

The Role of Consciousness for the Passage of Time A Holistic Approach

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Abstract

The notion of the “passage of time” addresses the experienced fact of motion in time. Depending on the respective viewpoint, we may either say that the conscious now is moving through the once-and-for-all fixed space-time universe, or we may say that the space-time universe is moving through the constant now. In this article I try to explain the “subjective illusion” of dynamical flow on the basis of a static space-time universe as it is suggested by relativity theory. The conceptual toolkit for this undertaking is provided by the philosophy of spacetime holism, which I have suggested as a useful approach to a variety of problems. While the argument has already been developed in an earlier publication from a more technical point of view, this article concentrates on the experiential aspects of the involved concepts.

Keywords: Passage of Time, Space-Time, Holism, Consciousness,

1 Introduction

The first part of the problem of the so-called “passage of time” can be illustrated by a well-known Einstein quote:

“People like us, who believe in physics, know that the distinction between past, present and future is only a stubbornly persistent illusion.”

Taking the story of relativity theory seriously, there seems to be no physical difference between the pain that we experience now, the pain that we experienced yesterday, and the pain that we are afraid of experiencing tomorrow. Among conscious beings, however, there is no big discussion about the fundamental difference between these three cases. Relativity theory leaves us with the picture of a space-time block containing all events of all times sharing the same ontological status. The time dimension reduces to a somehow special, but in principle to just another space axis.

As stunning as this first part of the problem may be, a closer look reveals an even more intriguing aspect: How can there be a “motion in time,” whose existence we so deeply feel, when there is just a once-and-for-all fixed space-time block? Can we even give meaning to “motion in time,” when taking into account that motion is described in terms of speed, and speed means something per time? Do we need the assumption of an additional time axis? What would be the ontological status of this new dimension? Is such an assumption consistent with physics?

Indeed, there are attempts to solve the two aspects of the problem by extending the physical world view, e.g. by assuming an active role of consciousness in the quantum measurement process or by adding an extra time dimension.¹

The solution that I am suggesting is of a different kind: I fully subscribe to the view of a “static” space-time block and try to show how the subjective impression of a dynamical flow can be explained. This endeavor can only be successful, if the classical mistake of “already presupposing what should be explained” can be avoided (e.g. as contained in statements like “Is time a static dimension or a process?”).

Other than in [1], where I brought the argument in a more rigorous way underlining the logical consistency of the assumptions, I will concentrate on making the approach more tangible by detailing its connection to conscious experience. In the following section, I will motivate the worldview of spacetime holism, which has been the basis to tackle other “big” problems, as well.² After that, I will introduce the most important concepts and structural elements by the use of examples. In the final section the pieces are collected and the argument is summarized in a diagram.

2 Why Holism? Why Spacetime Holism?

A holistic worldview could be motivated by the frustration caused by desperate attempts to solve the really interesting problems under a traditional reductionist paradigm. There must be something wrong with the belief in the existence of separable objects and concepts and the possibility to analyze them independently, to study the laws that connect them and to achieve an explanation of the whole by putting all together again. The critics of holistic ideas are very quick to respond that anything else than the reductionist (analytical) method leads to complete arbitrariness.

From my point of view, holism has a lot to do with an attitude: On the one hand we can fully accept that there is a fault inherent in any attempt to formulate perfect concepts and perfect models, but on the other hand we can respectfully acknowledge the quality of most different models in their respective domains. Instead of just switching to a different model whenever one model does not work sufficiently, we should try to relate models to each other in a careful way. This attitude allows us to accept different models as good, although in the final analysis they contradict each other. A useful holistic worldview must provide a toolkit of non-arbitrary concepts which make this kind of interaction between models and disciplines possible. The viewpoint that I developed and applied to a variety of problems is designed to do exactly this job.

While many concepts of spacetime holism can be easily related to other holistic approaches, there is one critical difference: the fundamental integration of space and time. While this integrated view of space and time is fully compatible with relativity theory, it is formulated in a way that allows a common treatment of space and time structures in many domains that have very little to do with physics.

¹ e.g. Franck [2]

² Starting from the representation problem of cognitive science, several philosophical problems have been addressed in [3].

While some of the structural elements and concepts of spacetime holism will be introduced in the following section by the use of examples, there is one idea which ought to be put in front, namely the distinction between inside an outside observer concepts and their relation.

By outside view I mean the ideal of natural science, namely the construction of a God-like perspective of the world, where observation is no longer a physical, interactive process. From the outside, we see things “as they are”. However, all our observations are inside operations, as we ourselves are part of the physical universe, and each observation, in the final analysis, is an interaction between an observer and the thing observed. The concept of spacetime holism is based on the construction of a radical outside view of space and time, or better, of spacetime. While our common view of space can be regarded as a quite good outside view, I will suggest that our view of time is not. The distinction between inside and outside views should not lead us to make a choice about the primacy of the one or the other. Again, as a matter of philosophical attitude, we can accept both and try to relate them to each other by asking two questions: How do we construct outside views from inside measurements and experiences? How can we explain inside measurements and experiences from the constructed outside views?

3 The Structural Elements and Their Experiential Aspects

In the following, I will introduce those concepts of spacetime holism, which are relevant for the argument on the passage of time, by the use of examples which underline the connected experienced qualities.

3.1 The Fundamental To-Be Quality

In order to be applicable to the issues of conscious experience the outside view of spacetime holism must be augmented by an assumption on the nature of consciousness. As suggested in [5], the so-called “hard problem of consciousness”³ can be solved, if we assume a fundamental “to-be quality” of the spacetime whole, which in its elementary form does not involve an “ego-self” and which is not “about something”. The experienced quality may be described as the feeling of being at home and of being one with the universe. From the outside view, tiny fractions of such feelings occur when spacetime structures are distributed or, in other words, when different locations in space or time share the same organization principle. The respective structural notion is *continuity*, as opposed to *discontinuity*.

3.2 Identification

In [1] I argued for a duality between two basic types of conscious experience related to space and time. In compliance with the assumption of the fundamental to-be

³ A formulation of the problem how mind and matter are related suggested by Chalmers [4]

quality, I suggested a correlation between continuity (as seen from an outside observer) and what is experienced as identity by the inside observer.

The first side of the duality, the *spatial self*, depends on borders (discontinuities in space) and determinism (continuity in time). In this state we, as inside observers, are identical through time, as time is the continuous dimension. We lose this experienced quality when our borders are destroyed, or when the subjective causality of the chain of events breaks down (e.g. when we are shocked). The spatial self has a location in space; it makes a distinction between me and the world.

The second side of the duality, the *temporal self* makes a distinction between experiences and therefore between points in time. The temporal self is located in time. By giving up the spatial closure, i.e. by interacting, we get integrated with the world. The experienced quality of this kind of self is the feeling of identity with the world, as in this case space is the continuous dimension.

The two sides of the duality have to be regarded as just two aspects of self experience that never take their extremes, and therefore do not exclude each other. It should be noted that we are far away from being pure inside observers. Identification is therefore never complete, but accompanied by the construction of differences and distances to the entities we identify with. By doing so, we are at least partial outside observers.

As an example for the conflict between spatial and temporal self think of a party and the moment when you look at your watch. It is much later than you thought and you have to make a decision: "Do I stay and keep on enjoying the identification ("the common self") with the nice people around me, or do I leave, because I feel identical with the guy who has to get up in the morning?"

3.3 Asymmetry and Containment

An important structural element of spacetime holism is given by asymmetries of spacetime structures. There should be specific experiential qualities attached to asymmetric structures, if the suggested link between outside and inside views is supposed to work.

As a first approach to asymmetry I would like to introduce the distinction between *action* and *reaction*. In a social interaction game between two people it is often very clear who of them is in control, i.e. who makes the other person react. The acting part has more degrees of freedom, his actions cannot be anticipated, while the actions of the reacting part can be told in advance. We could also call the acting part the *subject* and the reacting part the *object*.

When asking about the experiential aspect of the two roles, there is a clear difference: In the role of the subject – to put it to the extreme - we feel that the other person is part of our belongings or our territory. Identification with the other part reduces to the feelings of caring and protecting. For the object of the social interaction, there is, of course, the possibility of complete refusal of the role and the feeling of being pushed and forced. This would mean "no identification with the other part." The other option is, however, acceptance of the role and a very strong identification which is felt

as a desire to get closer. Typical examples for the directedness of identification which results from this asymmetry are the relation between kids and parents, fans and the star, asymmetric love relations...

Another aspect of asymmetry is *containment*, which addresses the fact that cognitive systems have models of the world they are interacting with. In [6] I suggested to regard the representations a cognitive system has of its environment not as mappings of the environment to cognitive states, but rather as a containment of the interaction game between cognitive system and environment in the cognitive system. Thus we have even a kind of *part-whole containment* which is a logical contradiction for a traditional world view, but an unproblematic special feature of spacetime holism.

The examples so far addressed asymmetries in space. What about asymmetries in time and their experiential aspects? Indeed, the same concepts can be applied to structures in time: We do have much better representations and models of the past⁴ than of the future. By actively recollecting, restructuring and retelling the past, we are subjects relative to "ourselves in the past". Our own future, however, has many degrees of freedom, which makes us the objects of the future. We much more *contain* the past while much less *containing* the future. The experiential aspect of the asymmetry in time is a very different identification with our own past and with our own future. We identify much less with our own past (e.g. with our birth) than with the future (e.g. with our death). In a similar way to identification in space, identification in time has a clear direction, therefore.

3.4 Recursive Memory

Two critical assumptions of spacetime holism are *infinite complexity* and *part-whole containment* (which I already addressed). These assumptions are logical preconditions for the decisive part of the suggested solution, namely *recursive memory*. In a traditional understanding, the memory of an event consists of the representation of the event and the date of the event (e.g. as clock time). Such a construction does not incorporate the time of recollection and consequently does not represent the changes a memory is subjected to whenever it is recollected.⁵ What I am suggesting is that we do not just remember an event, but that we – mostly subconsciously – remember remembering remembering, etc. the event. As a consequence, we create a subjective time distance to the event.

As an extreme example for the role of recursive containment for conscious time experience, I would like to suggest the therapeutic problem of dealing with painful experiences like the death of a loved person, divorce, or other traumata. There surely are very different psychotherapeutic schools disagreeing upon explanatory models and techniques, but one important aspect of the therapeutic process seems to be unquestioned, namely repeated talking about what happened. My interpretation of this

⁴ Although I used the notions of „past“ and „future“ for convenience, there is no presupposition of a flowing time in the argument.

⁵ Assuming the "fading of memories" is certainly not sufficient to explain the complexity of subjective time experiences.

aspect is the following: When we talk about an experience for the second time, we do not just memorize the experience, but also the first talk of the experience; the third talk already contains the memory of two talks in a recursive way. By this, we create a kind of subjective time distance to the experience, which has little to do with clock time. In some cases people have their first talk about a traumatic experience after years or even decades – in such cases it is easily possible to read their lack of emotional distance to the experience from their reactions.

It is tempting to apply the recursive principle also to the projected future: Do we just anticipate a future event or do we also anticipate to anticipate to anticipate... the event? An example with uncomfortable consequences is what might be called “the fear of fearing,” which seems to bring the pain closer to the now instead of creating a safe distance between now and the expected pain, which is exactly the opposite to the role of recursive memory.⁶ A positive example for the same phenomenon is anticipated joy (which, at least in a saying in German language, is the best of all joys).

4 How Time Passes

Fig.1 is an attempt to illustrate a maximum of the involved arguments from a perfect outside view. The conscious observer is regarded as a mixed and therefore incomplete inside-outside observer, who on the one hand insists on the unchanging identity of his self in time, and on the other hand treats the different occurrences of the experience X in the recursive memory structure as one event.

S_n stands for the spacetime structure at clock time n . S_0 is the structure at the time of the experience; it directly contains the experience X (i.e. the experience is the *object* of the structure, while the *self* is the *subject* of the structure). S_3 contains the whole structure of the diagram in a recursive manner. Compared to S_2 , S_3 has a deeper recursive representation of X which means that the subjective distance between the self and the experience is larger than for S_2 . As inside observers, we identify with “ourselves in the past” and with “ourselves in the future.” This means that the *self*-parts of all S_n are experienced as one point: the *now*. As partial outside observers, we construct a space-time block that has only one representation of an experience. This means that all occurrences of the experience X in the different recursive representations collapse to one point: the *event*.

⁶ This reason for this difference should be sought in the “asymmetry of identification”.

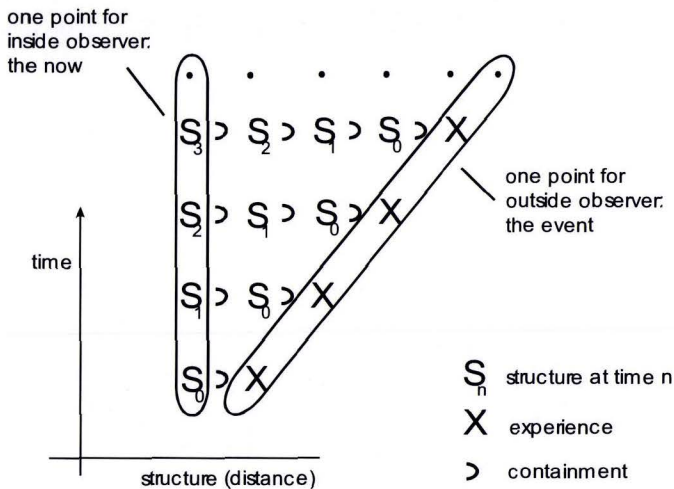


Figure 1: An attempt to illustrate of the recursive structure that explains the passage of time from a perfect outside view. From the inside view of the conscious subject the different representations of the self-part of the structures at different points in clock time collapse to one point: *the now*. From the partial outside view of the conscious observer the different representations of the experience *X* collapse to one point in clock time: *the event*.

Putting this together gives us the strange situation of two fixed points: the *now* and the *event* which, however, appear in different distances to each other. It seems to be our strategy to resolve this situation by inventing some kind of motion.

If we insist on the priority of the inside view, we are inclined to say that “the world states move through our ever constant now.” If we insist on the priority of the (imperfect) outside view, we are inclined to say that “the now moves through the block universe.” The relative motion that is common to both incomplete perspectives has, of course, no logical basis. Only when constructing the suggested perfect outside view, which involves the recursive memory structure and which makes the “fault” produced by the identification of different self-occurrences in time explicit, the contradictions disappear. The fault of identification, though, is exactly what conscious experience is all about.

5 Concluding Remarks

The complexity of both the problem of the passage of time and of the suggested solution is surely big. I do hope, however, that the chosen strategy of developing the approach in this short article has been successful in two ways. On the one hand I tried to underline the experiential aspect of the structural elements of the suggested solution and consequently to give direct meaning to the respective concepts. On the other hand I tried

to give a positive example for “holistic reasoning” by showing that working with concepts that - in the final analysis - cannot be clearly defined does not necessarily lead to complete arbitrariness, and that they can support a fruitful exchange between different disciplines.

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