What Would Be Required for Large Scale Acceptance of Block Time?

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Abstract: It is argued that, if a future confirmed physical theory were to show that belief in Dynamic Time is mistaken, a majority of people in Western countries would still hold this belief. Reasons are offered as to why this is so, together with the types of evidence that would be necessary to convince most people that Dynamic Time is incorrect.

Keywords: Block Time, Dynamic Time, structure of time, temporal beliefs, types of evidence.

1. Introduction

The two broad realist theories about the nature of time are called Dynamic Time (also known as the A-Theory of time and Tensed time) and Block Time (also known as the B-Theory of time and Eternalism). The debate over these two theories has a long history and currently shows no prospect of resolution in the short term (cf. Dyke 2021, 2-3).

In Block Time, all events tenselessly exist, the present moment does not have any special ontological status and there is no objective passage of time (Dainton 2010, chap. 3; Dyke 2021, chap. 5). What appears to be past, present, or future is purely subjective. Consequently, Block Time would appear counter-intuitive to most people. Nevertheless, Block Time explains much about the universe and fits neatly into the context of physics. Indeed, Albert Einstein once commented: "For we convinced physicists, the distinction between past, present, and future is only an illusion, however persistent …" (Einstein quoted in Greene 2004, 139) Block Time is not generally well-known beyond academic / scientific circles and is mainly held by physicists and about half the philosophers of time / metaphysicians.

Dynamic Time postulates an opposing position to Block Time where there is a physical passage of time, an objective present moment, and time is tensed, i.e. there are ontological differences between past and future (Dainton 2010, chap. 6; Dyke 2021, chap. 4). Moreover, the past is fixed and the future is open. The present moment is that time where we experience the physical world around us and causally interact with it. Various ideas about the 'dynamic' nature of time have led to there being more than one version of Dynamic Time, but we shall just refer to these versions collectively under the generic label of 'Dynamic Time.'

It is a pragmatic fact of life that, irrespective of the actual structure of time, human beings live day-by-day, every single day without exception (Gregory 1999,

259; Droege 2009, 78; Fingelkurts and Fingelkurts 2014, 1; Dorato and Wittmann 2015, 192). Although we remember our past and anticipate our future, consciousness (and therefore the conduct of our lives) resides in the mental present (McKinnon 2003, 305; Le Poidevin 2007, 76; Dainton 2008, 362; Dorato 2023, 182-183). We have *no choice* in this aspect of our lives, regardless of our intuitions, cultural backgrounds, ethnic origins, religious beliefs, lifestyles, and personal wishes. There is nothing we can do which will alter this feature of our existence, i.e. that we mentally inhabit only the present moment.

Our conscious existence being lived out in the present moment not only looks utterly evident to the individual person, there are also other indicators in favour of each of us only residing in the mental present. These include the recorded experiences of people who have: partaken in space flight; lived for long periods off the Earth (e.g. aboard the International Space Station); awoke from a long-term coma; engaged in deep, extended periods of meditation; and lived totally isolated from others without most of the ordinary daily stimuli. All continue to mentally inhabit only the present moment. We also *seem to feel* that there is an irresistible passage, flow, or advance of time from past to future (Evans 2003, 7; Greene 2004, 129; Klein 2007, xviii; Prosser 2007, 75; Price 2011, 276; Wittmann 2014, 507; Nahin 2017, 116; Young 2022, 2628), again irrespective of time's actual structure.

Also, in the absence of effective anti-ageing drugs, we all continue to get physically and mentally older with every subsequent moment of time. Nature forces these constraints and feelings upon us. Indeed, since the passage of time appears to bring about the happening of all events, if daily experience did *not* include the impression of time passing, the conduct of human behaviour would be distinctly different from what we find it to be, for actions might seem causally inefficacious and/or pointless.

In this article, it will be argued (and supported by evidence) that most people, at least in Western countries, hold to a basic version of Dynamic Time. The issue that will then be addressed is what would be required to change the opinion of the majority about time from Dynamic Time to Block Time.

2. Belief in a Rudimentary Conception of Time

The feelings and constraints on our lives have led to a belief in a rudimentary conception of time by most people in Western countries. In this conception, the present is a special moment of time and it continually progresses towards (what we call) the future, i.e. time passes, as Dyke and Maclaurin have described:

> It is a widely held folk belief that time is tensed. That is to say, it *is widely, and pre-theoretically believed* that there is an ontological distinction between past, present, and future, and that time is dynamic, and furthermore that these two features of time exist independently of human experience. (2013, 528, italics added)

The holding of a belief in this rudimentary conception of time by a majority will be substantiated below in several ways.

In today's modern world, we find that time is the 'dictator' of our daily activities and more so than in any other era in human history (Hammond 2012, 19). We all have appointments to keep, travel to undertake, responsibilities to manage, meetings to attend, planning for our future, etc. in addition to the necessary daily activities of eating and sleeping. The human faculty to take action on matters which are merely future possibilities, to plan for later contingencies, and our capability to accurately measure time (by our clocks and calendars) has enormous practical utility, for this allows us to orderly regulate our daily activities, our society, and (to some extent) global events (cf. Callender 2017, 1-2). This on-going practical aspect of time *reinforces* to most people that the rudimentary conception of time is essentially correct.

The rudimentary conception of time is just the pre-analytic and not model specific version of Dynamic Time, which goes by several names, including: accepted view of time; natural view of time; and the folk belief of time. We will refer to it as 'Basic Dynamic Time.' There have been some selective surveys undertaken in recent years with the aim of drawing conclusions about commonplace attitudes towards time by gaining empirical data from chosen groups of people (e.g. Shardlow et al. 2021; Norton 2021; Latham and Miller 2023). None of these surveys can be accepted at face value for they can suffer from an assortment of malaises which adversely influence the data obtained, their interpretations, and inferences drawn from them.

Indeed, the objectivity and correctness of any inferences made from such surveys depends crucially on a number of quite different factors. The relevant factors include the following:

- the number of participants – obviously, a small sample size is unlikely to provide results which are representative of wider society;
- the traits of the survey participants – especially their motivations for participating in the survey, financial circumstances, education levels, social status, ethnicity, and religious beliefs;
- how the survey questions themselves are phrased and presented – these can be written and ordered to increase the likelihood of getting particular responses (a technique widely employed in political surveys to obtain desired results);
- whether individual models are included (or suggested) within a survey – this would tend to undermine the capacity of a given survey to ascertain pre-analytic conceptions.

In order to determine whether surveys produce any genuine findings (and therefore are suitable to make inferences from), detailed analysis of not just the methods employed in conducting the survey but also of the actual questions asked with respect to the factors listed above is required for each individual survey.

Unless all this is rigorously done and presented along with the survey results, the validity of any inferences made is not assessable.

The other important realisation is that the assertion that a majority does not believe in Basic Dynamic Time (as claimed or suggested in the inferences made from some recent surveys) *conflicts* with the widely accepted idea that most people do share a feeling of time passing and accept the present as a privileged moment of time. This majority belief is confirmed by both contemporary anecdotal evidence (e.g. see: Evans 2003, chap. 1; Greene 2004, 128; Dainton 2010, 28-29; Hammond 2012, 6; Bardon 2013, 95; Harrington 2015, 133; Callender 2017, 226; Torrengo 2024, chap. 5) and a huge amount of historical evidence found in dramatic plays, songs, poetry, oral and written stories, and figures of speech. This evidence cannot be ignored nor sidelined, since it provides a clear indication that most people in Western civilisation do hold to a belief in Basic Dynamic Time. Moreover, both the fact that we all live day-by-day and time's practical aspect contribute to an on-going belief in Basic Dynamic Time.

In response to those who would deny that there is a large scale belief in Basic Dynamic Time, consider what would follow if this were *not* the case. First, there are the numerous mentions of the notion that time continually passes in literary fiction (including science fiction / fantasy), songs, and poetry, not only in this century but going back hundreds (if not thousands) of years. One notable example is found in the poem 'The Hero as Divinity' by Thomas Carlyle, who wrote:

> The illimitable, silent, never-resting thing called Time, rolling, rushing on, swift, silent, like an all-embracing ocean-tide, on which we and all the universe swim like exhalations… (1841)

Such writings would not exist if there was not a large scale belief that time passes.

Second, there would not be the myriad of everyday sayings which capture aspects of Basic Dynamic Time, sayings which are all too familiar. Examples of some of the most recognisable ones are: 'time flies;' 'as time goes by;' 'time drags;' 'time marches on;' 'the time just flew by;' 'time moves slowly but passes quickly;' 'the present time is our own;' 'no time like the present;' 'all you have is this moment;' 'live for the moment;' '*carpe diem*;' 'for the time being;' 'time is closing in;' 'time waits for no one;' 'time's up;' and 'in the fullness of time.' (An internet search will find many, many more.) These are not vacuous phrases – they are expressions of what human beings believe are part of daily experience. If there was not a large scale belief in Basic Dynamic Time, these phrases would not have been created, nor would they continue to be extensively used today.

Third, it is commonly thought that clocks actually measure the passage of time, as a suitable internet search will demonstrate (they do not – see Section 6 for more on this issue). However, in order to believe that clocks do measure time's passage, a prerequisite is to believe that time does pass! Consequently, if there was not a large scale belief in Basic Dynamic Time, then most people would not think that clocks measure time's passage, contrary to this prevailing view.

What the above line of reasoning illustrates is that Basic Dynamic Time does deeply penetrate into Western thought. A large scale belief in Basic Dynamic Time should not be unexpected and seems entirely evident since conscious experience provides an apparent justification for believing that we exist in the present and for the belief that time passes (see: Dainton 2010, 28; Harrington 2015, 18; Prosser 2016, 22-23; Callender 2017, 226; Gołosz 2022, 68-69). Attempts to show that a majority in Western society do not believe in Basic Dynamic Time are simply wrong-headed.

3. The Troubles with Dynamic Time

It is occasionally claimed that relativity theory shows that Dynamic Time cannot be the correct ontological structure of time. Relativity theory informs about metrical characteristics of time but not time's ontological structure. Although relativity theory does place restrictions on the structure of time, it has not been shown to completely rule out Dynamic Time (see: Dieks 2006; Crisp 2007). Moreover, popular accounts of Special Relativity's time dilation effect frequently depict time as 'slowing' when objects are in high speed relative motion, i.e. that the passage of time has different rates in separate frames of reference. Strictly speaking, relativity theory only shows that the *duration of time intervals* between two specified events can vary. The assertion that time slows down is not part of relativity theory and is appended to the theory in popularisations in order to make explanations of relativistic effects appear more in line with our daily experience of time.

There are some grave issues which count against Dynamic Time. If Dynamic Time were a correct description of time, then its features should appear in the fundamental equations of physics. Yet, there is no parameter for any passage of time in the fundamental equations (Morris 1985, 209; Al-Khalili 2012, 85; Callender 2014, 15). Nor do these equations contain any term for an objective present moment (Denbigh 1981, 4; Greene 2004, 131; Buonomano 2017, 114).

There are also a number of well-documented logical problems with Dynamic Time. These problems include how to characterise the rate of the passage of time without contradiction and how to define the present moment without reference to itself (see: Price 2011; Smith 2011; Leininger 2015; Prosser 2016, chap. 2; and Dyke 2021, chap. 4). Heather Dyke has summarised the predicament over Dynamic Time as follows:

Time, from our anthropocentric point of view, has a privileged present moment and a dynamic quality. Attempting to incorporate these features into the objective account of time, as the A-Theory [Dynamic Time] tries to do, leads to insurmountable problems. (2021, 67)

The above mentioned issues suggest that, despite the 'living-in-the-present' aspect of our conscious existence, Dynamic Time will ultimately be found to be an *incorrect* description of time. This finding would not, by itself, tend to lead to any

wholesale conversion to a belief in Block Time as our day-by-day experience of life would be unaffected (more on this below).

If Dynamic Time is eventually found to be incorrect, what would be required for acceptance of Block Time by the general public? This is (primarily) an *epistemic* question to which a partial answer will be provided. Let us suppose that a future physical theory shows unequivocally that Block Time describes the physical structure of time and this theory is highly confirmed at the empirical level. It would then be the case that belief in Dynamic Time would be mistaken. Nevertheless, Dynamic Time is so ingrained in everyday thought processes that a majority of people in Western society *would still believe* in Basic Dynamic Time irrespective of any confirmed physical theory. Why this is so and what it would take to convince most people that Dynamic Time is not the way that nature operates will be addressed in the next two sections.

4. Why Is This So?

Those who accept Basic Dynamic Time would still cling to it even in the face of a verified physical theory to the contrary, i.e. most people who explicitly believe in Basic Dynamic Time would continue to do so. This situation is attested to by many similar episodes throughout history where long-held views have prevailed over empirically well-supported explanations. Prominent examples include the views that: the surface of the Earth is flat; the Earth is immobile; the Earth is at the centre of the cosmos; all motion requires a 'mover;' heavy objects fall faster than light ones; human flight is impossible. These views continued to be embraced years after the evidence against them became overwhelming.

If readers doubt that these historical examples are relevant to the case of the majority current view about time, then consider a contemporary example of a theory that is held on mass despite there being a contrary scientific theory which has massive amounts of evidence in its favour. This example is that of Creationism. We find today that millions of people (particularly in North America) believe in Creationism, i.e. the theory that there is a supernatural being who created all life on Earth, especially human beings. This theory is based purely on faith as there is no credible evidence supporting Creationism. The scientific theory that explains life in natural terms is Evolutionary theory for which there is vast evidence, as the notable palaeontologist Tim White has concisely stated:

> There are now tens of thousands of fossils in museums around the world supporting our current knowledge of the human evolution. …All models, all myths involving the singular, instantaneous creation of modern humans fails in the face of this evidence. (2006, 79-80)

Nevertheless, ordinary people in their millions remain passionately committed to Creationism. Why? The principal reasons are well-known and include: a desire to make sense of existence in terms of 'something bigger' than

mere humanity; to endow a special status to human beings; to provide for the need for an external purpose for one's life; and to be part of a grand scheme.

We may likewise specify that the current everyday majority attitude towards time, i.e. a large scale belief in Basic Dynamic Time, is ascribable to (at least) the following four reasons:

(i) Events progressively come-into-being (i.e. are actualised), a process called 'becoming;'

(ii) Real changes occur;

(iii) Human beings have free-will; and

(iv) The future can be affected but not the past.

These reasons are recognisable as generally shared views (at least in Western countries) about everyday human existence.

The usual justifications for the reasons (i) – (iv) are as follows. Belief (i) is warranted because we seem to directly experience 'becoming' and this experience is so compelling to many that any denial of 'becoming' is taken as ludicrous. Belief (ii) is justified because we find that there is novelty in the world, i.e. new phenomena do constantly occur. Belief (iii) must be correct for otherwise Fatalism would be true, i.e. future events would be completely determined and could not be otherwise. This cannot be the case since it is contrary to the fact that we observe that people can and do make free choices between genuine alternatives. Belief (iv) is justified for we perform actions in the present in order to bring about some events in our future (and succeed in doing so), but not past ones.

We acquire the above listed reasons (at least implicitly) in progressing from childhood to adulthood and these exert an intense grip on the majority as they appear to be required for the conduct of our daily lives in accordance with the feelings and constraints imposed by nature (as set out in Section 1).

5. What Would It Take?

Could logical argument settle the issue? Let's briefly consider Belief (iii), for the issue of free-will is one that resonates more than others, since the possession of free-will is taken as an unquestioned fact by most people in Western society. Many of those who are aware of Block Time think that, if Block Time were correct, then Fatalism must also be the case. Therefore, it is especially important to acknowledge that Block Time does not imply Fatalism and that free-will and determinism are compatible (Compatibilism). Adrian Bardon writes in his monograph on the history of philosophy of time that:

> [C]ompatibilism can also be employed against the metaphysical fatalism derived from the static theory of time [i.e. Block Time]: We can distinguish between timelessly existing events in which human intentions play a role and ones in which they do not. …[W]e can *affect* the future; we can distinguish between

> events that are brought about by human intentional action and ones that are not. (2013, 149, italics in original)

The existence of free-will, then, does not require that Dynamic Time is the case (Prosser 2016, 198; Dyke 2021, 49).

In light of the combined weight carried by the commonly held reasons (i) – (iv) outlined in Section 4, no logical argument nor any physical theory (together or by themselves) is going to convince most people that Basic Dynamic Time is false. What is needed is *evidence* but, as the saying goes, 'extraordinary claims require extraordinary evidence' and a suitable time period for such evidence to 'sink in' to the collective human mind-set. What evidence would be convincing to the general population at large? The evidence falls into two broad categories – 'knock-down' (directly convincing) and 'gradually persuasive' (convincing over time).

What's different about these two categories? A piece of 'knock-down' evidence would constitute a refuting instance to the relevant theory and also a confirming instance to its rival. On the other hand, a piece of 'gradually persuasive' evidence would not constitute a refuting instance, just a confirming instance. The latter evidence would, therefore, only assist a theory gaining acceptance by the accumulation of instances over some time interval (which may be quite long). There is also a second possibility for what constitutes 'gradually persuasive' evidence, because evidence is not discovered in a conceptual or social vacuum. It could be the case that what ought to be considered 'knock-down' is instead only considered in the 'gradually persuasive' category due to prevailing beliefs or other factors.

Another historical example may assist in clarifying this second possibility. In 1609, telescopic observations by Galileo Galilei empirically established the phases of the planet Venus and the existence and motions of four moons of the planet Jupiter. These discoveries should have been sufficient to immediately convince advocates of the Aristotelian (Earth-centred) worldview that it should be rejected in favour of the Copernican (Sun-centred) worldview (see: Cohen 1985, 71-79). History records that the reception of these discoveries varied across the world and that the rejection of the Aristotelian worldview did not immediately occur, but rather took many years. Why this was the case was primarily due to the exercise of the religious authority of the Vatican over the beliefs of Western society. Only the progressive accumulation of more and more telescopic observations of celestial phenomena together with advances in astronomical theory eventually overcame the dictates of the Vatican.

Let us consider the possibilities for convincing evidence of which the first two are of the 'knock-down' category.

A Traveller from the Future

Time-travel to the past is not ruled out by the laws of physics (see: Earman et al. 2009; Al-Khalili 2012, 121). The General Theory of Relativity allows for closed

paths in spacetime (the relativistic union of space and time), e.g. paths which begin and end at the same location in space and the same point in time. In other words, General Relativity allows for the possibility of travel into one's own past. If a (verifiable) time traveller from the future were to appear, then this would constitute the best evidence for the validity of Block Time, because the future from which the traveller originates *must* tenselessly exist, i.e. a time traveller could not originate from a future which does not exist (Lockwood 2005; Al-Khalili 2012, 127; Buonomano 2017, 10)! There have been attempts to make Dynamic Time compatible with time travel to the past, but these have proved unsuccessful or appeal to exotic solutions which shift the argument into irrelevant territory (see: Bourne 2006, 123; Hales 2010; Markosian 2020; Sakon 2021).

Although time-travel to the past remains a theoretical possibility, it has severe limitations, the biggest of which is practical. This type of time-travel would demand a level of technological development and resources that is barely imaginable today, e.g. being able to 'engineer' space and time. Time-travel to the past is also restricted to times after the mechanism used for the time-travel is constructed.

Communication from the Future

Somewhat more probable than a time traveller from the future would be some sort of physical communication sent from a future time, e.g. by a particle beam which propagates back in time. Along with personal time-travel to the past, sending a message to the past is also not ruled out by the laws of physics. This is an intriguing possibility as there are proposed (in principle) mechanisms for this sort of messaging. The American physicist Ronald Mallett, for example, has designed an apparatus which uses circulating laser beams to create closed paths in time as allowed by General Relativity. Quantum particles (e.g. neutrons) could be sent backwards in time via such paths. The quantum mechanical spin of the particles (which only has two values) could be arranged so that a stream of these particles could convey a message in binary code (see Mallett and Henderson 2008).

Communication from the future also has strict physical limitations and is restricted to times after the mechanism used for sending messages becomes operational. In other words, to get any communication from the future today, one would already have to possess a working back-in-time messaging machine. If a message from a future time was received at some stage and was verifiable, then this evidence would be *on-par* with that of a time traveller from the future in terms of establishing the validity of Block Time.

Let us now look at items in the 'gradually persuasive' category, which requires the accumulation of evidence over time to become convincing.

Travellers from the Past

Both 'forwards' and 'backwards' time-travel are (theoretically) unproblematic in Block Time, as all events tenselessly exist in this view. The time dilation effect of Special Relativity is the circumstance where a time interval between two events as measured by a 'moving' clock is shorter than the time interval measured by a 'stationary' clock. The closer that the speed of light is approached, the greater will be the difference in these time intervals. Consider a spacecraft which takes travellers on a round trip into outer space and back to the Earth at close to the speed of light. The time interval of the round trip for the travellers might be, for example, several weeks, but for everyone else the time interval of the round trip could be several decades. Special Relativity thereby provides a means of one-way time-travel to the future.

While 'forwards' time-travel is currently fictional, special relativistic time dilation is itself experimentally well-confirmed (Faraoni 2013, 22) so that journeys into the future will be possible once ultra high-speed space technology is developed (see Williams 2012, for discussion). Although it has been claimed that 'forwards' time-travel is not completely ruled out in Dynamic Time, the arrival of multiple travellers from the past would validate the actuality of 'forwards' time-travel. This would confirm that the past exists as well as the present. Consequently, the existence of these travellers would help convince many that Block Time is correct.

Veridical Precognition

Precognition is the mental perception of events which will occur later than the time of their perception. Precognition necessitates the existence of future events which are the origins of such perceptions. The occurrence of on-going instances of veridical precognition would establish this phenomenon beyond reasonable doubt and would be unambiguous evidence for the validity of Block Time (Denbigh 1981, 54). However, it is the case that precognition is a topic that has attracted more than its fair share of fraud and improper practices. Although there are experimental results gained by *bona-fide* researchers using suitable methods which are explicable by some form of precognition (e.g. see Bem 2011), at the time of writing, accounting for this data in terms of precognition has not been accepted by the scientific community. Yet, this scenario is far more within the bounds of possibility than 'backwards' time-travel or messages sent from the future.

Subjectivity of the Present

The present moment has a special status for human beings which derives from the 'living-in-the-present' aspect of our conscious existence. We think of the present moment as being privileged because we are only aware of a unique present at any particular time. Establishing that the present moment is purely subjective would constitute evidence that counts in favour of Block Time. Many philosophers and

physicists have vehemently argued for over a century that the relativity of simultaneity requires that there cannot be an objective, global present moment (e.g. see: Price 1996, 14-15; Mozersky 2000, 223). Whilst this is the case, it does not rule out a *locally* defined present moment. However, even if only defined locally, there is no compelling evidence for the objectivity of the present moment.

Further, cognitive neuroscience suggests that human perception of the present moment is highly subjective, i.e. mind-dependent (Wittmann 2014, 512-513; Dorato and Wittmann 2015, 208; Romero 2015, 140-141; Gruber et al. 2020, 784). The acquisition of more evidence supporting the subjectivity of the present would assist in reducing belief in Dynamic Time, as would a greater appreciation of these circumstances.

6. Responding to 'What Would It Take?'

A credible response to the posed question – 'What would it take?' – will require careful assessment of the various types of evidence, e.g. how likely is each type of evidence. There is also another issue which bears on the possible acceptance of Block Time, which is that there are no physical measurements of the passage of time. Indeed, if the rate of the passage of time had been verifiably measured, the issue of whether time passes or not would have been experimentally settled long ago in favour of Dynamic Time (Riggs 2024, 461)!

If there is some kind of physical passage of time, then there would have to be a rate at which time passes. Most philosophers of time accept this point about a rate of passage (Boccardi 2016, 9; Newman 2021, 68). Dynamic Time advocates usually presume that clocks show that time passes and measure its rate of passage. Watching the second-hand of a clock is a prime example of an observation which strengthens the belief that time is passing and that its rate is a measurable quantity. This is a widespread misunderstanding. What is the case is that clocks only measure *intervals of time* (Nerlich 2004, 24; Olson 2009, 447; Franck 2012, 95; Davies 2024, 139). However, the perception of successive positions of the hands of a clock can be explained without reference to time passing (e.g. see: Hoerl 2014; Prosser 2016, chap. 6; Riggs 2017; Gruber et al. 2022; Droit-Volet et al. 2023) but detailing this explanation would take us beyond the scope of the current article.

There being no physical measurements of the passage of time is a matter for public education about what counts as evidence rather than the collection of evidence. We should acknowledge in this regard that accumulating evidence in favour of Dynamic Time cannot be done, as unambiguous empirical confirmation of the (assumed) features of Dynamic Time is *not* possible. The absence of any physical measures of time passing is a fact that needs to become widely known and understood if it is to assist in convincing people that Block Time is correct.

Consider now the two items of the 'knock-down' category of evidence. The first item (A Traveller from the Future), although possible, is so highly improbable that its occurrence must be regarded as effectively zero. The second item

(Communication from the Future) is somewhat more likely than the first, but, until a prototype device for sending messages to the past is actually built, the gaining of this type of possible evidence also remains highly improbable.

Let us move to considering the three items of the 'gradually persuasive' category of evidence. The first item (Travellers from the Past) is completely unlikely in the near future given the current level of spacecraft propulsion technology. A full assessment of the second item (Veridical Precognition) will need to await the results of many more strictly conducted and documented experiments, but the phenomenon of veridical precognition holds the possibility of being substantiated in the not-too-distant future. The third item (Subjectivity of the Present) also has some promise of delivery in the near future, as the number and range of empirical studies in the psychology of time and the neuroscience of time perception are increasing (e.g. see: Arstila and Lloyd 2014; Mölder et al. 2016; Arstila et al. 2019). However, the probability weighting attached to this item will be dependent on the amount of suitable evidence which can be accumulated in the short term.

The acceptance of Block Time will require sizeable volumes of those types of evidence which are likely to be collectable within a reasonable period, i.e. veridical precognition and the subjectivity of the present. Acceptance will also require a general comprehension of the issues involved (e.g. free-will) together with the understanding that no physical devices measure time passing. It might then be expected that, with the accumulation of these types of evidence and an increase in understanding of the relevant issues, we might see a large uptake of belief in Block Time. Alas, the reasons for believing in Basic Dynamic Time are so intensely held that even such circumstances as these would be insufficient to change the opinion of the majority, unless a verified physical theory showing that Block Time is correct also had been obtained and had become widely known.

7. Impacts of Majority Acceptance of Block Time

Finally, consider the impacts of majority acceptance of Block Time. What would *not* be affected by the acceptance of Block Time by the vast majority of people is, obviously, the sensory perceptions of one's local environment, the necessity of living day-to-day (and getting older), the impression that we only inhabit the present moment, and the feeling that time passes. What would be affected? There would be a change of view, for those who previously held to Dynamic Time, about the way the universe is structured albeit at a basic level. This would have no effect on daily life, of course, but would alter the general worldview of the nature of reality. This change in worldview would be even more significant and far-reaching than other major historical shifts in physical worldview, e.g. as occurred in the Copernican and Einsteinian Revolutions.

It is also to be expected that there would be some pronounced impacts on the thoughts of people who struggle to accept Block Time. In particular, grappling with the issues of:

- the concept of personal identity;
- the degree to which choices about one's life are genuine;
- personal responsibility; and
- the need for and/or value of making detailed plans for one's future;

might lead to some form of psychosis. The extent of the distress caused will be varied as this would be dependent on the psychological make-up of the individual and (crucially) on the extent to which Block Time is understood by the individual.

8. Concluding Remarks

Dynamic Time is a view that is so entrenched in Western society that a change in belief to Block Time for the majority would need the following circumstances to come together:

(1) The conceiving and confirmation of a physical theory which shows unequivocally that Block Time describes the physical structure of time.

(2) The acquisition of large amounts of relevant evidence which supports Block Time.

(3) The general public would need to be better educated about the nature and limitations of human free-will.

(4) The general public would need to be better informed about the veracity of evidence.

Only when these four circumstances concurrently come about would we see a change in belief to Block Time for the majority in Western society.

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