible, even though in the first situation they were discernible. If they were identical at w', then, by the necessity of identity, x and y were also identical at w, contrary to their being discernible at w. So, at w', x and y exist and are numerically *distinct* and indiscernible. World w' is thus a counterexample to the Id.In.

Adams not merely uses his counterexample to cast doubt on the Id.In. but also as a positive support to his version of Haecceitism or primitive thisness. Haecceitism is the thesis that individuals are individuated by their *thisness*, the property of being identical to a certain particular individual where this property is in no way reducible to qualitative properties. Adams understood primitive thisness in terms of the non-qualitative property of self-identity. Primitive thisness is not the property of being identical with some individual or other but the property of being identical with a certain individual. So there can be non-qualitative differences between (non-identical) worlds. It does make sense to ask, for the supporter of primitive thisness, whether *this* is the same individual in another possible world without reference to common attributes. Primitive thisness presents us with one of the possible candidates for the third alternative of what confers individuality: individuality is conferred by the primitive thisness that goes beyond the (qualitative) properties of the object. Other candidates for the third alternative include substance and fundamental unity.

Arguments against the Id.In. have been enormously influential, and consequently, it is extremely rare to find a contemporary proponent of the Id. In. Supporters of the Principle, in recent times, more or less agree that the Principle is not necessarily true but, they argue, it is not necessarily false either. It can be contingently true and even if no longer regarded as an a priori logical truth of the metaphysics, it may still be a useful methodological principle. It advocates quantitative parsimony which is a theoretical virtue: it is parsimonious to assume that indiscernible objects are (numerically) identical, unless there is reason to think that they are distinct. Numerical identity and difference must be qualitatively explicable. Mere numerical difference of numerically distinct things is not theoretically interesting. Thus, some supporters of the Principle claim that all counterexamples to the Id. In. involve qualitatively inexplicable ungrounded brute facts of identity and distinctness. They oppose to brute identity facts like that of *haecceity*, etc. which is involved in the third alternative. In putative counterexamples what makes two qualitatively identical spheres numerically distinct is not their qualities but rather their simply being distinct individuals. For the Haecceitist, they are distinct in virtue of their distinct thisnesses or *haecceities*. In either case, there is appeal to a metaphysical primitive truth. But acceptance of brute identity or distinctness facts, some supporters of the Principle argue, leads to unwelcome metaphysical possibilities like the possibility of distinct indiscernible objects that have all the same parts and are

completely overlapping and occupy the same location at all the same times. But we find that the necessity of identity or transworld identity condition does not necessarily require such brute facts and the Id. In. would be able to provide such condition only if objects have all their properties essentially, the position that is unacceptable to many. The undertone of this debate, as we have indicated, is connected with the age-old debate whether ordinary objects are nothing but bundle of properties they instantiate and that is all we can know about objects or it is something primordial or primitive transcending all properties. It is always about metaphysical frameworks and being consistent and coherent within a specific framework. We can maintain contingent truth of the Principle by providing motivation that qualitative difference is something more than differing numerically. But if we understand 'identity facts' in terms of non-modal facts about which object is which and no qualitative feature of objects fix which object is which, then the objects differ in which objects they are, without differing in any other respect. In this situation, the principle of the Id. In.loses its motivation.

Elimination of Identity and Concluding Remarks

The followers of Wittgensteinian logic (Wittgenstein 1961) claim that the adaptation of *Tractatarian* logic with its exclusive interpretation of variables makes the identity sign and with it the appeal to classical objectual identity as its semantic value, superfluous. All uses of the identity sign in first-order logic can be eliminated by adopting Wittgensteinian logic, without giving up any of the expressive power of $FOL^{=}$. Wittgenstein's proposal in the *Tractatus* involves fundamental revision of the syntactical rules for interpreting quantifiers and its variables. The change of variable by itself signifies change of object. Each free individual variable has an assignment which makes it such that its referent is distinct from every other free individual variable. So, according to *Tractatus*, identity must be *shown* in the formal grammar of an ideal language.

I maintain that the possibility of *eliminating* a principle by means of another convention or principle should not be encouraged if the elimination is based on the prior assumption that the accepted principle will explain away all alternatives. Different conceptions of identity have been put forward as the explanatory principle of certain metaphysical contexts, cognitive experiences and linguistic usages. The mechanisms behind those conceptions may be different, and it may well fairly be a stipulation what to call 'identity'. Strict demarcation of various relations may be left wanting but that should not be, in principle, a strong ground for rejecting alternative conceptions as far as they are internally consistent. Multiple approaches to explaining a given set of phenomena are acceptable when there are, for each principle or approach, strong empirical reasons and evidences to accept them.

If numerical identity is analysed in terms of indiscernibility, then one has to stipulate, for avoiding any confusion, her understanding of property and possession of properties in the concerned logic and metaphysics. One has to, for example, make clear whether 'genuine property' in her system means only worldly characteristics having ontological loading or it covers every features including modal ones and in

which respect indiscernibility is to be understood. Quine's analysis of identity in terms of indiscernibility shows this much that our attempt to add simultaneously more than one versions of identity to the predicate calculus, actually ends up with only one. He argues that in standard first-order logic any two identity predicates are provably coextensive. But it does not really follow, neither he argues, that there is a unique identity relation, for there may be interpretations of '=' which satisfy reflexivity and In.Id but do not coincide in all their attributions of identity. Thus, the question of so-called genuineness of identity largely depends on specified metalanguage containing its own identity relation. But there can also be metaphysical and logical frameworks where numerical identity and difference are not qualitatively explicable.

The fundamentality of the concept of identity in our system of thought is responsible for its overarching generality which in turn constitutes its deceptive simplicity. Setting the verbal or terminological issues aside, if a metaphysical system remains internally consistent while explaining a given set of experiences and linguistic usages, we should not demean it as devoid of any hinge of truth. The seeming interminableness of metaphysical debates, thus, should not be considered a vice. With this perspective, we should not hesitate to embrace a pluralist stance, at least at the phenomenal level, in explaining the phenomenon of identity. In a wider sense, it may be taken as a plausible metatheoretical framework of metaphysical debates. The pluralist stance I am proposing is a metatheoretical position in which each perspective to reality does not uniquely claim absolute truth or falsity since there is an underlying one-many correspondence theory of truth: a given sentence partly describes a fact following the perspective from which its content is described (Schang 2010).[9] There will be alternative logical values resulting from various combinations of truth and falsity inside the initial set of values T (for true) and F (for false). Additionally, these values have ontological imports. That is to say, it not only assumes that there are many reals but also that the reality itself is many-faceted that cannot be restricted to a unique predication (Ganeri 2002). Every entity is an organic and integrative synthesis of identity and difference. As finite human beings, we cannot empirically know each and every aspects of identity and differences of an entity. So, what we can assert is only a perspective or standpoint, each one, though partial, is true and valuable. It does not presuppose an ambiguous, uncertain character of the world or any kind of instability in meaning. Rather, partial truths are sufficient conditions of truth-assignment. These partial truths have to be stated conditionally by recognizing that the justification of a sentence is internal to a standpoint. In this sense, one and the same sentence can be taken to be both true and false depending upon the condition under which its content is assessed. A conditional, partial statement of truth is thus a metalinguistic statement rather than an object-linguistic one. Only when one aspect (a partial or conditional truth) is taken to be the whole (absolute truth), the statement becomes invalid. But the

[9] This position is inspired by the Jaina philosophical theories of non-one-sidedness, of perspectival character of knowledge, and of conditional predication. This position, of course, needs to be developed rigorously. For relevant textual discussion, see Vādidevasūri (1967, 1988), Mallişenasūri (2002), Hemcandra (1970). Among a large number of secondary literatures on Jaina logic, following papers are relevant to our present proposal: Ganeri (2002), Schang (2010), Gorisse (2009), Gokhale (1991).

pluralist stance is not to be considered as a mere conglomeration of 'half-truths' lacking proper synthesis and systematization, and making way to a form of eclecticism. The synthesis here does not imply obliteration of alternative truths and relegation to any non-dual absolutistic synthesis; rather it vouches for an integrative, organic synthesis of partial truths. It is a metatheoretical system of conditional truths in which predications of affirmation, negation, both affirmation and negation, individually or jointly, in different ways, occur to a certain attribute of an object in a certain context without any internal inconsistency. The language of such a system must have a way to talk about different logical systems, so that all of them can be incorporated into a single metalogical system. Conditional statements within this system are not incompatible with each other. Moreover, they should also be compatible with valid cognitions in the entire sphere of experience. So, the pluralist stance poses an open question whether any phenomenon or certain phenomena can be completely explained in terms of a single principle or by a single perspective. Of course, one may argue that a particular system or perspective scores point over other perspectives in being better satisfying desirable features of explanation like that of being simpler, more economical, more comprehensive, etc. But the fact that a particular approach explains the phenomenon fairly well and much better than the others need not imply that the approach does not have limitations with regard to other features of explanation or that the approach does not leave unexplained certain aspects of the phenomenon.

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