

Philosophical Perspectives of Identity

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March 17, 2021



Summary

Absolute Identity

Relative Identity

Identity Over Time

Criteria of Identity

Identity and Similarity

Final Remarks



Absolute Identity

Absolute Identity

Introduction

Absolute Identity

Identity Puzzle #1

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Introduction

“**Identity** is often said to be a **relation** each thing bears to itself and to no other thing” [1]

“To say that things are **identical** is to say that they are the same.” [2]



Introduction

Identity is a noun

Identical is an adjective



Definition

The **indiscernibility of identicals** (also called absolute identity, numerical identity, the standard account of identity or Leibniz Law) is usually formulated as follows [3]:

$$x = y \implies \forall F(Fx \iff Fy)$$

if x is **identical** to y , then x and y have all the same properties.



Definition

$$x = y \implies \forall F(Fx \iff Fy)$$

- Reflexive: $x = x$
- Symmetry: $x = y \implies y = x$
- Transitivity: $x = y \wedge y = z \implies x = z$



Equivalence vs (Absolute) Identity

“In mathematics, an equivalence relation is a binary relation that is reflexive, symmetric and transitive.” [4]

Examples [4]:

- “Has the same birthday as” on the set of all people.
- “Has the same absolute value” on the set of real numbers
- “Has the same cosine” on the set of all angles.



Critics

Some philosophers have denied that there is such a relation as (absolute) identity:

- Bertrand Russell (The Principles of Mathematics §64): Identity, cannot be anything at all: two terms plainly are not identical, and one term cannot be, for what is it identical with?
- Ludwig Wittgenstein (Tractatus 5.5301): “That identity is not a relation between objects is obvious.” At 5.5303 he elaborates: “Roughly speaking: to say of two things that they are identical is nonsense, and to say of one thing that it is identical with itself is to say nothing.”



Identity Puzzle #1

“Saying that a man who shaved his beard is not **identical** with himself before shaving seems to be absurd.” [5]



Identity Puzzle #1

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Raises some discussions:

- Relative identity
- Identity over time
- Criteria of identity



Relative Identity

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Introduction

The 'theory of the relativity of identity' proceeds from the axiom that **there is no such relation as numerical identity without any qualification**. There is rather an indefinite number of relations expressed by phrases of the form 'x is the same *N* as y', where *N* represents the place of a count-noun [1].

N is said to be a **sortal term** in a language *L* [6]



Introduction

Examples of 'x is the same **N** as y':

- I am of the same **species** as **you**
- **My chair** has the same **number of legs** as **your chair**
- **Minha xícara** tem o mesmo **formato** que a **tua**



Definition

Definition of an identity operator in RI [7] (there are others [8, 9]):

If $a, b \in T_L$ (where T_L is the set of terms of the language L) and $N \in P_L$ (where P_L is the set of predicates of the language L), then $a =_N b \in \mathbf{P}_L$ (where $\mathbf{P}_L$ is the set of all formulae of the language).



Examples of $a =_N b$

- Alice $=_{\text{is the same species}}$ Bob
- My chair $=_{\text{has the same number of legs}}$ Your chair
 - My chair $=_{\text{has the same number of legs}}$ My desk
 - My chair $=_{\text{has the same number of legs}}$ My cat
- $1 =_{\in \mathbb{N}} 2$



Identity Puzzle #2

My chair =_{has the same number of legs} Your chair

What if I remove one leg from my chair **right now**?



Identity Over Time

Absolute Identity

Relative Identity

Identity Over Time

- Introduction

- Endurance Theory

- Four-Dimensionalism Theories

- Identity Puzzle #3

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The Problem of Identity Over Time

1. “If a changing thing really changes, there can’t literally be one and the same thing before and after the change.” [10]
 - At time $t = 0 \rightarrow$ my chair has four legs (before the change)
 - At time $t = 1 \rightarrow$ I remove one of the legs
 - At time $t = 2 \rightarrow$ my chair has three legs (after the change)



The Problem of Identity Over Time

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 - At time $t = 1 \rightarrow$ I remove one of the legs
 - At time $t = 2 \rightarrow$ my chair has three legs (after the change)
2. "However, if there isn't literally one and the same thing before and after the change, then no thing has really undergone any change." [10]
 - Assuming absolute identity



Property Qualifier

- Aristotle's **essential** vs **accidental** properties/changes
- Lewis' **intrinsic** vs **extrinsic**
- How to define if a property is intrinsic or extrinsic?
 - "A thing has its intrinsic properties in virtue of the way that thing itself, and nothing else, is. Not so for extrinsic properties." [11]
 - "An object x has a property F in an intrinsic fashion iff F is independent of accompaniment" [11]



Property Qualifier: Examples

Intrinsic:

- An object o has round shape
- Person x has the property of *being Obama*

Extrinsic:

- Alice is married to Bob
- x is 1m away from y



Major Theories

Three-Dimensionalism Theory vs Four-Dimensionalism Theories

- Endurance Theory
- Perdurant Theory
- Stage Theory



Endurance Theory

“Material objects are persisting three-dimensional individuals wholly present at every moment of their existence” [12].

“What is essential is that an enduring object has no temporal parts” [13]

- Things are spatially defined, not spatio-temporally defined
 - “Things do not have temporal parts” [14]



Endurance Theory

Assuming Property Qualifiers (which seems to be the most common case [10])

- Extrinsic properties change, but intrinsic properties do not.
 - “Endurantists agree that you have different spatial parts at different times: you exchange molecules with the environment, you grow new hairs or lose a tooth” [14]
 - *Having one less tooth after March 11th, 2021* is an extrinsic property



Endurance Theory: Examples

- I am one thing, which endure (i.e. don't have my intrinsic properties changed) through my life
 - (Arguably) popped into existence the day I was born
 - (Arguably) will cease to exist when my brain stop being pumped blood
 - My height and hair color can change over time
- “The computer I use today is the same computer I used yesterday” [13]



Four-Dimensionalism Theories

Objects are extended through the time dimension much as physical objects are extended in space. [15]



Four-Dimensionalism Theories

“Persisting things **change their intrinsic properties**. For instance shape: when I sit, I have a bent shape; when I stand, I have a straightened shape. Both shapes are **temporary intrinsic properties**; I have them only some of the time.” [16]

- “The different shapes belong to different temporal parts of the changeable, persisting thing, which therefore perdures rather than endures.” [16]
- “Thus one temporal part of me has a bent shape, another a straightened shape” [16]



Perdurance Theory (i.e. Worm Theory)

“All persisting objects are four-dimensional ”worms” that stretch across space-time” [15]

Takeaways:

- Time is continuous
- You are mistaken in believing that chairs, mountains, and people are simply three-dimensional things [14]



Stage Theory

Persisting objects exist in a particular temporal part, or stage. However, there are other temporal parts which that subject is related to in a special "identity-like" relation [15].

Takeaways:

- Time is discrete
- When you talk about chairs, mountains, and people, you are simply referring to a stage of their four-dimension existence.



Recap: The Problem of Identity Over Time

1. “If a changing thing really changes, there can’t literally be one and the same thing before and after the change.” [10]
2. “However, if there isn’t literally one and the same thing before and after the change, then no thing has really undergone any change.” [10]

Conclusion:

- Endurance theory: partially solve the problem (can’t change intrinsic properties)
- Four-dimensionalism theories: solve the problem (can change intrinsic properties)



Identity Puzzle #3: Ship of Theseus

1. "Theseus owned a ship and the ship was entirely made of wood. Every time a piece of the ship needed replacing it was replaced with a metal part. This went on for a few years until eventually it was entirely made of metal." [17]
2. "Is the metal ship of Theseus the same ship as the wooden ship of Theseus?" [17]
 - Four-dimensionalists say **yes, it is the same 4d object**.



Identity Puzzle #3: Ship of Theseus

1. What if the wooden parts are preserved and a second ship is reassembled from the wooden parts exactly as the 'original' ship of Theseus?
 - Four-dimensionalists say **both ships are the same 4d object**.



Criteria of Identity

Absolute Identity

Relative Identity

Identity Over Time

Criteria of Identity

One-Level vs Two-Level

Vagueness

Identity and Similarity

Final Remarks



Criteria of Identity

“Standard by which identity is to be judged” [2]



One-Level vs Two-Level

One-level:

- In general, a one-level criterion for objects of sort F takes the form:
e.g., If x is an F and y is an F then $x = y$ iff Rxy

Two-level:

- If x is a G and y is a G then $d(x) = d(y)$ iff Rxy
e.g., If x and y are lines then the direction of x is identical with the direction of y iff x and y are parallel.



Problem of The Many

- Imagine flying through a cloud. When you are in the thick of it, the water droplets around you are clearly part of the cloud. As you exit the cloud, there are water droplets that are neither clearly part, nor clearly not part, of the cloud.
- Call one of these droplets d_1 and another of these droplets d_2 .
- Call the collection of droplets that are clearly parts of the cloud 'the core cloud'.
- Consider these four objects: (i) the core cloud, (ii) the core cloud plus droplet d_1 , (iii) the core cloud plus droplet d_2 and (iv) the core cloud plus droplets d_1 and d_2 .
- Each of these objects seems to meet the criteria for cloudhood.
- Thus, there seem to be at least four clouds where pre-theoretically we would have thought that there was one.



Vagueness

“A term is vague to the extent that it has borderline cases” [18]

“Peter van Inwagen (1990) argues that the problem is that we have assumed that the parthood relation is determinate. We have assumed that it is always determinately true or determinately false that one object is a part of another. According to van Inwagen, sometimes neither of these options applies. He thinks that we need to adopt some kind of fuzzy logic when we are discussing parts and wholes. It can be true to degree 0.7, for example, that one object is part of another.” [19]



Identity and Similarity

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Identity and Similarity [20]

Regarding people's *identity judgments* of the forms “a is identical to b,” “a is the same as b”

- These judgments are context-sensitive in that one and the same identity statement may be judged true in one conversational setting and false in another
- They can be vague
- Intuitions as to the correctness of a given identity judgment can vary greatly from one person to another



Identity and Similarity [20]

“Paradoxes of identity” is really a misnomer, and the identity puzzles do not essentially concern the notion of identity but rather point to certain misconceptions we hold of the notion of an object, or that of a property, or both, or some other metaphysical notion.

Identity is a context-sensitive and intransitive relation that may hold vaguely between its relata and that either is subjective or may easily give rise to subjective interpretation.



Identity and Similarity [20]

Our proposal, then, is that an ordinary identity statement such as some object a is identical to some object b is true iff a and b are highly similar in all relevant respects, where “highly” and “relevant” are both to be thought of as being context-dependent terms.

a is identical _{C} to b , or $Id_C(a, b)$



Definition [20]

$$Id_C(a, b) \iff \forall r \in S_C : d_r(a, b) \leq t_C^r$$

Where:

- S_C is a set of similarity spaces for context C
 - Properties are representable as regions in the domain of a similarity space
 - For instance, the property blue corresponds to a certain region in color space
- $d_r(,)$ be the distance function associated with that space r
- Associated with each $r \in S_C$ is a threshold value $t_C^r \geq 0$, which might be different for the same r in different contexts C



Examples [20]

- Identity statements concerning color shades: color shades are easily located in three-dimensional color space, and various metrics exist for that.
- The wife may seem to be right that her husband is no longer the *same person* he was at the time of their marriage and the judge may seem to be right that the husband still is the *same person* he was at that time: Within their respective contexts, and on a folk understanding of “same,” both the wife and the judge may be right.



Final Remarks [20]

- Solutions to the paradoxes follow directly from our proposal in that they do not require any additional metaphysical assumptions (4d objects, for instance).
- Does not require that we assume people's identity statements to be often mistaken.



Problems

- Contexts, their similarity spaces, and respective distance functions are *observer-dependent*
- The observer defines the similarity spaces and whatever counts as highly similar
- The authors acknowledge this, but do nothing about it



Problems

- What if two (or more) observers with different perceiving and/or reasoning/processing capacities perceive the same phenomena? For example:
 - Teenager vs elderly - vision and hearing capacities
 - Human vs dog - vision and hearing capacities and reasoning capacity
- Is it possible to define an identity relation taking that into consideration?



Final Remarks

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Final Remarks

- Absolute identity does not exist in the real world
- Our traditional (computer scientist) view of identity as a tuple (identifier, credentials, attributes) is just the tip of a philosophical iceberg
 - Identity is not a tuple: it is the relation between the tuple and its owner



Final Remarks

Identity is a context-sensitive, *observer-dependent* and intransitive relation that may hold vaguely between its relata and that either is subjective or may easily give rise to subjective interpretation.

Where observer-dependent means limited by the observer: (i) perceiving capacities; and (ii) interpretation capacity/understanding/language/nature.



Final Remarks

For example:

- The digital certificate that *is identical to* you
- The string Florianópolis *is identical to* a physical location
- What I see in the mirror *is identical to* myself
- The chemical reactions triggered from me poking a carnivorous plant *is identical to* a prey



Questions?

Thank you for your attention.

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