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Causal Theories of Reference for Proper Names

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Abstract

In this article I highlight and compare the main causal theories of reference for proper names, and propose a new approach based on the analogy of the causal chain of reference with the block chain from blockchain technology and Paul Ricœur's narrative theory. After a brief *Introduction* in which the types of sentences from the concept of possible worlds are reviewed, and an overview of the theory in the *Causal Theory of Reference*, I present the causal theory of the reference proposed by *Saul Kripke*, then two hybrid causal theories developed by *Gareth Evans* and *Michael Devitt*. In the section *Blockchain and the causal tree of reference* I present my idea of developing a new causal theory of reference for proper names through a causal tree of reference. In the *Conclusions* I talk about the further development of the ways in which the terms of reference could refer to certain objects and individuals, the main criticisms of the causal theories, and suggestions for future development.

Introduction

John Stuart Mill argued that names can be divided into two types: connotative and non-connotative. Proper names are the only names of objects that are not connotative and do not have a strictly meaning. (Mill 1882)

John Searle argues that each proper name is associated with a set of descriptions that determine the reference. Thus, the name denotes indirectly. (John R. Searle 1958)

Saul Kripke criticizes Searle's Fregean vision, arguing that the names are directly correlated with their nominatum, and proper names are rigid designators ensuring the same individual in every possible world. Kripke extends this idea to natural types of things: human, dog, gold, water, which would not be descriptive, but directly denotative. (S. Kripke 1980) Later, Hilary Putnam came to the same conclusion. (Putnam 1973)

Gareth Evans presents his own vision, distinguishing two types of descriptive theories: a theory of what a speaker denotes by a name, and a theory of what a name denotes itself. (Evans and Altham 1973)

Later, Searle returns by defending himself against Kripke's critics, introducing the concepts of "intentional content" and "intentional state."

In their definitions and arguments, philosophers have used the concept of possible worlds, with the real world as one of many possible worlds. Each proposition is either true or false, in every possible world. Thus, we have true propositions (those that are true in the real world), false (which are false in the real world), possible (those that are true in at least one possible world), impossible (or necessarily false propositions, those that are not true in any possible world), necessarily true (those that are true in all possible worlds) and contingents (those that are true in some possible worlds and false in others). Saul Kripke introduced for the first time a semantics of modal logic, in which a

possible statement is true in at least one possible world, and a necessary statement is true in all possible worlds.

1. The causal theory of reference

Descriptive theories have tried to eliminate certain logical contradictions if the names were considered definite descriptions. Kripke rejected the validity of these descriptive theories by arguing that no unique description of identity is needed, identifying descriptions can be used even if the reference has not been correctly identified, and a description (as opposed to a name) cannot function as a rigid indicator.

Subsequently, descriptive theories extended this idea of the disguised definite descriptions to a set of descriptions or a weighted average of these descriptions.

Causal theories of reference describe how terms acquire specific references (especially logical terms, proper names, and natural terms) based on evidence. In the case of names, a causal theory of reference assumes that 1) the referent of the name is fixed by an original designation (called by Saul Kripke "initial baptism"), after which the name becomes a rigid designator of that object; 2) the name is subsequently transmitted by communication through a causal chain. Saul Kripke and Hilary Putnam proposed the extension of causal theory to natural terms.

In general, causal theories of reference can be classified into causal-historical theories of reference (original version), represented in particular by Keith Donnellan (Donnellan 1972) and Saul Kripke, (S. A. Kripke 1979) with the idea of a causal-historical chain, (Cumming 2016) and the causal-descriptive theories of reference, (Psillos 1999) developed by David Lewis, (Lewis 1984) on the idea that there must be a minimal descriptive system as intermediate to the causal relations between the speaker and the object.

The main criticism of the causal theory was that the communication between the different users of the name is not enough explained.

Louis deRosset highlighted the main differences between descriptive and causal-historical theories: (deRosset 2011)

Descriptive theories	Causal-historical theories
Personal information helps to determine the name reference	It does not matter the information, only the historical position determines the name reference
You can't be massively misinformed about the name referrer	You can be massively misinformed about the name referrer
You can't really be under-informed about the name referent - such situations are deference cases	You can be under-informed about the name referrer
If you are under-informed but still use a name for a specific individual, you need to think about your own words	If you are under-informed but still use a name for a specific individual, you do not need to think about your own words

2. Saul Kripke

Since the 1960s, Kripke has been a central figure in several fields related to mathematical logic, language philosophy, mathematical philosophy, metaphysics, epistemology and set theory. He had influential and original contributions to logic, especially modal logic, and analytical philosophy, with a semantics of modal logic involving possible worlds, now called Kripke semantics. (Fodor 2004) He developed the argument that necessity is a "metaphysical" notion, which must be separated from the *a priori* epistemic notion, and that there are necessary truths that are *a posteriori* truths, such as "this water is H_2O".

In *Naming and Necessity*, Kripke proposed a causal theory of reference, according to which a name refers to an object by virtue of a causal connection with the object, mediated by the communities of speakers. He also states that the proper names, unlike most descriptions, are rigid designations (the proper name refers to the object named in any possible world in which the object exists). (S. Kripke 1980) The ideas from *Naming and Necessity* evolved over time, developing on the basis of previous formal research in model theory for modal logic, based on the Leibnizian principle of the indiscernibility of identicals.

Kripke states that descriptions cannot be taken as definitions of names, nor their references, nor their meanings. Kripke thus introduces the term "rigid designator" for something that designates the same object in every possible world and claims that the proper names are rigid designators. The existence of a rigid designator does not imply that the object exists in any possible world. It just assumes that in those worlds where the designator exists, it is the same object. Kripke lists and begins to discuss the six theses of the descriptive theory of names, highlighting a condition (non-circularity) necessary to satisfy these theses:

"For any successful theory, the account must not be circular. The properties which are used in the vote must not themselves involve the notion of reference in such a way that it is ultimately impossible to eliminate." (S. Kripke 1980, 259)

He rejects the theory that states that the referent of a name must be identified through a process of selection in which descriptions are compared or evaluated. In order to avoid circularity, the identifying description, although it does not have to include a self-reference, may include a reference to someone else's reference (a reference may borrow from another reference its authentication). Thus, Kripke outlines a causal theory of reference: a name spreads like a chain through words between people. The chain starts when a child receives the name and the parents start talking about the child using that name. At the other end might be a person who has never met the person and certainly does

not know the path followed by the chain of names to reach him. In Kripke's opinion, there is a connection from the initial "baptism", but the details are unclear.

Unlike Strawson who imposes the requirement that the speaker must know from whom he received the reference, (P. F. Strawson 1950) Kripke's theory does not impose any such requirement: what is relevant is not how the speaker thinks he received the reference, but the current chain of communication. The reference, for Kripke, depends not only on what we think about ourselves, but also on the community, on the history of how the name gets taken over by the speaker, and on other similar issues. For such a theory the results are somewhat different in the case of a famous man compared to an ordinary man. Basically, according to Kripke, there is an initial "baptism" in which the object can be named by ostension or the reference of the name can be fixed by a description. When a person communicates the name to others, the person receiving the name must have the intention, when using it, to assign the same reference.

Kripke admits that there are some cases where descriptions actually determine in fact a reference, but they are not synonymous with the name. The referent of the names is usually determined by a series of causal links between the people who used the name, and when the referent of a name is determined by a property attributed to that called thing, the connection is contingent, rather than necessary or essential.

Kripke highlights the situation in which the speaker has erroneous opinions about a person, in which case the reference is determined by the fact that the speaker is a member of a community of speakers using the name, which has been transmitted by tradition from one link to another. The role of uniquely identifiable properties, in many cases of designation, is only to set a reference, by some contingent clues.

This causal theory of reference can lead to several problems: there may be names that do not refer, the chain may be interrupted, a reference change may occur, and so on. In addition, Kripke did not sufficiently explain what constitutes a "link" in the chain.

According to Kripke, the sense of a name is the object it refers to, and the referent of a name is determined by a causal link between a kind of "baptism" and subsequent statements. He thus recognizes the possibility of additional semantic properties for sentences containing names, thus being able to explain why two names that refer to the same person can give different values of truth in sentences about beliefs. Later, in the article "A Puzzle About Belief", Kripke seems to oppose this possibility. (S. A. Kripke 1979) His argument would be that two names that refer to the same object but have different semantic properties should explain why co-referential names behave differently in sentences about different beliefs. Kripke claims that this demonstrates that assigning additional semantic properties to names does not explain what is intended.

Kripke sketches a causal picture of names with two components: reference fixing and reference borrowing. (Devitt and Sterelny 1999) Fixing the reference of a name is obtained by virtue of an "initial baptism". The reference is fixed to an object by a person present, by ostension or by description. Subsequently, the name propagates through the reference borrowing, through a "causal communication chain", spreading in the community. The chain shall be kept for at least as long as the persons hearing the name identify the reference to the same object as they have heard.

Kripke provides examples in which his theory does not seem to fail, as in the case of reference changes from a person who existed to a fictional character.

The causal chain of reference may include a person who has never met the referenced person and does not know what path the chain followed to reach it. In the example of the famous American physicist Richard Feynman,

"A speaker who is on the far end of this chain, ... may be referring to Richard Feynman even though he can't remember from whom he first heard of Feynman or from whom he ever heard of

Feynman. He knows that Feynman is a famous physicist. A certain passage of communication reaching ultimately to the man himself does reach the speaker. He then is referring to Feynman even though he can't identify him uniquely. ... he doesn't have to know these things, but, instead, a chain of communication going back to Feynman himself has been established, by virtue of his membership in a community which passed the name on from link to link, not by a ceremony that he makes in private in his study." (S. Kripke 1980, 91)

Unfortunately, Kripke does not provide too many and clear details, such as what constitutes a "link" in the chain. In addition, Kripke's theory also generates problems, such as the existence of names that do not refer to real people, or the possibility that the chain may break, or that a reference change occurs along the way, as in the case of Madagascar analyzed by Gareth Evans. (Evans and Altham 1973)

Searle, in his "Proper Names and Intentionality", criticizes Kripke's theory: (John Rogers Searle 1982) the explanation of the name's introduction into baptism is, in fact, descriptive; the external causal chain does not reach the object, only at the baptism of the object, which may or may not have an external causal connection with the object; we can introduce a name by description and use it as a reference, even as a "rigid designator", and abstract entities with their own names are incapable of initiating physical causal chains; the causal chain is not "pure", it includes intellectual content associated with each use of a name. His conclusion is that the image of Kripke's chain of causation does not offer a sufficient condition, nor a necessary one. The mistake of such a causal theory would be that it goes beyond the analogy between reference and perception that is explicitly developed by Donnellan. (Donnellan 1974)

3. Gareth Evans

Gareth Evans, in *The Causal Theory of Names*, states that the causal theory of reference needs to be expanded to include what he calls multiple "bases". After the initial baptism, the use of the name in the presence of the person can, under the right circumstances, be considered as reinforcing the name in its referent. For those who are in direct contact with the person, the reference for the

expression of the name is solved by means of a causal chain that includes people who knew him during the "baptism", or by indexing the person to the name at the time of communication. The causal chain can continue through a series of referential uses of the name throughout the person's life. If confusion occurs, the referent switching of a name may occur. (Evans and Altham 1973)

According to Evans, causal theory in its initial variant allows that no matter how distant or obscure the causal link between the use of a proper name and the object originally referred to, the reference is retained. The theory thus ignores the context by resorting to "magic tricks", and therefore cannot explain the changes of reference.

Evans agrees with Kripke in rejecting the descriptive theory of reference, arguing that a subject may think of a particular object by virtue of the existence of a contextual relationship with it; but it challenges the cryptic image by accepting the idea that a name may change its reference over time and arguing that a mere causal link is not enough to refer.

Subsequently, in *The Varieties of Reference*, assumes Frege's principle "no reference, no thought" (a sentence containing a name without a reference has no value of truth and does not express a thought); thus the semantic function of a name is to refer to an object, excluding the name with sense but non-referential. (Evans 1982) But, unlike Frege, he appeals to Frege's assimilation of the use of empty names with the fictional uses of language that express the pretended senses or pretended thoughts. (Borchert 2006)

For Evans, the singular terms (including those that include demonstrative pronouns) conform to the principle "no reference, no thought", calling them "Russellians".

Evans rejects the solid thesis (that the theoretical conditions of the description are sufficient) by accepting the weaker thesis that a descriptive identification is required for the name. He thus sees the theory of undifferentiated description as an expression of two ideas.

"(a) the denotation of a name is determined by what speakers intend to refer to by using the name

"(b) the object a speaker intends to refer to by his use of a name is that which satisfies or fits the majority of descriptions which make up the cluster of information which the speaker has associated with the name." (Evans and Altham 1973)

With (a) there are problems when interpreted at the micro level, but in names, as for other expressions in the language, "what they signify depends upon what we use them to signify". (b) is the real problem: the intended referent of a common use of a name by a speaker cannot be an element causal isolated to the user's community and culture; but " the important causal relation lies between that item's states and doings and the speaker's body of information—not between the item's being dubbed with a name and the speaker's contemporary use of it." (Evans and Altham 1973) Denoting a name in the community will depend in a complex way of what those who use this term intend to refer to (the "intended referent").

Evans tries to eliminate the problem of ambiguity by using an indefinite notion of speaker reference through borrowing from communication theory. We gain our knowledge and form our beliefs in the process of collecting information through a causal interaction with a particular object that is part of a long causal chain. Legends and imagination can add new elements. Incorrect identification can differentiate the considered source of information from the real one. It turns out that a set of information may contain elements from different sources, being able to reach a dominant element belonging to a source different from the original one. A speaker usually refers to the dominant element in the associated set of information.

In this context, Evans offers the following definition proposal:

""NN" is a name of x if there is a community C—

"1. in which it is common knowledge that members of C have in their repertoire the procedure of using "NN" to refer to x (with the intention of referring to x);

2. the success in reference in any particular case being intended to rely on common knowledge between speaker and hearer that "NN" has been used to refer to x by members of C and not upon common knowledge of the satisfaction by x of some predicate embedded in "NN""

Thus, Evans distinguishes between using on the basis of what we know and using on other bases, thus distinguishing between the referential functioning of names, which can be grammatical descriptions, from those of descriptions. (Evans and Altham 1973) The intentions alone are not sufficient for a name to obtain a denotation, but without clear intentions there may be no common knowledge required for practice.

Evans's conditions are stricter than Kripke's, eliminating his "magic."

In order to allow the name to be able to change its denotation, Evans proposes a supplement to the above definition with a new, *deferential* term (regarding individuals or groups of people who extend the use of expressions in a community).

Evans offers various arguments to show that Kripke's theory does not fit our practice of using names: contextual determination of who it is important except for causal theory, (Bhowmick 2015, 194) one can use the name without be necessarily causal connected with other users of the name, there is the possibility of a unified approach for all the ways of eliminating the ambiguity of the discourse, the *change of reference* is not taken into account by the causal theory of the reference.

In conclusion Evans does not claim that causal theory is wrong; he is just trying to adapt it to the use of people's names under ordinary circumstances.

Gareth Evans states that there may be wide variations between understanding "producers" (people associating names with person recognition) and "consumers" (who, according to Evans, are not able to inject new information into practice, but must use the collection of information from producers. (Evans 1982)) of proper name statements. According to Sikander Iamil, "acceptors" are true players in using proper names, using the name of a specific referent based on information received from other speakers. But there is a possibility of distortion of the received information, since the proper names strengthened, after their appointment, only by their use by the acceptors: "The meaning of proper name is provided by its immediate correspondence with a particular object. That's why a

proper name and referent should go together; thinking one will lead the other. We may also assert that any speaker may use a certain name even without having an understanding of it, which means simply the understanding of the corresponding object i.e. its referent. But one may claim that any misinformation may contaminate thinking of ' the speaker regarding the referent of name." (Jamil 2011) Evans argues that "Full understanding of a use of a name requires that the referent of the name be an object of the subject's thought." (Evans 1982) Thus, the proper name depends on the users' faith, thoughts and intentions.

Only one producer presents sound arguments because of his initial knowledge of the name. The consumer knows the referent only according to the information provided by the producer.

The more often a name is used by speakers, the more it strengthens in the minds of the speakers, making it more and more authentic. If a name with different referents in two distinct communication networks, additional information is required for correct identification when the information passes from one network to the other.

A special problem arises in the case of a community that functions as a closed but permeable information system. In such a closed system a name can be distorted (intentionally or not), resulting in several proper names for the same referent that can operate in parallel, sometimes overlapping in the communication between different networks. This distortion can take the form of spreading *fake news*, or it can be intentionally used in the processes of slandering a person or a group of people, or even within state propaganda. In such a case, the framework for stipulating the reference by name proposed by Kripke through the initial baptism no longer applies. This distortion will not occur when the recursive principle proposed by Saul Kripke is applied, (S. Kripke 1980) whereby the one who established the reference to the initial baptism stipulates practices in the use of their own names, and the consumers will use the name in this respect, calling for a specific use identical to the one proposed by the one who named it.

Reference change is not possible according to descriptive theories. Initial causal theories do not pose the problem of reference change. Gareth Evans considers the significance of the change of reference, possible even from the initial baptism, although changing the reference to one's own name is much more difficult than in the case of natural terms, setting the Madagascar case as an example. (Evans and Altham 1973)

Evans argued that the bearer of a proper name, used by a community of speakers, is the main source of causality of the information that members of the community associate with the name. Imogen Dickie sees Evans' suggestion as a major breakthrough, but it raises some issues. (Dickie 2011) Dickie takes "proper name" as a standard or default semantic type natural term, for which no additional settings are required. This assertion allows proper names to be used in other ways (e.g., to communicate about objects other than their bearers) depending on the scenarios.

Dickie concludes that Evans is right that proper name has an essentially asymmetrical structure, assigning a privileged role to a core group of speakers. But Evans is wrong in stating that producers are important in establishing a name-based practice, suggesting that the role of producers is to ensure dominance, but that does not imply the exact transmission of information. The consumers are the active participants.

According to Evans, the mental state of the speaker matters in determining the reference. For him, the causal origin of a name is not important in the reference; an object derives a name by virtue of the fact that it is the main source of causality of the information associated with a name. (Bhowmick 2015, 195) But, by eliminating the need for initial baptism, Evans's theory raises two objections: the qua problem and the problem of incorrect causal source.

The qua problem is considering the example of the cat "Trump" who was actually a flowerpot. From an intuitive point of view, it seems that the use of this name does not refer to anything, it is an

empty name. It follows that successful referencing requires that the individual initiating the use of a name has at least a correct notion of the object it refers to.

The problem of the incorrect causal source arises when the referent is no longer related to a name by individuals who were in the presence of the object.

4. Michael Devitt

Michael Devitt develops a hybrid causal theory of non-empty proper names and certain singular terms that semantically resemble them. He considers that the use of a name designates an object not by virtue of the different information we know about it, but by a causal network that starts from the first uses of the name to designate the object, through a "reference borrowing" from the previous uses. (Devitt 1981)

After the initial "naming ceremony", to use this name, a speaker must already have the ability to use names ("a mental state which is brought about in a language user by perception of a naming ceremony (and in other ways to be described) and which is apt to produce (in part) certain sorts of utterances—utterances using the name in question"). The first uses are causally related to the object, and then transmitted through a causal chain called by Devitt the "d-chain", *d* from "designation." The ability allows the use of the name in an ordinary predication. But, unlike descriptive theories, it is not necessary for a person to have a substantial set of beliefs that involve the name.

The causal chains that are linked together form the causal network for a type of name. There can be *multiple* d-chains on which a person's use of a name is based, and a causal network based on its symbol formed from the union of all these individual networks. Devitt introduces the term "name token" which designates the object on which the underlying d-chain it is founded.

Each time we hear a name being used, we must associate it with an ability.

The correct understanding of the use of an ambiguous name is based mainly on the (external) context for the clues, usually represented by a reliable guide in terms of the speaker. The designatum

from the context depend a lot on what we already believe, especially about the speaker (what we think the speaker can designate by this name, and what we think he thinks we can designate through him and what he thinks we know about his designation abilities). Another important clue for interpreting a name token is the predicate used with it. In the case of an ambiguous context, we can ask the speaker to tell us his intentions.

The d-chain starts with the perception of the object. The clear cases are those of "face-to-face perception" of the object. The connection between a name token and its object can be mediated by a description. If this connection is to be a d-chain, it is descriptive.

According to Devitt, *cross-reference* is an example of how a token may depend for its reference on another. In his theory of *reference borrowing*, an analog type of dependency is the set of most single-term tokens. Also, if an object is selected by an attributive description to its name, then the resulting name will be assigned and the object is not involved in the causal network for this term at the beginning of the network but may be involved later. Otherwise the network becomes grounded in the object and an attributive name becomes designative. The grounding allows a causal theory to explain the change of reference and certain errors and misunderstandings.

A name can be indirectly grounded on its object, on certain types of representations of the object.

Devitt states that a name token designates an object if and only if "underlying the name is a d-chain grounded in the object". The d-chains consist of three different types of links: "groundings which link the chain to an object, abilities to designate, and communication situations in which abilities are passed on or reinforced (reference borrowings)". (Devitt 1981, 66) A person may lose the ability to designate an object when they cease to have thoughts that include tokens grounded in the object. An association between description and name consists in preserving the beliefs that the user would express using names and descriptions. But not all thoughts are beliefs.

A problem that may arise is when the causal chains for the term can be grounded in several objects or are not grounded in any object. Or, more abilities, and therefore more networks, can play a role in producing a designation term. Also, misunderstandings can lead to the involvement of several objects in a causal network.

Groundings plays an essential role in Devitt's theory, representing the final link between all (designational) names and the world.

In the case of a designation change, there are two possibilities: the old name continues to coexist with the new one, or not. This possibility allows a plausible explanation for the gradual transition from one naming convention to another. For a designation change to take place, a network initially grounded in one object must become grounded in another. The object must be of the same more general category.

In the case of several networks, the similarity between them is a matter of degree, resulting in different notions of synonymy that can be defined in terms of similarity. Two networks become more similar if they are grounded in the same object.

Although most names are conceptual, some are attributive, respectively a network is grounded in an object through a description.

d-Chains are based on some notions that remain largely unexplained; the notion of perceiving an object is not sufficiently clear; as in the case of notions of thought, and of the notion of cause.

The basic idea of the *Devitt's causal theory of grounding* is that the name is introduced into a formal or informal dubbing, in the presence of the object. (Devitt and Sterelny 1999) Perception must be causal. A witness to the dubbing will have the semantic ability to use the name to designate the object by virtue of the causal link; the perception of the object determined the thoughts that led to the use of the name.

The *causal theory of the reference borrowing* implies that people who are not at the dubbing acquire the semantic ability from those at the dubbing, which is also a perceptual causal process. The name is used in communication. Hearers can gain the ability to use the name to designate the object by virtue of causal chains that link the object, naming, and user through discussion.

A name has both reference and meaning. The meaning of a name is a particular property of the name, designating its bearer through a certain type of causal link between name and bearer. The aspects of reality that we must call to explain the reference are sufficient for meaning. The reference of a name is determined by the appropriate causal chains, and thus by its meaning.

The theory developed by Devitt shares with the descriptive theories the ability to account for certain special features of natural language: independent stimulus (the causal chain on which its use depends does not require the presence of the object); arbitrary and independent of the environment (any symbol from any environment can be placed in the appropriate causal relation with the object); and so it must be learned. Unlike descriptive theories, this theory can also explain the apparent abstractness of one's names. Also, according to Devitt, it avoids the problems of descriptive theory, can solve the problem of identity statements, promises an explanation of the final links between language and the world, and the explanation regarding causality seems to be naturalistic.

Devitt concludes that causal theory about names cannot be a "purely causal" theory; it must be a "descriptive-causal" theory, so that a name is associated with a description in a grounding, thus appearing a descriptive element in the characterization of a d-chain. (Devitt and Sterelny 1999, 80)

In setting the reference, a name is ostensibly introduced at a binding event in the presence of an object that will henceforth become the referent.

The ability to refer is a mental state that contains a set of thoughts (beliefs, desires or hopes) that are grounded in the referent and associated with the name.

In the reference borrowing, those individuals present at the initial appointment spread to others the ability to refer through communication.

To refine the notion of fixing references, Devitt uses several *groundings*, basing a name on an object just like the initial naming.

Devitt's theory successfully deals with the qua problem, stipulating that the one who grounds names must perceive both the object and the thought of the object under a general correct term. Some degree of matching is required for a name initiator to obtain a name in an object. (Yang 2017)

In the question of the incorrect causal source, Devitt's theory also provides an intuitive answer.

Both Devitt and Evans believe that Kripke went too far in denying the descriptive elements. Thoughts associated with the name have a reference role. But I agree with Kripke that the name refers by virtue of a causal relationship.

But although Evans believes that the initial baptisms play no role in the reference, generating the qua problem and the incorrect causal source problem, Devitt accepted the idea that appointment is essential, but that there is nothing necessary about the initial appointment. Through multiple groundings, he avoids the problem of changing the reference due to the error, without having to eliminate fixing the reference as an essential component of the name theory. Also, Devitt manages to avoid the problem of the source of incorrect causation because the names can only refer if they are causally related to the object through direct perception, and the problem stipulating that those who ground must have the correct belief of the object under a generic term.

5. Blockchain and the causal tree of reference

In a previous article, *Philosophy of Blockchain Technology - Ontologies*, (Sfetcu 2019) I talked about applying Paul Ricœur's narrative theory in developing an ontology of blockchain technology. In this section I intend to highlight the idea of an analogy between blockchain technology and the causal

theories of reference. To the extent that further deepening of this idea will prove viable, I will try to develop a theory based on this analogy.

Blockchain (The Economist 2015) (Morris 2016) (Popper 2017) is a constantly growing block chain (Brito and Castillo 2016) (Trottier [2013] 2018) that contains records called blocks, which communicate with each other through messages. (The Economist 2015) We can consider a *block* as a certain *sentence*. The sentence is taken into consideration only if it includes the reference, as in a blockchain a block must contain the transaction data. Each block/sentence contains a timestamp and transaction data. The *transaction data* can be considered here as analogous to the *reference*, which links a name to an object. Just as in a blockchain a transaction is *initiated* by a *miner* and the causal chain starts from him, in a causal theory there is an *initiator* who gives the name and establishes the reference between name and object in a process (initial *baptism*).

Blockchain is designed as "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way," (Iansiti and Lakhani 2017) using a peer-to-peer network. The *transaction* is the initial naming (*baptism*, according to Kripke), (S. Kripke 1980) and the *peer-to-peer network* represents the *bilateral communication* system between two *nodes* in the blockchain respectively two *users* of a community. After *recording the data* (*accepting the reference*), the data/reference in a given block/sentence cannot be modified retroactively without changing all the data/reference in all the blocks/sentences included in that chain, which requires the consent of the network (of the chain nodes; of users in the case of causal theory). Unlike the blockchain, where the block communication is made only between two nodes, and thus a chronological chain is formed, in the case of a community reference communication can be done from one user to several users simultaneously, which can then forward the reference, so here we can actually talk about a tree system, a **causal reference tree**. In the blockchain, at the same time as the data transmission, other additional information can be transmitted, but the acceptance is done only for the transaction data, the additional

information gives details about the transactions but does not count on the acceptance. In this potential causal theory, additional information (descriptions) can be transmitted simultaneously with the reference, but they are not taken into account when accepting the reference by the other users. From this point of view, such a theory of a causal reference tree rather accepts the idea of Saul Kripke, (S. Kripke 1980) that in a causal theory the descriptions do not matter. If the descriptions are intended to be included in the causal reference tree and some of these descriptions are modified, disappear or added over time, a temporary marking system can be imagined recording the changes. An idea would be, according to Tom Gruber in the paper *On the design principles of the ontologies used for knowledge exchange*, (Gruber 2008) the descriptions can be assimilated to the ontology as a technical term in the field of computer science: an ontology is a description (as a formal specification of a program) of the concepts and relationships that may exist formally for an agent or a community of agents. This definition is compatible with the use of ontology as a set of conceptual definitions, but more generally. And it is a different meaning of the word than its use in philosophy.

Such a causal theory thus becomes, like blockchain, a secure, distributed system with a high tolerance for errors. (Raval 2016)

Each acceptor of a reference thus memorizes the connection between the name and the object, and optionally the other additional information (descriptions, attributes). The causal tree is propagated only by the users who have accepted the reference (acceptors), and they in turn can forward the reference to other members of the community in subsequent discussions, which can become acceptors when they accept the reference.

Each node/member of a community can initiate a new transaction/can name an object through an initial baptism, which is the starting point of a new chain/tree insofar as it is accepted by other nodes/members.

Communities that include the causal tree of reference may be open (may include new members accepting the established reference), closed (the reference is transmitted only between current members of the community - in the case of esoteric groups, for example, or of references considered secret), or permeable, where the reference is transmitted outside the community only under special conditions.

If one of the nodes/members has, for the accepted name, another reference, or modifies (intentionally or not) the accepted reference for that name, a new branch is formed for the new reference, but not in the same plane as the accepted reference. with the consent of the other users. This is the case of a *change of reference* in causal theories. This leads to a **three-dimensional causal tree of reference**, and the new branch is the initial baptism for the new reference. If this new reference is accepted by other members, it is transmitted causally through the newly formed two-dimensional tree, parallel to the already existing dimensional tree from which it came off.

For several two-dimensional trees that are part of a three-dimensional tree, the most-developed two-dimensional tree becomes the main two-dimensional tree of the three-dimensional tree (the case of a name referring to a famous person). The other two-dimensional component trees become secondary trees.

Such a theory can be interpreted as a result of syntactic notation in a reference field, based on the narrative theory developed by Paul Ricœur in *Time and Narrative*. (Ricoeur 1988) For Paul Ricœur, there is an order and a structure of history transmitted through the narration of history, otherwise history would be unintelligible. But the events and facts of this narrated history disrupt the dominant order and rearrange it. Ricœur examined a number of different forms of extended discourse, starting with metaphorical discourse. Narrative discourse is one of the forms investigated by Ricœur, (Pellauer and Dauenhauer 2002) configuring heterogeneous concepts that identify actions at a time when one thing happens not only after something else, but also because of something else from a story or history

that can be followed. It reshapes physical events as narrative events, which make sense because they tell what is happening in a story or history. Narrations are always a synthesis of the heterogeneous concepts that shape the episodes of the story.

In *Time and Narrative*, Ricœur stressed the importance of the idea of a narrative identity. (Ricoeur 1988) Ricœur's argument regarding individualization continues through a succession of stages. He starts from the philosophy of language and from the problem of identifying the reference to people as individuals themselves, not just things. This leads to the consideration of the speaking subject as an agent, passing through the semantics of the action Ricœur had learned from analytical philosophy.

Conclusions

Kripke was aware that there may be several different uses for a name, which are used in different contexts (with different references). In the initial baptism, a name may be accompanied by a description. But Kripke considers that description to set only a reference and *is not synonymous* with the name with which it is associated. For this reason, Searle criticizes the causal theory.

According to Sikander Iamil, the contexts in which statements are made are also important in identifying and determining references. Donald Davidson attempts to branch out the theory of meaning into two methods, the building block method (the simplest propositions form the complex ones) and the holistic method (starting with complex sentences and then analyzing its components). The first method is not a pragmatic approach, while the second method can be used only to understand the components, but the semantic value of the sentence can be distorted. (Jamil 2011) For the theory of meaning by means of Davidson's block method, causal theory has no pragmatic value.

Eliot Michaelson and Marga Reimer consider four distinct ways in which terms of reference could refer to certain objects and individuals in the world. (Michaelson and Reimer 2019)

1. Descriptive model: words are associated with descriptive content to identify a specific referent;

2. Causal model: the words are associated with the causal chains starting from an initial "baptism" of the referent;

3. Character model: words are associated with common rules of reference, which involve the repeatable elements of the context, identifying the referent from these elements;

4. Intentionalist model: words are used intentionally to refer to certain objects, as part of complex intentional actions that are aimed at certain referents.

Of these, three reference models are basic in the metasemantics of referential terms: the descriptive model, the causal chain model and the character model. The last two, through hybridization, can help clarify important aspects of indexical name theory. Kaplan proposes that the context, in addition to the speaker, place, time, etc., should include the most important individual bearing a given name. (Kaplan 2006) But it always seems difficult to use the name to refer to the most important individual of that name in a context. In addition, accepting this type of indexical theory involves renouncing some of the benefits of causal theory, including simplicity, and the fact that we no longer send names for things, just the reference to the most important bearer of that name in a certain context.

Causal theory can be considered a special case of character theory, in which terms such as names and rules are explained within a causal chain.

Causal theory offers ways of thinking about an object by transmitting a name. The communication here is simple, provided the name is recognized on a certain occasion. But causal theory is a non-expansionist model of reference, usually being used only for reference to names. It will have to allow the existence of other types of relationships in order to extend the reference for other types of terms and different uses of the same term.

Regarding narrative theory, some researchers consider the narrative to be an instrumental cognitive ability or a linguistic instrument, while others consider it an ontological category related to

how people are in the world, (Meretoja 2014, 89) or understand human life itself as having a narrative character. (MacIntyre 2007, 114) Another theoretical division regarding the role of narrative exists between an empirical tradition denouncing narration as a fundamental philosophical concept (G. Strawson 2004) and a hermeneutic tradition rejecting the idea of immediate experience of narratives and argues that all representations of the world human subjects are mediated by human linguistic interpretation, (Taylor 1971, 4) that subjectivity is always mediated by language, signs, symbols and texts. (Meretoja 2014, 96)

David Kaplan suggests that Ricœur's hermeneutic method, as well as the analysis of the hermeneutic circle between human experience and narration, may enrich the analysis of context by including notions of linguistic and social mediation. (Kaplan 2006, 43–44)

The reference is generally interpreted as a relation between language and reality, but W.V.O. Quine argues (Quine 1960) that it is inherently indeterminate or "inscrutable", that is to say, we cannot determine what this means.

One problem discussed by Peter Unger (Unger 1980) and Geach (Geach 1962) is that for many physical objects there are several candidates to be the referent of a singular referential term. Without a way to select one of these we can ask to what extent they can be referenced.

Donald Davidson is even more radical. (Davidson 1977) He argues that ref erence is a theoretically irrational notion, useless in a semantic theory or a theory of strict and literal meaning. His argument is that no substantial reference explanation is possible.

Also, the deflationist theories of reference claim that there is nothing more in the concept of reference than what is captured by the instances of a scheme such as: 'a' refers to a. (Field 2001)

But, with all the problems highlighted, the nature of the relationship between language and reality continues to be one of the most thoroughly discussed and debated in the philosophy of language.

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