McTaggart's Paradox and Philosophy of Time

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Abstract

Asking "What is time?" can be both a simple and a profound question. In this article we intend to introduce the reader to the philosophy of time. To do so, we will deal with McTaggart's paradox. By explaining it and introducing the basic concepts to understand it, we will be able to get an idea of what this branch of philosophy is all about. The main intention of this article is not to explain anything new but to clarify the background of a debate by explaining its roots. By taking a deep dive into the concept of time, we will see that it is not a simple concept at all.

In any subsequent possible definition with regards to concepts such time for education or time for ethics, a logical clarification of what time is important and will color all further predication of the concept of time. Considering the impact of digital transformation in our lives in general, and in education in particular, a philosophy of time brings major elements such as paradoxes, which are not of practical character but important for the semantic of the words, such as "duration", "temporal position" of events, etc.

1. Introduction

We could say without exaggeration that the contemporary debate on the metaphysics of time in the analytic tradition has its origins in the paper "The unreality of time" by the idealist philosopher John M. E. McTaggart published in 1908 in the journal *Mind*. Both the analysis of the question and the terminology used in his article have led to all the subsequent debate, which is why it is still a must-read article if one wishes to understand the substance of the debate.

In this paper we will try to introduce the reader to the contemporary debate about the philosophy of time. That is why we are not going to start with Plato's or Aristotle's conception, but rather with McTaggart's conception of time. Then, we will present his argument as well as possible objections and interpretations that will help us to see some of McTaggart's presuppositions.

But before we start, we must look at the meaning of the word "time" in order to understand what we are talking about and, more importantly, what are we not talking about.

If we ask "what is time" to people who have no interest whatsoever in philosophy, we can get two kinds of answer. On the one hand, the answer may have a condescending or elusive character, implying that the question we have asked is basically meaningless. On the other hand, the answer may have an eminently practical character such as "time is what the clock says", implying that the question is trivial. But this is not the kind of answer a philosopher expects.

First of all, the word "time" can have several meanings. It can mean the temporal distance between two events, as when someone says "long time no see" or the duration of an event, as when we ask how long does a football match last (i. e. how much time); but it can also mean the temporal position of an event, as when we say about someone being punctual that he or she has arrived on time.

Secondly, we must distinguish between time in the physical sense and time in the psychological sense. Time in the physical sense is public time: what a clock is supposed to measure. Time in the psychological sense, on the other hand, is what we might call subjective or phenomenological time. Strictly speaking, the metaphysics of time is concerned with public time, while the phenomenology of time and the metaphysics of time perception are concerned with private or subjective time. A good theory of time must be able to explain what the perception of time consists of, but it is important not to mix things up. The substance of the debate we will try to present in this paper could be summarized by the following question: what is the present, the past and the future, and what distinguishes them?

In metaphysics of time, the object of philosophical controversy is what we have called public time and the main discussion is about how to characterize the temporal positions of events. In a necessarily simplistic way, we can characterize the debate as a dispute between two theories: the A-theory and the B-theory.[1] According to the A-theory, an ontological distinction can be drawn between past, present and future: the fact that there is a constantly changing moment of present time is an objective and irreducible fact. The main motivation for this theory is that time is in some sense dynamic: present events were future and will be past. Since the present is constantly changing, the temporal properties (*presentness*, *pastness* and *futureness*) of events, also called A-properties, are also constantly changing.

According to B-theory, however, we can make a distinction between past, present and future, but only from a concrete temporal perspective: from an ontological point of view, all events exist equally. Temporal properties are not monadic but dyadic or relational: the Peloponnesian War was present in

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[1] There are currently several theories that could be included in what we will call the A-theory and the B-theory in this paper. At the extreme end of the A-theory would be presentism, the theory according to which only the present exists, but there are also hybrid theories that are often characterized as versions of the A-theory. B-theory, on the other hand, can be presented as a single theory characterized by the fact that there is no objective distinction between present, past and future.

Plato's time but in Aristotle's time it was part of the past. According to this theory, the temporal relations between events (earlier than, later than and simultaneous with), also called B-relations, are what constitute time. In this sense, the B-theory is often accused of having a static conception of time because the temporal relations between events do not change.

The names "A-theory" and "B-theory" derive from McTaggart's paper mentioned above in which he argues that time does not exist and that the temporal order of events is an illusion. His analysis of time and his argument will be our main concern in the following pages and this will help us to elucidate most of the concepts we have just mentioned.

2. McTaggart, time and change

John-McTaggart Ellis McTaggart was an idealist philosopher considered one of the most important English Hegelians and a leading figure of British idealism in the 20th century. As we said in the introduction, this philosopher is famous for arguing that time is not real. He develops his argument in a paper named "The unreality of time" published in 1908 in Mind. But the same argument also appears in chapter 33 of his book "The Nature of Existence", published in 1927, where he responds to the objections of Bertrand Russell and C.D. Broad.

McTaggart wants to argue that time does not exist, but to do so he first has to propose an analysis of this concept. The London philosopher conceives of events as substances that occupy a place in time.

> " The contents of any position in time form an event. The varied simultaneous contents of a single position are, of course, a plurality of events. But, like any other substance, they form a group, and this group is a compound substance. And a compound substance consistent of simultaneous events may properly be spoken of as itself an event. (McTaggart 1927: 10)

McTaggart distinguishes between two ways of referring to the temporal position that events occupy in time. The first is timeless: once we have fixed

the date of the event, its temporal position does not change. The second refers to a moment in time, the present, which seems to change constantly. In fact, in our everyday life we speak of events in both ways indistinctly: when, for example, we refer to the death of Bertrand Russell, we can say that it happened 53 years ago, i.e. that this event is 53 years behind the present moment – 2023 –, or we can say that his death occurred in 1970, i.e. that this event is 1970 years after the birth of Christ, the event stipulated to number the years in the Gregorian calendar. Note that the first statement –"B. Russell's death happened 53 years ago"– is only true when it is uttered in 2023, and therefore reflects the dynamic feature we attribute to time. On the other hand, the second statement –"B. Russell's death occurred in 1970"– has a timeless character: its truth value does not change.

Making a show of originality, McTaggart called the sequence of events formed from the first ordering 'B-series', where the position of an event depends on whether it is earlier, later or simultaneous with respect to the other events, and the sequence of events formed from the second ordering 'A-series', where events are characterized as being present, past or future. Thus, when we speak of the B-series we will use the term 'B-relation' to refer to relations of earlier than, simultaneous with or later than while when we speak of the A-series we will use the term 'A-property' to refer to the property of an event to be present, past or future.

The terms 'A-series' and 'B-series' can be ambiguous. McTaggart uses them to refer to both the way of (temporally) ordering a sequence of events and the way of (temporally) ordering a sequence of moments of time, so it is useful, following Mellor (1998), to differentiate events from the moments of time in which they occur. We will therefore use the terms 'A-scale' and 'B-scale' to refer to the ordering of moments of time that may include several events.

Thus, what characterizes the A-scale is that the moments of time are ordered in relation to a present moment of time. The B-scale, on the other hand, is characterized by the relations of earlier than and posterior than between each moment of time.

Having made this distinction, the first thing we can see is that the A-scale and the B-scale are isomorphic: once we fix which B-moment is present, the

temporal relations that generate the two scales are exactly the same. If today is the 2nd of January, today is a day after yesterday in the same way that the 2nd of January is a day after the 1st of January. This example shows on the one hand that the relations of earlier than and posterior than are not exclusive to the B-scale and, on the other hand, that although any event must be present, past or future, the A-scale allows for finer temporal distinctions to be made by means of linguistic resources such as tenses or temporal adverbial expressions.

However, although there is only one A-scale and one B-scale, these scales can generate several different series depending on which reference system we use: according to the theory of relativity, the simultaneity of two events will depend on the observer's reference system, thus generating several B-series and A-series. But leaving aside the relativistic complications, once a reference system is fixed, for example the city of Girona, if we order the events using the B-scale, we can only generate one B-series, whereas if we order them using the A-scale, we can obtain an infinite number of "frozen" A-series: for each B-moment of the first series, we can take a "photograph" of the corresponding A-series in which this B-moment is present. That is, for each moment t in the B-series, we can generate a photograph of the A-series, At, in which t and only t is present. We say that this is a "photograph" because according to McTaggart what characterizes the A-series is precisely that the moment t that is present is never the same. This is why he argues, as we shall see below, that only the A-series can correctly explain the notion we have of change or the passage of time.

According to McTaggart, both the A-series and B-series concepts are fundamental to explaining our ordinary concept of time. Most of the activities we carry out in our daily lives depend on both representations.

Think of an ordinary morning in the life of Maria, a philosophy student. When she gets up in the morning, she knows that it is today, but while she is making a coffee, she sees that on the calendar, on the 12th of this month, there is written: "logic exam". She starts to get nervous and goes to look for her mobile phone to find out what day it is today. The two representations, separately, are of no use to her: what she needs to know is whether today is

the 12th. Now, although we often represent the temporal ordering of events indifferently one way or the other, what characterizes our temporal representation, according to McTaggart, is that it is dynamic. Thus, our representation of the passage of time consists of a combination of the two series: we can represent the passage of time as if the B-series were moving over the A-series or as if the A-series were moving over the B-series. Let's imagine that we have a calendar on the fridge and we use a small magnet to represent what day it is today. The first case would be to leave the magnet fixed and move the calendar; the second case would be to leave the calendar fixed and move the magnet. Either way, the idea of time is always accompanied by the idea of change.

> " The movement of time consists in the fact that later and later terms pass into the present, or –which is the same fact expressed in another way– that *presentness* passes to later and later terms. If we take it the first way, we are taking the B-series as sliding along a fixed A-series. If we take it the second way, we are taking the A-series as sliding along a fixed B-series. (McTaggart 1927: 10)

Thus, what is impossible to doubt, according to McTaggart, is that the idea of time implies the idea of change, so the B-series cannot constitute, exclusively, the concept of time. The position of B. Russell's death in the B-series does not change: the B-series is static, and the same reasoning can be applied to the B-moments, so that the passage of time is inexplicable. On the other hand, if we consider the A-series, by virtue of its dynamic character, this same event constantly changes its A-properties: before it happened, it was future, less and less, until on 2 February 1970 it became present, and since then it is past and recedes as the present advances. Therefore, change can only be explained by the A-series: events can only change by gaining and losing A-properties since their B-relations do not change.

According to McTaggart, the temporal relations 'earlier than' and 'later than' of the B-series depend on the dynamic character of the A-series: the B-relations depend logically on the A-properties, i.e. it is in virtue of the A-scale that we can conceive of events ordered according to the B-scale. As we shall

see, according to the latter, the A-series has logical and metaphysical priority: what is given to us is the experience of the present, and it is from this that we are able to make the abstraction of a B-scale.

On the other hand, according to Russell's analysis, the existence of the A-series is not necessary for there to be change. Change consists in an object having different properties at different points in time: the subjects of change are not the events but the objects.

> " Change is the difference, in respect of truth or falsehood, between a proposition concerning an entity and the time T, and a proposition concerning the same entity and the time T', provided that these propositions differ only by the fact that T occurs in the one, where T' occurs in the other. (Russell 1903: 469)

What explains the change of colour of an apple is not that its redness is future and becomes present but that the proposition "the apple is green" is true at one moment of time, t1, and false at another moment of time, t2. The change of colour of an apple is that it is green at t1 and red at t2. But according to McTaggart, Russell's analysis does not capture the concept of change because if we accept that the apple is green at t1 and red at t2, these facts are immutable. Change is only possible if facts change, and the only characteristic that can change in a fact is its position in the A-series, it's A-property. Moreover, Russell's analysis cannot formally distinguish temporal variation from spatial variation. McTaggart (1927, p.15) compares the B-series with a spatial series such as the Greenwich meridian. It would not be difficult to find two points in this spatial series, S and S', such that the proposition "S lies within the United Kingdom" would be true and "S' lies within the United Kingdom" would be false. There is a part of the meridian that lies inside the UK and a part that lies outside, but this does not mean that the meridian changes.

McTaggart's criticism is that the B-series is static and that, therefore, only the A-series, which is dynamic, can constitute change.[2] According to him the A-series is more basic than the B-series, whereas for Russell (1915) the dependence is reversed: if we can say that an event is past, present or future, it is because this event is prior, simultaneous or subsequent to some object of direct experience (sense-data). If there were no conscious subjects in the universe there would be no such thing as present, past and future, but events would be equally (temporally) ordered according to the relations of earlier than, later than and simultaneous with. The existence of the B-series would be objective while that of the A-series would be subjective.

3. McTaggart's argument

By now, we have enough knowledge on the subject to formally state Mctaggart's argument:

1) Time is real only if there is change.

2) There can only be change if the A-series exists.

3) The A-series is contradictory.

4) Therefore, time does not exist.

So far we have stated premises 1 and 2. The second part of the argument consists of showing that the A-series is contradictory, that is, that the attribution of what we have called A-properties (*presentness*, *pastness* and *futureness*) ends up implying a contradiction.

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[2] Some contemporary defenders of Russell's theory, called R-theory, such as Tegtmeier (2007) or Oaklander (2014), say that this critique is incoherent: if time is the dimension of change, then time cannot change. According to this theory, events are not to be found in time, but time is what emerges from the temporal relations (earlier than, later than and simultaneous with) between them. Precisely because these relations are primitive, it is no contradiction to say that these relations are the basis of dynamism: what a theory of time must do is to analyse dynamism, not to dynamise the analysis.

McTaggart begins by saying that the characteristics of being present, past or future can be understood as relations or qualities attributed to events or moments of time, but that their paradox is independent of which option is chosen. He observes that the three A-properties (*presentness*, *pastness* and *futureness*) are incompatible: if an event is past, then it is neither present nor future; if it is present, then it is neither past nor future; and if it is future, then it is neither present nor past. But in the A-series all events have all three determinations.

> " Past, present, and future are incompatible determinations. Every event must be one or the other, but no event can be more than one. […] But every event has them all. If M is past, it has been present and future. If it is future, it will be present and past. If it is present, it has been future and will be past. Thus all the three characteristics belong to each event. (McTaggart 1927: 20)

McTaggart then advances the answer of a possible opponent according to which there is no contradiction: events cannot have all three determinations simultaneously but there is no problem if they have them successively. We do not say that an event M is present, past and future; what we say is that M is present, will be past and was future. But what is the meaning of the conjugations 'is', 'was' and 'will be'? According to McTaggart, when we say that X is Y we are saying that X *is* Y at a moment of present time; when we say that X was Y we are saying that X *is* Y at a moment of past time; and when we say that X will be Y we are saying that X *is* Y at a moment of future time.[3] So what we are saying of M is that it *is* present at a moment

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[3] As Aristotle said, 'being' is said in many ways. In these cases, even that we are dealing with the present tense of the verb 'to be', we must treat the copula in a tenseless sense, that is, in the sense we use to attribute properties to abstract (and tenseless) entities as in the propositions "The number 2 is even" or "Red is a colour". The truth value of these propositions does not change over time, unlike propositions such as "Donald Trump is the president of the United States" or "Ron is bald". When the reading may

of present time, that it *is* past at a moment of future time and that it *is* future at a moment of past time.

> " But every moment, like every event, is both past, present, and future. And so a similar difficulty arises. […] And thus again we get a contradiction, since the moments at which M has any of the three determinations of the A series are also moments at which it cannot have that determination (McTaggart 1927: 21)

In other words, all we have done is moving the problem to moments of time: to solve the problem of the incompatibility of the three A-properties attributed to the same event, we try to relativize these A-properties to moments of time. But this move leaves us again in a dead end, as we will show below.

One way to see how McTaggart's paradox arises is from the reformulation of the ordinary problem of change: how can the same thing have incompatible intrinsic (non-relational) properties such as "being totally green" and "being totally red"? In McTaggart's case, the question is: how can the same event have incompatible intrinsic (temporal) properties such as "being present", "being past" and "being future"?

For Russell, the paradigmatic subjects of change are objects, while for McTaggart the subjects of change are events. As we have seen above, Russell's answer is that the change of colour of the apple consists in the fact that both properties are exemplified at two different moments of time: the apple is green at t_i and red at t_j (where $i<j$). It is true that the fact that the apple is green at t_i and the fact that the apple is green at t_j do not change, but this does not mean that these facts cannot constitute the colour change of the apple. But according to McTaggart this analysis of change is incorrect: what explains the change of the apple's colour is the change of the temporal properties of the two events corresponding to the apple's being green and being red, i.e., its change of position of these two events in the A-series. In

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be ambiguous, we will use the notation '*is*' to indicate that the copula is being used in a tenseless sense.

fact, this is the conception that follows from ordinary language when we say that the apple is green and will be red, and after a few days we say that the apple was green and is red. As we have seen, McTaggart appeals to the change in the A-properties of events to explain the change in the intrinsic properties of objects, but the same problem resurfaces with respect to the events themselves.

What characterises A-properties is that they are temporally changeable: an event M which is now future, becomes less and less future, until for an interval of time it is present, and then it becomes past and recedes into the remote past. But this concept of change implies a contradiction. Let us imagine that a future event becomes present. We symbolise the change of temporal property that event M has undergone as:

i) $F(M) \wedge A(M)$

As we have seen, this statement is contradictory because these two determinations are incompatible ($(F(M) \vDash \neg A(M)) \wedge (A(M) \vDash \neg F(M))$). Then, to try to solve the problem we relativize the A-properties to moments of time, so i) is reformulated as:

ii) $F(M,t1) \wedge A(M,t2)$

But what we have in ii) is a B-series: what it is telling us is that M is posterior to t1 and simultaneous with t2. That M *is* future at t1 and that M *is* present at t2 are *tenseless* truths and McTaggart has already rejected above (against Russell) that this analysis is adequate.

Once we have ruled out the explanation of the A-properties on the basis of absolute moments of time, i.e. which remain unchanged, and are therefore ordered with respect to the B-scale, we have no choice but to order the moments of time with respect to the A-scale, but then the incompatibility resurfaces, because each of these three moments of time must also have the three A-properties.

Let us look at the case where M is present. When we say that M will be past we are saying that M *is* past at a future moment in time t3. Now, since the A-series is dynamic, when M is past t3 it will be present, and when M is

further past, t3 will be past. Therefore, we have that t3 also has the three incompatible A-properties. Again, it can be argued that t3 is past, present and future at different moments of time, but each of these moments will also have the three properties. Any attempt to eliminate the contradiction forces us to relativize the properties to moments of time that also have the three properties, so that the analysis becomes a regression to infinity.

Another way of expressing the paradox is the following: suppose that events have the properties of "being past", "being present" and "being future".

What are the criteria that allow us to distinguish them? The property "being past" is exemplified by all events earlier than the present moment, the property "being present" is exemplified by all events simultaneous with the present moment, and the property "being future" is exemplified by all events later than the present moment. But this distinction is only possible if we fix a moment of time, making a "photograph" of the A-series corresponding to a B-moment. As soon as we try to adjust the idea of change genuinely represented by the A-series, the distinction between past, present and future collapses because we cannot fix any moment from which to draw the distinction.

McTaggart's argument has been rejected by most philosophers, but disagreements have arisen as to which premises should be rejected. On the one hand, A-theorists accept the second premise (that change can only be explained by the A-series), but reject the third (that the A-series implies a contradiction). On the other hand, B-theorists accept the third premise, but reject the second.

According to Dummett (1960), there is an implicit premise in McTaggart's argument: that there must be a complete description of reality independent of any perspective and that we can only say that something is real if we can make it an objective description. In the same way that we can only see an object from various perspectives in space but can describe it "objectively" by a three-dimensional description independent of the angle from which we look at it, McTaggart believes that if time were real an objective description of temporal reality should be possible, that is, a temporal description of events independent of the temporal position from which it is made. But this

presupposition together with the idea that only the A-series can correctly describe temporal reality implies that if time is real, then the complete description of reality must contain incompatible facts, such as that any event M is present, past and future. Dummett's conclusion is that McTaggart's argument should make us abandon the prejudice that there can be a complete description of reality. We should accept that we can only make a maximally consistent description of reality from a particular temporal perspective. Dummett does not go further, but his reflection seems to argue in favour of presentism.

Indeed, a similar argument is used by presentists to avoid the paradox. According to the presentist, we can only make a description of the present state of the world, therefore, his theory is not affected by McTaggart's paradox. In the words of Craig:

> " On a presentist ontology, to exist temporally is to be present. Since presentness is identical with temporal existence (or occurrence) and existence is not a property, neither is presentness a property. Presentness is the act of temporal being (2000: 202)

According to the presentist, McTaggart's argument is fallacious because it treats becoming as if it were a kind of qualitative change and translates the conjugation of the verb "to be" in the present tense by a timeless copula accompanied by a temporal adjective. Firstly, in a presentist ontology past and future events or moments of time do not exist and therefore cannot exemplify properties such as "being past" or "being future". The paradox arises when one adopts a B-series ontology according to which all events and moments of time exist equally and attempts to attribute A-properties to them. McTaggart conceives of events as existing out of time by gaining and losing temporal properties, but according to the presentist the idea that follows from the A-series is only that events simply happen: they exist while they are present until they cease to exist. Thus, the contradiction lies not in the A-series itself but in McTaggart's representation of temporal becoming, where he conflates the A-series with the B-series.

Secondly, the presentist does not accept McTaggart's translation of the temporal copula. As we have seen, he translates "M is present" by "M *is* present in a present moment of time". But then what his translation says is: "There is a moment t, in which M *is* present and t is present". If we treat the second copula as tenseless, we have the paradox again, but according to the presentist, McTaggart is not justified in taking this step, so we can alternatively analyse "t is present" as "t *is* present at a present moment of time", but this means: "There is a moment t', in which t *is* present and t' is present". Every time we want to reduce the temporal copula to a tenseless copula we get a new temporal copula and so on ad infinitum. According to the presentist, what the argument shows is not that the A-series is incoherent but that the grammatical tense, and therefore the reference to the present, is irreducible.

The presentist solution, then, seems to escape McTaggart's paradox, but it presents other problems, such as demonstrating that a metaphysics consistent with the idea that only the present exists is possible.

Unfortunately, dealing with these questions would take us too far and we are running out of time.

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5. Short biography

Sergi Tauler holds a Bachelor's Degree in Philosophy and a Master's Degree in Language and Teaching focused on Catalan and Spanish treated as Second Languages, both from Universitat de Girona. After graduating, his career has been directed towards the education sector by teaching Catalan to adults, especially newcomers and low-resource-household students. Despite that, philosophy has never ceased to be an important part of his work.

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