Research Article

Negation of the Separatedness-Based Framework as a Methodological Principle

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It is shown how a negation of the assumption that the physical phenomena are representable accurately by separate mathematical points offers a reliable method, which allows to: predict correctly certain empirical findings, anticipate and indicate a source of specific shortcomings or difficulties faced by different models and theories, give an alternative interpretation and possibly an independent justification to various concepts considered currently in the literature in relation to actual observations or thought experiments.

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1. Introduction

Current models of different physical phenomena typically represent their objects of interest (e.g., systems, states, events, or other entities) by what we could refer to (as in [1], [2]) as separate mathematical points, usually organized into an abstract space of some sort. For instance, the state of a system in classical mechanics represented as a real-valued point in the phase space of a given theory, the state of a system in quantum mechanics as a complex-valued vector in a Hilbert space, or spacetime as a manifold with various functions defined at each of its points [3], [4]. In such an approach, the objects, or values of physical quantities, as represented by the points, can be either two (or more) points distinct from each other (regardless of some possible overlap between the actual contents, e.g., states, that each of the points stands for) or, alternatively, one and the very same point. Such points are typically considered zero-dimensional objects, thus having no size (or shape), and described using real numbers, with infinite numbers of digits, which implies an infinite precision of their determination (which is common both for spaces considered continuous as well as discrete, that is, ones with discretely-spaced points).

The notion of infinity, as it appears in physical theories, has long been considered conceptually suspect, and it is rather doubtful whether infinities actually exist (in some sense) or can be an accurate description of any physical phenomena [5]. They could suggest, in particular, the possibility of infinite information contained in a finite volume of (physical) space. Regarding the points, as described by the infinite-precision numbers, since they are considered themselves to have no size, one could argue that it is not sensible, to begin with, to posit that any concrete physical 'thing' could actually be composed of elements each having literally no size. As an alternative to such infinitely-precisely determinable entities, suggested as a possible remedy for such conceptual difficulties on the fundamental level of numbers used to describe the physical phenomena, introduced recently was a notion of finite-information quantities, with each such quantity to be considered as having a discrete (i.e., 'thick', 'extended') interval of values associated with it [6]. Since this implies an inherent indeterminacy of such a single quantity's actual value (but also due to its other characteristics), it may turn out to be a more natural notion for the description of quantum mechanical systems [7] but compatible with and applicable also in classical physics [8].

In previous work [1], [2] we argued, however, that the 'problem of points' will also pertain to such discrete intervals (as well as to other related notions that could be derived from or based on it; which, on such view, would thus all count as 'points'). For if such an interval is taken to constitute a set of values as located between its two respective end-points (e.g., an interval of numerical length 1, centered at 1 and spanned on the real line between 0.5 and 1.5), essentially the same argument will apply to those end-points (or actually to any one of all the points that the interval supposedly encompasses). It was then suggested that what we should consider problematic is thus the general notion assuming the separate points, regardless of their (relative) 'size', called therein a separate[d]ness-based framework (SF), and that the construction of an alternative mathematical notion is desirable and might be possible. Here, we will primarily show how a negation of the SF might actually provide a reliable methodological tool, enabling the correct assessment of certain aspects of different models of physical phenomena and the prediction of certain empirical observations. From now on, to avoid confusion with what is usually considered a–specifically geometric–"point" [9], instead of the 'separate point(s)'–understood in this broad sense as specified above–we will use a more generic term, that is: (singular) *separatum* or (plural) *separata*. Let us summarize its meaning in the following definition:

Definition 1 (Separatum). *Any abstract object that can be considered separate from others.*

The present paper is organized as follows: In Section 2, we state succinctly our main thesis, 3, describe two general types of consequences to which it leads, 4, propose that they might constitute a methodological principle, a ’method’ that can be used when approaching or formulating different putative models of physical phenomena, 5, show that the proposed method might actually work, 5.1, primarily by giving some concrete empirical examples where it allows us to formulate predictions (or, actually, post-dictions) arguably in agreement with what has actually been observed, 5.2, then also by indirectly demonstrating its potential usefulness, namely showing how it might naturally lead to certain concepts (more or less well-developed) that are actually considered in the literature, in different contexts, in particular as potential explanations of various actual results or thought experiments, thus giving an alternative interpretation and possibly an independent justification to some of such concepts, while indicating certain theoretical difficulties the appearance of which our method would suggest to expect, 6, consider exactly what might be the nature and properties, and how they could be inferred, of the alternative mathematical notion that is suggested by our main thesis, and 7, give some final remarks and conclude the work.

2. The postulate

Consider a single postulate: The physical phenomena are not representable accurately by the notion of separata.

3. The consequences

What does this postulate entail? We posit that–since the physical phenomena do tend to be represented by the notion of separata–it implies that two general types of situations will occur (which can be further subdivided into more fine-grained categories, but the argument will remain essentially the same), namely, whenever some physical phenomenon is taken (i.e., assumed, hypothesized, modeled, theorized, etc) to be:

1. (a) One and the same object or ’thing’ (in the broad sense of the term), or (b) described by a quantity having one specific value (being, in itself or perhaps in different circumstances, the same, or constant)–it should eventually turn out that it is in fact not really so.
2. (a) Two (or more) objects or ’things’ being strictly distinct from each other, or (b) described by a quantity taking two strictly distinct values (perhaps in different situations)–it should, similarly, eventually turn out that it is in fact not really so.

4. The method

We propose that these two general points can be viewed as constituting a methodological principle, a method to be applied when approaching different models or theories aimed at describing some physical phenomena. What it would say is the following: Whenever one finds in a model of some sort a commitment to an assumption of the type as made in (1) or (2) above, one can expect that it does not hold strictly and so there must be some way, for which one should therefore look, in which the corresponding phenomena are different than what is being expected in the given model, not satisfying the criteria of the initial assumption[1].

5. The application of the method

5.1. Empirical examples

We will now give some concrete examples, related to actual empirical findings (some of which have been historically considered as rather unexpected), that can be seen as falling into one of the two categories. The assertions that had been made in different models are, for instance, the following:

- (1a) Atoms, or sub-atomic particles, are each a simple individual entity. Elementary particles, e.g., electrons, are entities localized in space, each carrying its very own 'portion' of energy.
- (1b) Properties of physical systems, e.g., position or momentum of a particle, can be described before their measurement by quantities each taking a single definite value. Observation of physical quantities made in a different order, e.g., $x \to p$ vs $p \to x$, gives the same value as a result. Probability of observing objects tunnelling through a potential barrier has a specific value equal to 0. Scalar quantity representing the spacetime curvature has a fixed value equal to 0. Scale factor representing the relative size of the physical space has a fixed value. Duration of an interval of time between two events has the same value for observers in relative motion.
- (2a) Objects, e.g., photons, located at spacelike separated regions of spacetime must be distinct independent systems. Light beam is a wave of energy spread out over distinct points of space.
- (2b) Quantities representing certain properties, e.g., energy of electrons bound in atoms, of systems considered arbitrarily similar (in relevant respects) to each other will be described by distinguishable distinct values. Speed of light is a quantity that takes distinct values according to observers in relative motion.

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In each of these cases, it has eventually turned out, as could have been expected according to our method, that, in fact, it is not really so [10][11][12][13][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30][31][32][33].

Now, based on these examples, we will clarify certain aspects of the proposed method, especially related to the question of exactly what sort of conclusions can be drawn when using it, addressing some possible objections to its validity and applicability:

- One could surely give an abundance of putative counterexamples and use them as evidence that our method, in fact, does not work. We would respond to this with a prediction saying that the method will work in all conceivable situations and a suggestion that cases where it seems like it fails (i.e., has not yet worked) are due to (a) a limited precision of measurement [6][8] and/or (b) a lack of relevant empirical observations or a misinterpretation of the existing ones (resulting from ’seeing’ still some separata, perhaps by disregarding what is considered a broader context or irrelevant details–taking Wigner’s friend as being separate from Wigner, so to speak)[2] [2].
- One might wonder how the ’generic’ predictions in such examples, as generated by our method (through an essentially ’*a priori*’ reasoning), relate to the established specific causes and explanations of the corresponding phenomena. For instance, the duration of time intervals between two events being not equal for different observers can be explained technically as a consequence of the invariance of the laws of physics and constancy of the speed of light as assessed in different reference frames in motion relative to each other [4]. We would respond to this that (a) the specific phenomena, accompanied by the occurrence of different values of physical quantities (e.g., representing what is considered the duration of some time interval), are governed by specific laws and so will always have some specific particular explanation but (b) those explanations will eventually always effectively agree with the general, generic prediction as dictated by an application of our method[3].
- Can the initial assertions (i.e., the ones to be eventually negated, according to our method) as made in examples from the two categories, (1) and (2) respectively, be seen as exact opposites of each other, at least when there seem to be ’counterparts’ in both categories referring apparently to the same physical phenomenon? And does an application of the rule to one of such counterparts, from one of the two categories, (1) or (2), negating its respective assumption, lead to the conclusion that one must accept instead the ’corresponding’ assertion from the other, ’opposite’ category, that is, (2) or (1), respectively? In other words, is being two (or more) distinct separata the necessary consequence of not being one and the same separatum (and vice versa)? For instance, taking the example of what we consider ”light”, when it turns out that it is not really distributed wave-like, does it mean then that it must be a

localized particle? And, perhaps in other circumstances, when it turns out that it is not really localized particle-like, does it mean then that it must be a distributed wave? [3] Regarding this point, we conclude that, on our view, the answer is in the negative. In this sense, ”light” is thus (in any circumstances) neither a localized particle nor a distributed wave. The reason for this, based on our main postulate, is simply that the assumptions, as made in each category, are something that can only be negated, and we consider both categories to be aspects of what we call SF. For this reason also, we cannot speak of strict ’counterparts’ or correspondences between the phenomena as described putatively by the examples in the two categories (as they do not provide any ’link’, do not ’redirect’, between each other), but at most, in a certain sense, only apparent–or ’approximate’–ones. However, specifically to the question of what can be said about the physical phenomena in some positive terms, accepting our postulate, besides such a negation, we will return in the last Section 6.

- In connection with the above point, for some particular examples of type (1) or (2), for which anything that could be seen as an analogue–a ’counterpart’–that would qualify for the ’opposite’ category, (2) or (1) respectively, has not arguably thus far been (directly or indirectly) observed, could we predict that it eventually, at least in principle, should? For instance, as an apparent counterpart for the example in which the scalar quantity representing a measure of the spacetime curvature has turned out to not really be described by a specific fixed value we could conceive of a situation, say, of some putative spacetime regions being arbitrarily similar to each other (in relevant respects) for which we would then assume that the given quantity (i.e., corresponding to the one appearing in the other counterpart situation) will be properly described by distinguishable distinct values, and by using our method conclude that it should turn out that it is, in fact, not really so. To the extent that such apparently corresponding phenomena can be expected to be observed at all, our method suggests that one can indeed expect that.

5.2. Conceptual examples

In this section, we consider some other examples of the possible application of our method, involving different types of (more or less abstract) objects or variables. Let us start with a (lengthy) list, formulating explicitly (in a rather random order) some assertions (of type (1) or (2) or composite and in particular mixed ones, which our method does also admit, and now we do not care anymore about their respective sub-categories), in their content arguably at least in some way resembling some of the assumptions as made, in different physical contexts, by various actual models or theories (with some of them related, or dependent, while others to be seen perhaps as directly competing against each other):

a. Moment of time is described by a parameter t having a specific value.
b. There are many distinct moments of time, described by the parameter t taking distinct values (e.g., t_{-1}, t_0, t_1).
c. Any moment of time is a set of distinct events said to occur at this moment.
d. Any moment of time is a specific event said to occur at this moment.
e. Events that occur are described by different quantities, each having a specific value.
f. Set of events constituting a moment of time is the same according to observers in relative motion.
g. Order in which any two spacelike separated events occur is the same according to observers in relative motion.
h. Spacetime is an object composed of distinct events which are said to exist in this object.
i. Regardless of how it is assessed, each event in spacetime is described by a specific set of quantities, each having a specific value.
j. Future is a specific object being a set of moments of time.
k. Past is a specific object being a set of moments of time.
l. Physical systems located in space at a given moment of time are distinct entities.
m. Causal order of events is described before its measurement by a variable denoting different possible such orders having a specific value.
n. Measurement of physical quantities occurs at a single moment of time (described by the parameter t having a specific value).
o. The process of measurement of physical quantities occurs over many distinct moments of time (with the corresponding parameter t taking distinct values).
p. Measurement outcome is a value selected from a specific set of distinct possible results.
q. Any two observed events (i.e., outcomes of measurements) occur within one and the same object called spacetime.
r. Different observed events (e.g., observed by different observers) occur in distinct objects called spacetimes.
s. Observer system (i.e., a measuring apparatus) and systems observed (including such being themselves observers of yet another systems thus observed) are distinct entities.
t. The quantity representing the number of spacetime dimensions is described by a specific value.

u. Physical interaction entails two (or more) distinct systems (between which the ”action” occurs).

v. Physical interaction is a single entity (e.g., one event, or one process).

Now, we apply our method to these points, in the usual way, that is, by saying that in each case it should turn out that the actual phenomena being thus described are not really so (and for some of them it seems like it indeed already did, but we leave it to the reader to guess which ones, as our goals in this section are somewhat different than in the preceding one). Then, what we would like to do here is to suggest that selecting some of the specific points from the above pool, taken in a ’negated’ form as resulting from the application of the method, possibly in some combinations, might lead one straight to certain general concepts closely resembling some actually considered in the literature (in particular as potential solutions to different problems related with actual observations or thought experiments). In each case, however, this similarity, or overlap, can be at most a partial one, primarily because some of those concepts (or more basic notions on which they are based) do not have a one established definition which one could strive to satisfy strictly in the first place, and being limited precisely by the extent to which they can be taken in a correspondingly ’negative’ form. Nonetheless, below we will discuss some of such concepts, for each of them (I) indicating some (combinations) of the above-listed points from which it could be derived, (II) describing it briefly as it appears in the literature, focusing on specific problems to which it is related (and, if it will seem necessary, giving some additional justification for its very appearance on this list), and (III) specifying the difficulties which might arise for models or theories in which it appears in some form, resulting from retaining some ’traces’ of SF (in particular in the specific shape of some of the other assumptions from the list above, taken in their initial, non-negated form):

- *Non-absoluteness of simultaneity* (I) (f). (II) While a basic conclusion of the relativity theory posits that simultaneity is relative, rather than ’absolute’ [4], we suggest to consider it limited to a purely ’negative’ concept, that is, expressing a thesis saying that there is in fact no absolute simultaneity and, moreover, one should not speak of any simultaneity (absolute, relative, or otherwise) in the first place, construed as a moment of time being a set of distinct events, as this would clearly amount to (III) our very assumption (c), constituting thus a trace of SF, which in turn might lead, after some possible reasoning [34], to a view called ”block universe” (a conclusion which perhaps could be avoided by taking (d) instead of (c), however itself a move with rather questionable benefits), which could also be recognized on our list as the assumption (h) and which, in conjunction with some further assumptions like (i), seems especially problematic, likely to pose difficulties for reconciliation of the concept considered here with certain others, like some of the ones discussed below.

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- *Open future* (I) Perhaps (i), or (j) with (e). (II) Concept inspired in particular by quantum theory, according to which the outcomes of measurements yet to be performed of–at least some–physical systems' properties are not described by a one specific value [3][35], which suggests that, therefore, such future events, relative to the time of measurement, are not pre-determined and so the future is in this sense not 'fixed' (or 'closed') [36][37], which (III) if taken within SF, could pose a problem for reconciliation (or actually appears to be in a direct conflict)–due in particular to the very main assumption that is to be negated here–with the "block universe" view as resulting supposedly from the notion of relativity of simultaneity (as described above), and besides that, should be expected to entail conceptual difficulties such as the questions, e.g., whether it suffices that a single future event is not determined for the (whole) future being in itself not determined, or whether there can be any future events which would be in fact determined (as could be suggested by the probability of their occurrence being described by a specific value equal to 1), which could be seen as direct manifestations or consequences of some of our other assumptions having been made (like (c) and (l), (p), usually (a) and (b), but also (n) or (o)).
- *Retrocausality* (I) Identifying "causality" with an actual physical 'influence' or interaction of some sort, it could be (a) and (b), or (m), supplemented perhaps by (u) and/or (v). (II) Posits that the possible influence of events as exerted on other events is not limited to ones located in what is considered their respective future (or present), with such influences traveling also in some way backward in time, which could happen locally (being an 'action-by-contact', or 'continuous action'; and which could potentially provide a 'local' explanation for the correlations as observed between spacelike separated events, through some mechanism involving such interactions "zigzagging" through spacetime) or non-locally, a concept which might pertain also, in particular, to action-based approaches where under such an interpretation a final state could somehow directly (i.e., physically) influence the preceding course of events [38], but (III) if considered in terms as allowed within the SF, it faces some rather obvious, and serious, conceptual problems.
- *Open past* (I) Perhaps (i), or (e) with (k). (II) Motivated by different lines of argumentation, for instance, by conjunction of some form of *Open future* combined with assumptions about the time-symmetry of relevant laws of physics; seen as a consequence of some form of *Retrocausality*; or derived from considerations about storage and retention of information, modeled, e.g., as a process in which past events, whose relation to present ones becomes indeterminate, would in some sense 'cease to be' [39][40], but (III) to the extent that past is often treated, in particular, as analogous (or 'symmetric') to

future, this concept can be expected to be plagued by correspondingly analogous or 'symmetric' traces of SF to concepts which pertain to some notion of 'future'.

- *Non-absoluteness of observed events* (I) Perhaps (q), maybe with (t). (II) As entertained in the literature it stems in particular from considerations of the "Wigner's friend" type of scenarios, in which the accounts of an actual state of what is considered the same physical system as given by different agents–with both of them following the prescriptions of quantum mechanics–can be effectively inconsistent with each other [41][42], and suggests that in order to prevent such conflicts one could posit that the observed events (i.e., outcomes of measurements as performed by an individual 'apparatus') are in some sense not–or at least not fully–'public' (or 'exposed') to other potential observers of a given system, but rather somehow 'private', specifically, for instance, relational, or perspectival [36][43][44][45][46][47], a view which (III) if 'contaminated' with traces of SF, like (s), (e), or (r), might lead in particular to theoretical difficulties with establishing 'links' allowing to find correspondences (or 'maps') between different such perspectives, the lack of which could imply a total subjectivity (and therefore 'solipsism') of the accounts of (any) observed physical phenomena.

The reader will certainly be able to supplement the lists in this and the preceding section with yet another, numerous examples of choice. As some additional illustration, giving a flavor of the sort of conceptual problems or difficulties as faced by different models or theories that could be expected based on our perspective (and which, most likely, can be resolved within the SF, leading however to another such a problems down the road), in particular such giving empirically clearly inadequate predictions, one could mention, for instance: The problem of electron "self-repulsion", with the electron modeled as a 'cloud' of charge distributed at distinct points in space, with its different parts consequently repelling one another in such a model; or problems with establishing theoretically an actual number of particles when they are considered as localized entities [48].

6. The alternative

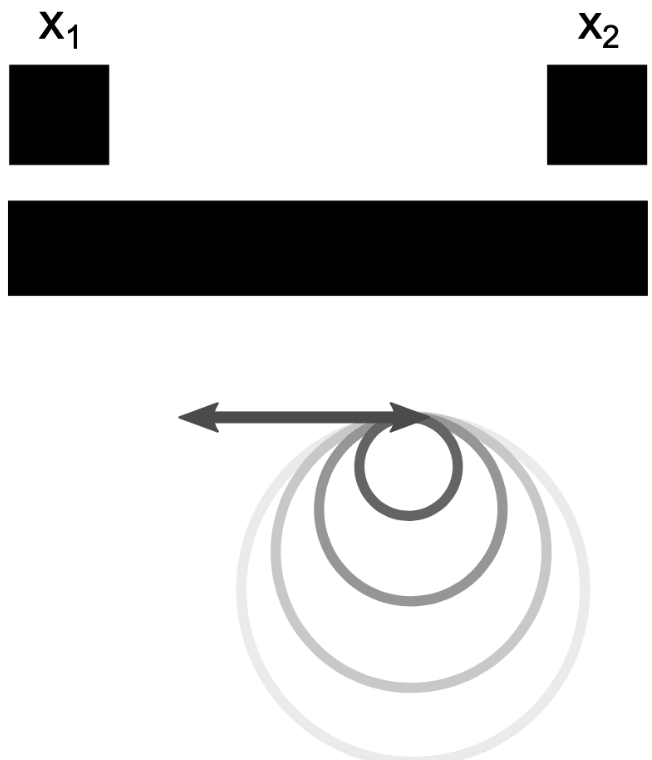

Figure 1. Separata vs a tentative alternative

The examples provided above should have demonstrated by now, directly or indirectly, that the proposed method might actually work, thus lending support to our main proposition from which it derives (Section 2). However, since it allows only negative determinations (a property of a system being described by neither one specific value nor many distinct values, an electron being neither a particle nor wave, etc), saying how things are not, one wonders what they might actually be, and what might be the alternative to the descriptions as allowed within the SF, based on separata. To address this question, perhaps we would need first to supplement our main postulate with one basic–and admittedly rather vague–assumption, namely, saying something along the lines of: The physical phenomena seem to happen in some very concrete way, such that they can be to some extent effectively approximated with descriptions based on the notion of separata. We should therefore look for some general notion to which the SF with its separata would be some sort of 'approximation' (Fig. 1). To anticipate the conclusions here, the result of our analysis is that what we can quite confidently say for now is not much more than that the sought-

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after notion is something that is a ’non’-SF. We can, nevertheless, think of at least two (but not necessarily independent) tentative options, or routes, by which we could potentially arrive at some definite mathematical notion and perhaps actually construct (an example of) the non-SF, which we might call, respectively:

- *Graded* This option would suggest adopting (and most likely somehow adapting) a sort of ’graded’ language and notions. Namely, while finding, in reference to some phenomena, an assumption being made of one of our two types, that is, either that they are like one and the same separatum or that they are like two (or more) distinct separata, we must conclude in any such case that in fact the given phenomena are not really so, one could say instead that they are so, in a certain sense, to some ’degree’, ’a little bit’. In what sense exactly? A similar language, and possibly also a desired sense, appears in particular in the interpretation of probabilities, as appearing in models of physical phenomena, as propensities (understood as a sort of graded causal influences), described also as potentialities, or tendencies (of certain events, or outcomes of measurement, to obtain), with the related phenomena being described in certain contexts as ’unsharp’, and modeled using fuzzy notions [6][49]. While this might seem like leading in at least one of the possible directions we are perhaps looking for (describing in some constructive way the phenomena which would be neither exactly the same nor not the same), we note that the ’strength’ (or ’weakness’) of such putative ’tendencies’ is typically described itself by using what can be considered separata (retaining thus traces of SF), which might be particularly misleading.
- *Change* This option derives from the view that while what is commonly understood by ”change” might be modeled, within the SF, as involving some distinct separata and a singular process of their juxtaposition, with such a connection (of, on the one hand, the difference between the separata being distinct, and on the other, their bringing together) resulting in a sort of ’contrast’ (or ’tension’) [50][51], it would be more adequately described by taking this process as being something that is not entirely different from the separata themselves. What it therefore suggests is to consider an ’actual’ change, in which there would be no singular process and no distinct separata, but only some form of a ’contrast’, or ’tension’, alone. How could one conceptualize this more precisely? It so happens that what is referred to as ”change” in physics is often posited to be closely related, or sometimes even identified, with the notion called ”time”. Then, especially to the extent that the understanding of time will depend on particular mathematical language and notions as employed by physics [52], we surmise that perhaps an inspiration for advancements along this route might be found in some of the conceptions

about time, but also the other way round, namely that potential developments of this option (but most likely in some conjunction with the above one) should contribute to some clarification of the various problems related to the (many) phenomena that go under the name of ”time” [53][54][55][56][57][58][59], addressing in particular the opinions saying that the actual phenomenon of (’flowing’) time, being arguably in some sense inherently complex (”rich”), is–at least currently–beyond the conceptual scope and reach of physics [60].

Taken together, it might intuitively seem that such two routes, or their combination (or rather a fusion), would lead to a notion expressing a sort of inherent ’indefiniteness’ (and perhaps ’messiness’), but also, in a sense (and maybe somewhat paradoxically), a stronger ’continuity’ and more ’controllable’ influences within the physical phenomena (as opposed, e.g., to a picture of ’discontinuity’, emerging supposedly as a consequence of what the quantum theory suggests, with its discrete ”jumps” and ”randomness” [3][61]), but exactly how best to approach it we leave it here as an open problem.

Finally, let us mention that some of such possible options or avenues, in particular *Change* but perhaps also the *Graded* one, as was argued also in [1][2], might actually be suggested, or inspired, by an analysis of what one might call our ’direct’ experience of the world. Although it is indeed unclear how or exactly what it is that we directly experience (as evidenced in particular by findings and their interpretations suggesting that many, if not most, of our innocent conceptions about it–which one could consider self-evident and uncontroversial–might actually turn out to be ’illusions’ of some sort) [62][63][64][65], or how best to describe it mathematically, the approach of a disregard for the potential suggestions that it could offer, in the context of interest to us here, would be rather ill-advised (since after all, obviously, we arrive at, and verify, any theoretical hypotheses in physics through the empirical observations which we obtain inevitably, at least ’filtered’, through our ’phenomenal’ experience) [66]. Therefore, the postulated non-SF should perhaps allow also to describe, or at least should not be in conflict with, such direct experience (whatever it is) in itself, and as a step in such direction let us describe now a one last application of our method, leading arguably to conclusions agreeing with our intuition, this time in two examples concerning our perception of things in what is typically considered, respectively, physical:

- ”space”. When I look at, say, the moon, if one assumed that the moon and my percept of the moon are two distinct ’things’, i.e., on the one hand the moon as a lump of light-reflecting rocks being ’out there’ in the sky and on the other my percept of this moon as, say, a wave of ions flowing ’here’ in my head, we must conclude as per our method that the actual phenomena under consideration are not really so.

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If one assumed instead that the moon and my percept of the moon are a one ’thing’ (which would be either strictly out there in the sky as the moon or here in my head as the ion wave), we would similarly conclude that they are not really so. What, however, one can do is to go one of our suggested routes, and for instance use the language of the *Graded* option and say, in each case, that the phenomena are ’a little bit’ so (i.e., one and the same thing or two distinct things), and so my percept of the moon is a little bit here in my head and a little bit (and so quite literally) out there in the sky as the said lump of rocks itself. And this could be the underlying reason for (or at least contribute to, somehow, but perhaps even more so when combined somehow with suggestions of the *Change* option) a direct experience of the ’extension’ of–i.e., the ’distance’ between objects in–what we usually consider ”space”.

- ”time”. When I experience what I consider a memory of some event, say, my visit to a dentist last month, if one assumed that the visit being remembered and my experience of remembering the visit are two distinct ’things’, i.e., on the one hand the visit as an event happening ’in the past’ in the dentist room and on the other my recollection of this visit as (say) a wave of ions flowing ’now’ in my head, we must obviously conclude that the actual phenomena under consideration are not really so. If one assumed instead that the visit and my recollection of it are a one ’thing’ (which would be either strictly in the past as the event of me sitting in the dentist room or now as the ion wave), we would again conclude that they are not really so. One can, however, use a strategy like in the example above and using the ’graded’ language say that my experience of remembering the visit is a little bit now in my head and a little bit in the past at the actual visit in the dentist room (and so it means that in this sense my experience, quite literally, moves back in time). And this could be the reason (similarly as in the example above) for a direct experience of the ’extension’ of–i.e., the ’distance’ between the events in–what we usually consider ”time”.

7. Conclusion

We proposed here a methodological principle that can be applied automatically (’mindlessly’) in different situations and, we posit, should always lead to correct results. And if it indeed does, then, let us note as one final remark before closing, it might pose a curious challenge for the view on mathematics known as constructivism (and in particular intuitionism), which posits that only such mathematical objects that can in principle be (or actually were) in some way explicitly constructed can be said to exist [67]. For we could claim that (a) (based on its effectiveness) the mathematical object we call the ”non-SF” must in some (a rather concrete) sense 'exist', but (b) (due to the nature of what is being demanded from it, and despite our tentative attempt at devising some possible routes towards it) it simply cannot be in any meaningful way explicitly constructed. And this situation, in which something does (in some sense) exist but cannot be explicitly constructed, taken literally, would seem to constitute a counterexample against such view[4].

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Author Contributions

B.J. was the sole author and is responsible for all aspects of the manuscript.

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Footnotes

[1] Which, assuming (ideally) a continued progress of empirical research, should eventually, sooner or later, manifest itself in some actual observations.

[2] To put it plainly, whenever one wants to find in the actual phenomena some separata, he will always succeed in making himself believe that he does indeed see some.

[3] On a side note, one of predictions of the method must be that the constancy of the speed of light, just as any other such strict ’constancy’, can only be apparent (that is, ’approximate’; somewhat reminding thus what is hypothesized in different variable-constants theories).

[4] One objection one could raise against this argument is that the non-SF is to be seen as a primitive object, rather than a statement a proof of which one could try to *construct*, in the first place. The argument, however, rests rather on a conclusion that what the idea of non-SF entails (while concurring with the negation of the law of excluded middle) is that the very categories of basic ’primitive’ objects, or structures with definite properties, and therefore *construction* of such as well, seem to lose their distinctive meaning. Alternatively, one could perhaps make a case that, rather than a counterexample against constructivism, our conclusion would be better seen as a claim about an ’incompleteness’ (i.e., of current mathematical languages when it comes to expressing and formulating precisely the postulated non-SF and so describing accurately the physical phenomena; in this context see also [53][60]).

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