Identity, Equality, and 2=1 ("Me and Myself yet Not-I")

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Abstract

This paper is an exploration of both identity and equality, which ultimately argues that they are both one and the same. The paper begins by exploring the definition of Leibniz's Law and the relationship between the identity of indiscernibles and the indiscernibility of identicals. By taking the perspective that these are two sides of the same coin, the logic is then applied to the relationship an object has with itself and with others. This leads to an exploration of the logic of cogito, ergo sum, which results in an exploration of the difference between not being and non-being.
In the end a principle of inclusive middle and a principle of paradox are derived, which allow for this logic to establish that 2 =1. Thus, in the same way that assuming 1=1 leads to particular laws of thought that create conflicts in identity and equality in the real world, the idea that 2=1 resolves these conflicts and provides a new foundation to address the deontological and sociopolotical issues of our time.

Keywords: identity, equality, identity of indiscernibles, indiscernibility of identicals, Leibniz's Law, identity theory, logic, mathematics, 2=1, laws of thought, excluded middle, inclusive middle, noncontradiction, paradox, both-yet-neither, yet, doch

1 Introduction

"Treat others the way you wish to be treated"
"Do not impose on others what you do not wish for yourself."

These are two formulations of a very basic deontological idea that has been present throughout generations and languages all over the world. Yet one could argue that no one knows how to actually apply it to the real world. It touches on the thorny and undefined concepts of identity and equality before it dives into an even more complex puzzle that is morality. What does equal treatment entail? How ought equality be understood in terms of identity? Why should one individual be treated as identical to another? At the very core of

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all this is the relationship between identity and equality. Without a proper foundation to understand identity, equality, or the relationship between the two, it would be impossible to then move on to deontological, moral or ethical statements and principles.
This paper lays the groundwork for defining "identity" and "equality" in a way that initially seems irrational, inconsistent, and impossible but which, when properly understood, will prove to be not only logical, but also perhaps the best solution for a wide array of deontological and socio-political problems for the 21st Century and beyond. For this endeavor, our primary guiding question will be:

Problem 1.1 *What does it mean for an object to be identical/equal to itself?*

2 Leibniz's Law

2.1 Identity of Indiscernibles + Indiscernibility of Identicals

It would be easy to begin a conversation of Leibniz's Law and get caught into the debate about whether it means solely the Identity of Indiscernibles or if its definition also includes the Indiscernibility of identicals. As the very Stanford Encyclopedia of Philosophy (SEP) states: "Sometimes the conjunction of both principles, rather than the Principle by itself, is known as Leibniz's Law."[3] Therefore, in order to avoid lengthy debates outside the focus of this essay, this conjunction between the principle and its converse is taken to be the starting point for the current exploration of identity. In other words:

Definition 2.1 Identity of Indiscernibles - if x and y have all the same properties, then x is identical to y

$$\forall F(Fx \leftrightarrow Fy) \rightarrow x = y \tag{1}$$

Definition 2.2 Indiscernibility of Identicals - if x is identical to y, then they have the same properties

$$x = y \rightarrow \forall F(Fx \leftrightarrow Fy) \tag{2}$$

Theorem 2.3 ***Leibniz's Law*** - *Combines 2.1 and 2.2 to ensure that Leibniz's Law is understood to mean both the Identity of Indiscernibles and the Indiscernibility of Identicals at the same time.*

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

In short, the Identity of Indiscernibles and the Indiscernibility of Identicals are two sides of the same coin (i.e. Leibniz's Law). Any debate about whether Leibniz's Law does or doesn't include the Indiscernibility of Identicals falls out of the scope of this paper. But precisely by taking this definition as a starting point for identity, we will eventually reach a fundamental logical conclusion regarding equality.

2.2 The Relation Everything Has to Itself (and to Others)

It has been argued that: "In fact, no condition can be stated in a first-order language for a predicate to express identity, rather than mere indiscernibility by the resources of the language. [...] Identity is thus not first-order, but only second-order definable."[5] So perhaps the most herculean task within this essay is placing the arguments that will be made in a realm of logic that falls somewhere between first-order (predicate) and zeroth-order (propositional) logic. In other words, it is **both-yet-neither** and this precise phrase ("both-yet-neither") is the most imperative idea to keep in mind throughout the entire length of this essay. Only by starting at this foundational logical level could the lessons and implications of this essay be expanded on into other domains and applied to mathematics, computer science, set theory or sociopolitical problems in the real world. The reason for this is because at the very core of this logic, there is a 3-valued logic rather than a binary one. Hence, propositions can be true, false, or something in between, and this applies to all propositions *whether in propositional/zeroth-order or first-order/predicate logic.*

Rather than confusing the reader more with preliminary explanations, let us dive into the first and key conjecture of this thought experiment:

Conjecture 2.4 *2 = 1*
There is a high risk and probability that the majority of the people reading such an equation will immediately discredit it as false, irrational, nonsensical, and downright impossible. However, this is precisely why it was of the utmost importance to comprehend that this is a conjecture being made in a realm where logical statements are still at the level of being defined rather than critiqued. To see how this formula can acquire a useful meaning, we begin at a very basic metaphysical level and always keep in mind the words ***both-yet-neither****.*

For any relationship to exist, there must be at least two conceptual units. Arguably, these two units could even be one thing being observed from two angles. But the fact remains that a unit or person cannot have a relationship [even to itself] unless a secondary identity or entity is formed or created. The simplest and most rudimentary way to do this, is by providing two names for the same thing. This allows for a relationship to be analyzed which can then determine the exact number of objects that exist as well as how they are connected (or how it is connected to itself). One of the more classic metaphysical examples to analyze this relationship involves a very simple universe where the only things in existence are two spheres. So let us also take Max Black's "The Identity of Indiscernibles" [1] as a primary point of reference.

Right before the example of two spheres is brought up, Black states that:

Definition 2.5 "A is A and B is B" which we represent symbolically as:

$$a = a \wedge b = b \tag{4}$$

The sentence "a is a" is then said to be a useless tautology. And the discussion then turns toward the concept of "difference", where the next point of discussion is:

Definition 2.6 "A is different from B" which we represent symbolically as:

$$a \neq b \tag{5}$$

At this point, it is worth quoting the conversations at length, where Black's second character argues *"When I already know what 'a' and 'b' stand for, 'a is different from b' tells me nothing. It, too, is a useless tautology. [...] 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'."*[1] [2]
The reason for the lengthy quoting of Black's essay is because this is precisely what lies at the crux of my argument regarding identity and equality. The whole issue of identity boils down to, in my opinion, whether we prefer to use an uninteresting tautology that 1=1, or whether we want to pose and defend the idea that 2=1. For this argument to be made, we need one final lengthy quote from Black's essay: *"Now it is logically possible that somebody should enter the universe I have described, see one of the spheres on his left hand and proceed to call it 'a' ... All I have conceded is that if something were to happen to introduce a change into my universe, so that an observer entered and could see the two spheres, one of them could then have a name. [...] You talk as if naming an object and then thinking about it were the easiest thing in the world. But it isn't so easy ... you can't pick one out, let alone "name" it, by just thinking."* [1] [3] Here is where our discussion can focus on "thinking" and the presence/role of the observer.

2.3 The Role of the Observer: The Logic of cogito, ergo sum

As we have learned from quantum physics, the existence and presence of just one observer can change everything. Shrödinger's cat can be alive or dead, and a physical entity can be a particle or a wave, but the key deciding factor is the observer. Since we are focused on identity, and we want to apply it to real life, let us begin with one of the most common starting points for identity and the existence of the self: cogito, ergo sum ("I think, therefore I am"). Even if we were to take the revised "dubito, ergo sum"(I doubt, therefore I am), the key here is that the awareness of the self is the one thing that cannot be doubted because there must necessarily be an existence, a self. If we were to attempt expressing this statement in terms of logic, some possibilities might be:

- $think \rightarrow am$
- $am \rightarrow think$
- $am \leftrightarrow think (Iam = Ithink)$

It could be argued that the key issue here is causality. Since we cannot arrive at a conclusion for *why* awareness entails existence (apparently it just does,

[2] Black p.154
[3] Black p.156

since we cannot doubt it) the question is: *How* does awareness entail existence? *Am* "I" because I think, or do I think because I am? It is perhaps because of this issue that one can only say "I am" = "I think" and therefore identity is said to be only definable in terms of second-order logic. Propositional logic provides us with the logical foundations that subsequently allow us to determine the truth value of first-order propositions that argue about relationships, quantities and qualities.
But what if the very logic that we started with was the problem? What if the binary nature of True vs False is what prevents identity from being defined in first-order logic and it creates conflict when we use other types of logic? If identity at its core is ultimately a matter of subjectivity and consciousness, and we are trying to define in objective terms and language, then perhaps it would benefit from a special type of logic that presupposes its duality. In other words, this logic would *assume* that there are **both an objective *and* a subjective reality**. As we have seen with Schrödinger's cat, with wave-particle duality, and even with the two-sphere universe, objective reality is undefined [and arguably irrelevant] until there is a subjective observing entity. So a lemma deriving from our conjecture that 2=1 would let us presuppose that for every conscious entity/unit there are both a subjective reality and an objective one which are of course "somehow" [4] related to each other. In other words, instead of finding a way to explain why it is that cogito ergo sum, let us simply pose that:

Lemma 2.7 *Identity must be both objective and subjective*

It is my argument that only this approach, only this logic, would allow us to understand Leibniz's Law properly and reach a conclusion about the identity of objects. By acknowledging that there are necessarily both an objective and a subjective aspect to identity, we are claiming that one coin has two sides and without the two sides there could be no coin. [5]
Though seemingly irrational, it is my strong belief that all of this is quite intuitive and rather self-explanatory, especially once this new logic is properly understood and accepted. For the sake of thoroughness, I will now dive into a more rigorous analysis using symbolic logic. However,in terms of symbolic logic, one pivotal definition must be established:

Definition 2.8 Inclusive Middle (symbol) - Regardless of how it may be used or understood in other logics, the virgule or slash symbol **"/"** will be used to deonte an "inclusive middle". Only this will allow the both logic and the

[4] The remaining task at hand will be precisely to prove how the relationship can be logically explained/defined.

[5] This is also the precise logical reason why I chose to definition 2.3 Leibniz's Law as both 2.1 the Identity of Indiscernibles and 2.2 the Indiscernibility of Identicals. If the key to understanding identity is to see it as two sides of the same coin, the very law that we associate most closely with identity cannot be broken up and divided into two irreconcilable sides (this would eliminate the very coin/concept that we are trying to understand).

language to simultaneously express why and how two seemingly-different terms are actually interconnected as two sides of the same coin.

3 The Relationship between “Not” and “Non”

3.1 entia per se, entia per scio, entia per alio

There is a very fine yet fundamental difference between an object *not* being something else, and an object being a *non*-something. Let’s take the case of citizenship, where someone can be a German citizen (P), not a German citizen $\neg P$, or a non-German citizen (Q). Some might intuitively want to jump to the conclusion that not being a German citizen is identical to being a non-German citizen. Yet upon reflection it should be obvious that a Mexican would be a non-German citizen while the not-German citizen could either be the same person or someone completely Stateless (i.e. not German, or anything else in terms of citizenship).And therein lies the key to connect identity, and equality from logic all the way up to our sociopolitical problems of the 21st Century. For the sake of connecting with pre-existing literature, I will make reference to the concepts of “entia per se” which are said to exist [6] or have their own independent identities [7] , and “entia per alio” which have been called “ontological parasites” [8] since they derive all their properties from other things [9] .[2][4]

Definition 3.1 Entia

- P (ens per se)
- P = P (ens per scio)
- P $\neq \neg P$ (ens per alio)

Upon first glance, it may appear as though *entia per scio* are tautological, redundant, or unnecessary. Yet it is precisely by introducing a tautology such as $1 = 1$ that we can then refer back to the logic of cogito, ergo sum so that we may understand the role that awareness plays on identity.

3.2 Principle of Inclusive Middle

It should be stressed that at this point in time we only have one entity (P). We have simply established a relation to itself (P = P), and we have assumed that under the Principle of Excluded Middle (PEM), it must be the case that either P or $\neg P$. Most would consider all of this rather trivial. Yet this is precisely how we will derive that there is a difference between not being and non-being. The PEM states that (P v $\neg P$), but we can introduce the concept of an inclusive middle (PIM) by simply giving $\neg P$ another identity and starting out with the following:

Definition 3.2 $\neg P$ **= Q**

[6] Lucey p. 182
[7] Bunnin p. 213
[8] Lucey p. 182
[9] Bunnin p. 213

With this definition, we can derive that in fact there is such a thing as a non-entity, which allows for a PIM to be established:

Proposition 3.3 $[P \vee (\neg P \wedge non - P)] = [(P \vee \neg P) \wedge (P \vee Q)]$

It should be highlighted that I have intentionally applied disjunction and introduced an equation. There is in fact only one statement being made, which is that $P \vee (\neg P \wedge non - P) =$ True, but applying disjunction is what provides us with an apparent equation between two statements. Nevertheless, this formula should seem as trivial as stating that $1 = 1$ and this is precisely how we will enter a proof to understand the definition of the PIM.

Proof. As 3.8 states, we simply take $\neg P$ and assign its identity Q. Have we done anything? At its core, this question is essentially the same as when we say P = P or 1 = 1. These two are simply understood as tautologies because we understand that P and 1 are identical to themselves. So intuitively most would interpret $\neg P =$ Q as simply saying that one thing is equal to itself, regardless of the name. Numerically/mathematically, this also seems to make perfect sense. After all: 1 = 1. But precisely the fact that we have introduced a mysterious sign (=) should tell us that we have done something in terms of identity.

Proof. (Nested) Diving deeper: Even the most hardcore skeptic would be forced to concede at the very least that going from 1 to 1 = 1 introduces an observer. It forces us to look at one thing from two angles if for no other reason than the fact that it is now "the same thing" on two sides of one little symbol. Yet whether it be in mathematics, computer science, or society at large, this little symbol stands for both identity and equality. In other words, one could claim that identity = equality. But if we claim that identity = equality, then essentially we are either arguing that:

Problem 3.4 *Either*

- *1 = 1 ("they/it"* ***is/are*** *the same thing)*
- *2 = 1 (two non-identical things* ***are/is*** *the same/equal)*

Remark 3.5 And therein lies both the problem and the solution: it is impossible to determine if they are qualitatively or quantitatively identical precisely because we are driving a rift into qualities and quantities. As soon as we say "two non-identical things are the same/equal" we are unintentionally introducing a disjunction between identity and equality thanks to the meaning of "non-". Notice how much confusion was caused by trying to understand how "non-identical" things might be the "same/equal". To put it differently: we are not saying that two things are identical, but we are also not saying that they are different. So what are we saying? We are saying that: identity/equality = 1. Hence we return to Definition 2.8 where / symbolizes an **Inclusive Middle** to "simultaneously express why and how two seemingly-different terms are actually interconnected as two sides of the same coin." It is not that equality and identity are ***identical*** (P), nor that they are ***not*** identical ($\neg P$), they are simply ***non***-identical identities (P and Q).

Again I've introduced the / symbol into the equation precisely because two things can be identically or numerically the same and they can be identically or numerically equal if they are two sides of the same three-dimensional coin and we are debating about their two-dimensional traits. Returning to 2.3, we can see how even this principle about equality can be divided into two "non-identical" formulas 1 and 2 and a debate could ensue. But if we comprehend them both as two inseparable sides of the same coin (equation 3), then there is no conflict of identity or equality. In terms of the logical formulas, anyone can stress division and focus on either (2) or (1) instead of accepting that $2 = 1$.□

In other words: we can take any entity (P), put it in front of the mirror (=), and its mirror image or alleged "opposite" ($\neg P$) can be given another identity ($\neg P$ = Q). But this could put its own self-equality into question (i.e. how does P relate to $\neg P$?); conversely, two things (P, Q) can be given "identical" identities (P = Q) which ultimately also puts their equality into question (i.e. how many entities are there in fact?). Thus, by misunderstanding the symbiotic relationship between identity and equality, we might be wrongly led to enter a debate about whether we have two entities or one, when in reality $2 = 1$ because identity/equality = 1. Just to hammer the point home, one need to only ask: which of these two formulations should represent two entities: a) the disjunction of "$P \vee (\neg P \wedge non - P)$" which only refers to the existence of P? Or b) the conjunction of "$P \vee \neg P) \wedge (P \vee Q)$" that speaks of P and a mysterious Q entity? [10] Once this is understood, it can be seen that $\neg P$ and Q could very well be represented as $\neg P$/Q = 1, or as $\neg P$ = Q since there is such a thing as being (P), not being ($\neg P$) and a non-being (Q) whose identity is hinged on the concept of "identity/equality". □

Theorem 3.6

$$[P \vee (\neg P \wedge non - P)] = [(P \vee \neg P) \wedge (P \vee Q)] \tag{6}$$

Both $\neg P$ and Q can be understood as entia per alio given that $\neg P$ is simply a negation of P, while Q can be said to be a non-P entity. In other words, it exists, but is found in a potentially different set or category than P. The relationship between $\neg P$ and Q, and therefore between P and Q could also lead us to trouble if it were not for another principle that will help us understand how we got here in the first place thanks to *entia per scio*.

3.3 Principle of Paradox

Paradox [11] *- 1. a seemingly absurd or contradictory statement or proposition which when investigated may prove to be well founded or true.*
2. a statement or proposition which, despite sound (or apparently sound)

[10] Again, one need only apply disjunction in order to see that $P \vee (\neg P \wedge Q)$ is equivalent to $P \vee \neg P) \wedge (P \vee Q)$ even though the $\vee$ and $\wedge$ symbols might lead us to question numerical identity which is the core of the issue when we pose $\neg P$ = Q

[11] Definitions acquired from Lexico, a joint effort between dictionray.com and Oxford University Press (OUP)

reasoning from acceptable premises, leads to a conclusion that seems logically unacceptable or self-contradictory.

Philosophy is full of paradoxes, and one rarely needs to look up the definition of a paradox after they have been exposed to the first one. Yet to the author's knowledge there are no current logical systems which are inherently built to accommodate for this phenomenon. And the very definition of a paradox shows its inherently dual nature as either 1) something absurd that eventually proves to be true, or 2) as something seemingly true that proves to be self-contradictory. So in order to wrap together all of the arguments in this essay and reach a conclusion, let us pose the following Principle of Paradox (PP):

Definition 3.7 $\mathbf{P} = \neg P$

Although this seems utterly absurd and illogical, it should be recalled that conjecture 2.4 being made in this paper lies in a realm where logical statements are still at the level of being defined rather than critiqued, and somewhere between zeroth and first-order logic. This is why both the PIM and PP started out as foundational definitions rather than propositions to be analyzed. Our task will now be to provide a way in which we can understand the following as true:

Proposition 3.8 $P = (P \wedge \neg P)$

Proof. The key here is the concept of Self-Awareness. Self-awareness can lead to the affirmation of identity (P = P) or its converse, doubt (P = $\neg P$). It is like looking in the mirror, seeing a person, and saying "if I'm here, then who is there? And if that's me then why don't I ever see that?". This is the whole idea behind *ens per scio*: the self-awareness of our existence can either split our identity into an *existence* (P) and a *subjective awareness of existence* (P) which are equivalent (P = P), or into an *existence* (P) and its *objective reflection* ($\neg P$). But these identities obviously cannot be separated, and they are two reflections, two seemingly-opposing sides of one equal identity. In other words: P = $\neg P$. To put it in layman terms, self-awareness can be approached from two directions: we can either ask "why" or its converse "why not" ad nauseum. With enough creativity, mental capacity, and admittedly, time, one could always conjure up a reason why or a reason why not in the same way that we could conjure up reasons why "I am" or "I am not". After all, cogito, ergo sum is a *process*, and it is a *thinking* process of *identification.*

Proof. Nested Before the symbol for an inclusive middle was introduced, Lemma 2.7 argued that "identity must be both subjective and objective because it's two sides of the same coin". Trying to separate the two, as if one could exist without the other, would send us spiraling back into the discussion about the role of the observer from section 2.3. And the reason why we entered such a discussion touching on Schrödinger's cat and wave-particle duality was precisely because of the discussion in Black's article about identity. It is worth revisiting the entirety of the passages that were quoted (or the article itself), but the key declarations for our purposes are:

> "All I have conceded is that if something were to happen to introduce a change into my universe, so that an observer entered and could see the two spheres, one of them could then have a name [...] you can't pick one out, let alone "name" it, by just thinking."

Contrary to what Black's character states, it is in fact the "easiest thing" in the world to name an object and then think about it. And it's equally easy to do its converse: to think about an object and then name it. The whole core and content of the entire essay is precisely to imagine the simplest of universes and label it in order to make sense of it!

Problem 3.9 *How can Black, or anyone discuss the simplest of propositions (P) or the simplest of equalities ($P = P$) if it were not allowed to think of an entity and name it? It would be nihilism at its finest, and yet the very act of simply thinking and labelling should be enough to refute nihilism through a process of creation. In other words: If P can be created or doubted, then so can its converse $\neg P$. Yet if we are unable to establish a numerical identity/equality, then our only starting point can be $P = \neg P$.*

Remark 3.10 So it is precisely at this point that we prove the both-yet-neither nature of identity. It is both subjective and objective, yet neither alone if one attempts to separate them or combine them. [12] Hence $P = (P \wedge \neg P)$

Mathematically-speaking, Black's character is troubled by the idea that numerically there can be either one sphere or two. Yet even the quantum realm has shown to us that until an observer is introduced, physical reality can be in two states at once. So why can't mathematics and logic? It may not turn out to be useful for all fields and all applications of mathematics towards the real world, but identity and equality, like mathematics itself, are abstract concepts to help us make sense of our world. In Black's article, the characters struggle to reconcile between 4 ($a = a \wedge b = b$) and 5 ($a \neq b$). If we replace this with P and $\neg P$, then we could rephrase formula 4 as ($P = P \wedge (\neg P = \neg P)$) and formula 5 as (P $= \neg P$). But as we have seen from the previous proof, we can't assume numerical inequality as a starting point any more than we can assume different qualitative identities. Therefore we are left with the conclusion that it might indeed be the case that P $= \neg P$. After all, aren't both of Black's characters ultimately the same person? □

We are left with the conclusion that sometimes identity boils down to a process of identification. This process requires both a subject and at least one object. The subject, the observer, determines which relationship will be established between the object and himself. Perhaps s/he cannot determine the relationship that an object has with itself because another subject is then

[12] Hence the very definition of the word "yet". A similar type of mentality can be drawn from the usage of the German "doch".

involved, but when he is both the object and the subject, we are left with the conclusion that subject (P) and object ($\neg P$) are one and the same. Hence P = $\neg P$ or alternatively: $\square$

Theorem 3.11

$$P = (P \wedge \neg P) \tag{7}$$

And this is how we make sense of entia per scio. If entia per se can be said to exist, and entia per alio are dependent on the existence of entia per se, then there has to be an intermediary process connecting them. Entia per scio, and the Principle of Paradox (PP), provide us with a way to explain the process for identification. And this is why cogito, ergo sum, or dubito, ergo sum both ultimately boil down to what we want to believe and what we want to doubt. Either way, the process of identification requires at least a subject and an object, which in the simplest of cases can be the same entity, and therefore can be both subject (P) and object ($\neg P$). Logically speaking this would mean $P = (P \wedge (\neg P$, since P = $\neg P$ and we could simply substitute the terms to reach a tautology. In order to finally reach our conclusion that 2 = 1, we simply need to put the two new principles together.

4 Conclusion: Me and Myself yet Not-I

We can summarize the two principles from the previous section as follows:

Principle of Paradox (PP): $P = (P^{\neg}P)$

identity as process ("identification" - *entia per scio*) Theorem 3.7, Fornula 7

This principle tells us why and how an object comes to understand itself. It allows us to define identity as $P = (P^{\neg}P)$, where the = represents a process of identification rather than an established identity. To put it differently, when existence (P) undergoes a process of identification (=) it constantly has a choice to either assert identity (P = P) or to doubt it ($P = \neg P$), hence why $P = (P^{\neg}P)$.

Principle of Inclusive Middle (PIM):

$(P) \vee (\neg P \wedge non - P) = (P \vee \neg P) \wedge (P \vee non - P)$

identity as entity/entities (entia per se, entia per alio) Theorem 3.6, Formula 6

This principle essentially allows us to explain the fact that as soon as a not-entity is created, a non-entity may also be derived because it is automatically implied, meaning that there is either one existence or three, not two.

Inclusive Middle symbol /

So what are we left with?

Problem 1.1 What does it mean for an object to be identical/equal to itself?

> "Leibniz's Law appears to be crucial to our **understanding of identity**, and, more particularly, to our **understanding of distinctness**: we exhibit our commitment to it whenever we infer from "Fa" and "Not-Fb" that a is not identical with b. Strictly, what is being employed in such inferences is the contrapositive of Leibniz's Law (if something true of a is false of b, a is not identical with b).[5]

Now that we have explained how to understand an inclusive middle, Lemma 2.7 can be restated as: **identity = subjectivity/objectivity**. That is, subjectivity and objectivity are two sides of the same coin that is identity. Perhaps with our symbolic logic, Decartes would have stated existence as I = think/am, existence = being/conscience. Either way, let us conclude by turning back to Leibniz's Law.

Theorem 2.3 and Formula (3) were used to define Leibniz Law as: $(\forall F(Fx \leftrightarrow Fy) \rightarrow x = y) = (x = y \rightarrow \forall F(Fx \leftrightarrow Fy))$ However, with our logic system we could simply define it as:
$P = (\forall F(Fx \leftrightarrow Fy) \rightarrow x = y)\ /\ (x = y \rightarrow \forall F(Fx \leftrightarrow Fy)) = \neg P$

In other words: P = P, although perhaps it would be best to avoid any argument about logical contradictions by simply saying that they are two sides of the same coin, and therefore: $P/\neg P$. Either way, we are left with the conclusion that in this logical system: **2 = 1**.

In terms of equality, it would be logically and mathematically impossible for an object to be identical to itself unless the "self" already presupposes a new identity. So the tautology 1=1 entails and signals the creation of a different identity for the same being or at the very least it symbolizes two views of one identity, otherwise it could and should simply be stated as 1. If we continue with the mathematical approach, the point becomes clearer with 1 + 1 = 2. When we say that 1+1=2, the left side of the equal sign shows how 2 can be broken down into identical parts, while the right side shows the "whole". Though this is generally seen as obvious, or trivial, one might wonder why it would ever make sense to write 1=1 rather than simply 1. In the occasions where 1=1 appears, it is usually derived by playing with equations, which supports the idea that the two sides of the "=" sign represent different identities, or different ways of arriving at the same unit of existence.

Whether it is a principle or a person, by looking in the mirror and trying to find an identity, P is questioning its own existence and creating the possibility for a converse $\neg P$ to exist. At this point, because of its subjective relation to itself, there is necessarily a third entity being created non-P/Q. There is a subjective I (P), an objective me ($\neg P$) that is identical-yet-different from I, and non-me entities (non-P/Q). To put it in layman's terms: there is me as a subject (P), myself as an object ($\neg P$), other not-I objects (Q). Thus, without an observer there can be any 1 entity (real or imaginary) and it is pointless to claim that 1=1 because there is no identifier, but once there is an observer, it must be the case that 2=1. Only then can identity or equality acquire any meaning.

4.1 Final Remarks

Although a lot of this essay has been dense with attempts to create a new logic, it is nevertheless imperative to understand its implications and the potential for change if we embrace rather than immediately reject it. Let me begin with a personal example of individuals, extend it to sets, and then explain how it may be extended into other fields including computer science and deontology.

p - Me - objective existence

$\neg p$ - Myself - subjective awareness
Non-p - Not-I - subjective awareness of an "other" (person, object, etc)

It could be argued that this is precisely how an infant comes to understand itself and the world around it. First there is the Me, then comes the self awareness of Myself, and immediately with it comes the understanding of things that are Not-I. Although that applies for single entities, it can also be used for sets. Going back to an example at the opening of the previous section:

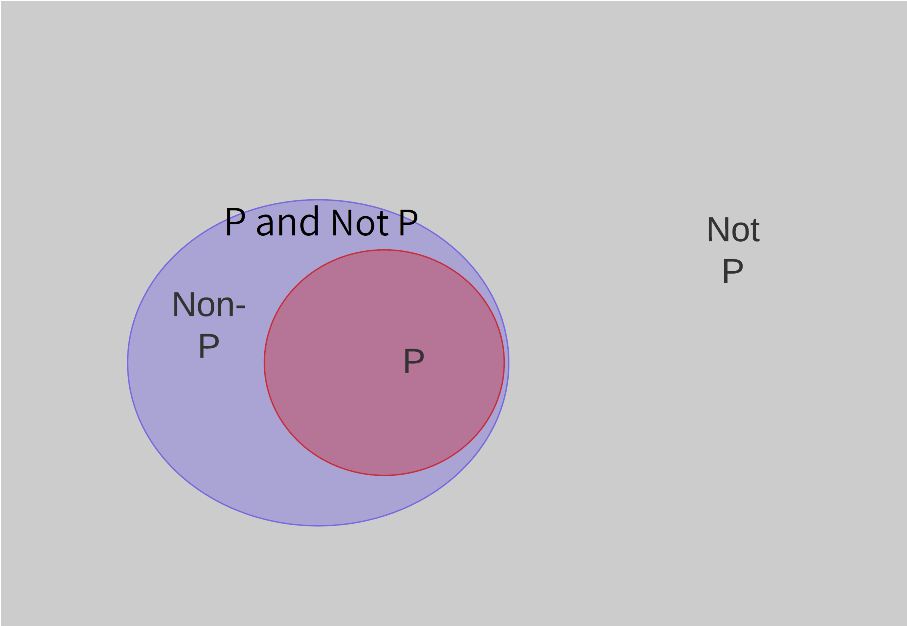
P - Category: German [citizen]
$\neg P$ - negative categorization: Not German [not citizen] (Stateless)
non-P - Non-German: Mexican [citizen]

When our logical, mathematical, and even legal systems operate on binary, the "third" is lost, and many people along with it. If we are to apply the logic of both-yet-neither, it could solve a lot of arguments whether philosophical, political, or computational. Are humans led by reason or emotion? "Both-yet-neither". Is a Mexican-American child of migrant parents a migrant or a local? "Both-yet-neither". It could even apply to colors when we claim that the color purple is both blue and red, yet neither. The whole point here is to develop a logic intended to integrate and include rather than divide and separate.
And while identity is something more related to qualia and persons, the issue of "equality" impacts not only our psychological perception of ourselves and others as well as our social and international policies but also our logic, mathematics, and computer programming. I argue for this definition of a logic founded on the number 3 precisely because of the potential that returning to "ternary computers" might bring. More importantly, since the topic at hand is deontology, a logic where both identity and equality are the same thing could be vital. Furthermore, the foundation of 3 can allow us to understand not only the grey area between right and wrong (i.e. neutrality), but also the implications of distinguishing between: action vs reaction vs inaction.

> "Treat others the way you wish to be treated"/"Do not impose on others what you do not wish for yourself."

The trouble here is that "I" may treat "myself" one way and "others" differently for an endless array of reasons. Perhaps I treat myself more kindly as a subject and others more harshly as objects, but there are some people who are harsher on themselves and they treat themselves as subjects and others as subjects. And then there's the issue of equality. It is a simplification to think that things are either equal or unequal. Based on observation and experience, It would be more accurate to have a ternary option where things are: equal, not equal, or non-equal. Perhaps this would explain why among nations and among individuals, "some are more equal than others".

Appendix



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