



Free will in the clustered-minds multiverse, and some comments on S. Sarasvathy's 'choice matters'

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Abstract

This paper sketches a new version of the multiverse interpretation of quantum mechanics, the clustered-minds multiverse, that has been presented in detail elsewhere (Schade 2018, Springer, New York). It briefly shows why it grants us with free will and reflects upon the (im-)possibility of singular-universe explanations of free will (e.g., Laskey 2018, *J Cogn Sci* 19–2:125–163). It also critically comments upon S. Sarasvathy's 'choice matters,' one of the other contributions to this mini symposium.

Keywords Free will · Quantum mechanics · Clustered-minds multiverse · Many-worlds interpretation · Many-minds interpretation

1 Introduction

When Shabnam Mousavi, Shyam Sunder, and I decided to organize the Humboldt-Kreis, I strongly believed in the multiverse interpretation of quantum mechanics (Everett 1957).¹ This interpretation is more convincing to me from both a physical as well as a philosophy of science perspective than other interpretations. It might also be more fruitful for understanding how decisions are made, and that they are made at all, appreciating free will and its critical role in social science. At the end of the Kreis, I continued to hold these convictions. Does this mean that nothing happened during these three days?

¹ This interpretation is often called the 'many-worlds' interpretation, but I find this term misleading. The reason is that there is only one world, but with different versions of observers being attached to (entangled with) different subjective realities. Many-minds interpretation, used by some authors, is a more appropriate term for how I see the quantum world. More precise, as a description of my own approach, is the term clustered-minds multiverse, to be introduced below.

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On the contrary, so much happened. First, I learned about linkages between physics and decisions I was not aware of, and more about effectuation (Sarasvathy 2001) than I knew before the Kreis. Secondly, I benefitted from comments and suggestions from the participants on my *clustered-minds-multiverse* (CMM) concept (monograph: Schade 2018; see also below).

I also learned a lot in the aftermath, e.g., from discussions with Kathryn Laskey (GMU), a proponent of a quantum-based, singular-universe theory of free will (Laskey 2018), who was introduced to me by one of the participants in the Kreis, Laura Martignon. I also read the contributions submitted by the participants with a lot of interest. Sarasvathy, e.g., who, after intensively studying my monograph (Schade 2018) over the summer 2019 and participating in the multiverse presentations by Guido Bacciagaluppi and myself during the workshop, decided to write a piece on the multiverse (and not on effectuation, the topic of her presentation at the Kreis). Two questions that the reader of this mini-symposium might have are: (a) why not just use a singular-universe version of free will, based on quantum mechanics, why do we need the multiverse for justifying free will?, and (b) how does Sarasvathy's contribution – replacing large part of physical by social-science based reasoning – relate to the other contributions on the multiverse? Therefore I decided to, besides explaining my version of the multiverse interpretation of quantum mechanics and why I think it is necessary for justifying free will, to briefly touch upon the topic of singular-universe free will à la Laskey and to spend even more ink on Sarasvathy's 'choice matters' concept. The discussion of Sarasvathy's concept will also turn out to be helpful in demonstrating some of the specifics of my CMM concept.

2 Multiverse interpretation and free will

Many contemporary philosophers regard free will, and even consciousness, to be an illusion (e.g., Dennett 1991). The question as to whether and in what form free will exists finally can be addressed from the perspective of physics/philosophy of science. Doing so, I am convinced, requires dealing with the interpretation problem of quantum mechanics. In any case, within Newtonian physics there is no room for free will in the strict sense of being able to *choose otherwise*. Surprisingly, however, compatibilist philosophers do not believe that the Newtonian determinism might be at odds with free will (e.g., Frankfurt 1969), but I do not perceive their reasoning as convincing, as it is too much driven by the needs of jurisprudence to justify responsibility for unlawful actions (Schade 2018, chaps. 6 and 7).

Many changes in the *weltanschauung* are already realized within the standard, singular-universe interpretation of quantum mechanics (collapse theory/reduction postulate). And some researchers indeed use *this* interpretation as a basis of free will (e.g., Kane 1985; Stapp 2017; Laskey 2018). Of the singular-universe approaches, I regard Laskey's (2018), built on Stapp (who points for inspiration to von Neumann),

to be the most creative and advanced. According to this theory, free will is related to the *choice of what to measure* and to the *quantum Zeno effect* (Misra and Sudarshan 1977).

The anti-free will evidence presented by Libet and coauthors (e.g., Libet et al. 1982) as well as his neuroscience followers (e.g., Soon et al., 2008) is my main reason for suggesting a novel, multiverse-based alternative to the various collapse/singular-universe versions of free will. The famous Libet et al. experiments and more sophisticated and methodologically advanced follow-up neuroscience experiments (e.g., Soon et al. 2008) showed that consciousness seems to run after the fact—a major obstacle to free will. For example, in the first experiments, the readiness potential for a motor action builds up earlier than the self-reported conscious decision making. And thus, as many argue, consciousness cannot possibly be responsible for any decisions. The bold inference from this data—that free will is an illusion—is not valid in the multiverse (as I argue in my book and briefly dealt with in my presentation). The singular-universe quantum theories, with their implied *irreversibility* of actions, cannot rule out the inference that free will is a mere illusion.² Some see this irreversibility itself as an *advantage* of collapse theories for other reasons, namely, *creation of an arrow of time* (the so-called quantum–mechanical arrow of time; Zeh 1999). But ruling out no-free will inference from the Libet et al. data, one needs *parallel times*, or times as special cases of parallel universes (see the discussion in chap. 3 of Schade 2018 and Deutsch 1997). The basis for this, in turn, is provided within the Wheeler/DeWitt equation (DeWitt 1967) linking general relativity and the Schrödinger equation, where time as a variable *disappears*. In the same way in which the—unaltered and unaccompanied—Schrödinger equation is a multiverse equation, the Wheeler/ DeWitt equation also is. Thus, it is the multiverse perspective that rules out the Libet evidence against free will.

There is, in any case, far greater *space* (or degrees of freedom, for that matter) for free will within the multiverse interpretation of quantum mechanics than in any singular universe interpretation. This, however, requires interpreting the multiverse in a certain way,³ so that the so-called ‘*mindless-hulk*’ problem (Barrett 1999; see also the discussion of Sarasvathy’s approach below) can be avoided; it is also required to develop an *idealist* version of the multiverse (see Schade 2018, chap. 4). Generally, the multiverse interpretation is gaining popularity or even achieving dominance in some domains of physics (especially in quantum computing), but it does not yet elsewhere, certainly not in experimental quantum mechanics and in practical applications with ‘shut-up-and-calculate’ mentality. Note that the multiverse interpretation is often, more neutrally, called the ‘theory of the universal wave function,’ because it solely relies on the Schrödinger equation (1926) with its puzzling concept

² The physical theory that has been put forward to present an invalidation of the Libet evidence within singular universe quantum mechanics by some authors is not convincing to me, but the room is not sufficient, here, for an appropriate discussion (Hameroff 2012).

³ That the multiverse interpretation needs interpretation has convincingly been argued by Albrecht and Loewer (1988).

of the coexistence of states, so-called *superpositions*, famously illustrated in the well-known Schrödinger's cat thought experiment.

In my recent monograph, I have proposed a new concept of free will (Schade 2018), *vectorial choice*, based on a novel version of the quantum-multiverse interpretation, the CMM, that fulfills the above-specified requirements. Vectorial choices put different conscious emphasis on the different realities that co-exist in parallel—under several important restrictions, however. Since, as already argued, the multiverse interpretation is also the most parsimonious interpretation of quantum mechanics in terms of required theory (no ‘artificial’ add-ons beyond the Schrödinger equation such as wave function collapse are needed),⁴ given the interdisciplinary evidence for the multiverse (Schade 2015; 2018, chap. 3), and since the earlier claims of apparent ontological and logical problems with respect to this interpretation have been addressed, I argue for this new position on free will as an important alternative to the existing ones. I also examine consequences for decision making more generally, and for the social sciences (e.g., game theory, and self-fulfilling prophecies).

How does the CMM address the mindless-hulk problem (Barrett 1999), and why is it an idealist version of the multiverse? The multiverse only ‘makes sense,’ ontologically, if situations can be avoided where individuals are frequently (or always) surrounded by zombies. In the idealist framework of the CMM, consciousness is able to allocate more or less weight to different realities, thus, consciousness is ‘active.’ My position stays away from the extremes that have been proposed by other authors, e.g., a *passive* coupling of consciousness with all existing realities, proposed by the Oxford school with *no free will at all* (see the contribution to this mini symposium by Guido Bacciagaluppi, that deals with this approach) – indicating a strict form of psychophysical parallelism. Or at the other extreme, the selection of just one reality by consciousness (e.g., Squires 1991), leading to *unrestricted free will*, but also into a world of zombies (see Schade 2018, chaps. 4 and 6). The concept that the CMM proposes is consistent with *weak psychophysical parallelism*, where consciousness is indeed required to stay with all realities within the decohering histories, but where the emphasis put on them differs. According to one of the restrictions put forward in the CMM, larger parts of consciousness are not allowed to be allocated to realities where hardly any other consciousness resides – free will exists, but not in an unlimited form.

3 Comments on Saras’ ‘choice matters’

Sarasvathy presents her own, very readable reflection on the multiverse and its consequences for an individual’s possibility to make any choices; the title ‘choice matters’ might be understood as a rephrasing of the ancient problem of free will. Saras’ ‘writing strategy’ is to avoid physical theorizing and language as much as possible,

⁴ The argument that the multiplicity of worlds makes it less parsimonious than collapse theories is ambiguous since there is only one quantum world which, however, has different subjective realities.

circumventing some of the more technical discussions, and using sociological and psychological theory instead. In the following, I am going to reflect on her theorizing, partially putting it back into the physical framework. I have two reasons for doing that. One is that the reader, without this help, might be confused to see two very different types of theorizing on the multiverse (Guido's and mine, with some important differences already, versus Saras'), side by side in this mini-symposium, and must wonder what the relations are between the two. The other is my conviction that current theories from the social sciences are singular-universe theories that, without any physical qualification/critical discussion, may not be used in a multiverse context. The way I am going to proceed is referencing two parts of Saras' paper (indented) and commenting on them.⁵

Assuming that at least a subset of choosers consist in life forms capable of only finite existence in time, and given the amount of time spent in physical/biological sustenance as well as the exigencies of evolving consciousness capable of choice in the first place, the actual choices made are likely (...) [a] subset of all possible choices. Ergo, in a strange way, we might have arrived at the idea that the number of universes actually coming into being may not be as large as it could possibly be. The universes that come to be depend on choices made. (Sarasvathy, in this mini-symposium).

The conclusion, i.e., where Saras *arrives*, is quite consistent with where my own, CMM concept *arrives*; it is also not in any direct contradiction to the reasoning in Guido's contribution to this mini-symposium. The reason as to why Saras' approach is closer to my approach rather than what is discussed in Guido's contribution is the fact that Saras (implicitly) opts for an *idealist* interpretation of the multiverse, as I do (Schade 2018, chaps. 2 and 4; see also above); whereas in the Oxford interpretation, a realist interpretation and at the core of Guido's contribution, consciousness is passively attached to all realities.

Anyway, within Saras' approach as well as mine, the number of conscious universes is smaller than the entirety of universes that are in principle possible, and this has to do with choices made by individuals. However, a critical reflection upon Saras' exposition is necessary, putting her theorizing (back) into a physical framework. The way I have arrived at the subset of conscious universes is via *top-down decoherence* (Schade 2018, box 2.1). An individual's consciousness, after having selected a preferred basis, produces decohering histories via entanglement within the wavefunction (see also Wallace 2012), and then, differential weight can be put on the different realities via vectorial choices (Schade 2018, chap. 8). Assuming that Saras' thoughts could generally be made consistent with a physical framework in this sense, one problem with her reasoning would still be remaining that pertains to the fact that, from mine as well as other authors' perspectives, times are *parallel* in the multiverse (Deutsch 1997; Barbor 1999). Talking about "amounts of time" as a

⁵ Clearly, more than those two parts could be discussed. I was, e.g., tempted to also comment on Saras' reflections on memory that I see in close connection with my thoughts on 'quantum brainwash' (Schade 2018, Box 6.3, pp. 108–110). But then this contribution would become far too long for a mini-symposium.

limiting factor for the number of conscious universes is nothing I could relate to in my version of the multiverse at least. Interestingly, Saras herself talks about a ‘time-less universe’ towards the end of her contribution.

Another potential issue came to my mind when reading the above-referenced passage from Saras’ contribution. Unless nothing is said about the ‘coordination’ of choices made by different individuals (i.e., which restrictions apply), it is unclear how Saras is going to address the ‘*mindless-hulk*’ problem (Barrett 1999), brought up within the philosophy of science, in the context of the multiverse (see above). If *interacting individuals* choose in favor of *diverging* realities, they might finally be interacting with zombies (entities without consciousness). Solving this problem is a serious matter and finally led me to developing the CMM (Schade 2018). That this problem is indeed highly relevant within Saras’ theorizing becomes clear within the next quoted passage, because—as I do in my CMM concept—Saras considers the prevalence of multiple actors and their interaction, i.e., the *cocreation of reality*, as central.

(...) [The] fact of the world consisting of multiple actors who cocreate the world within which they act has important implications for how we think about the very concept of a “decision,” let alone how we conceptualize the decision-maker or more generally, the self. A major stream of work in social psychology painstakingly and painfully identifies various ways in which our decisions are subject to subconscious and situational cues (...) [see the references in Sarasvathy’s paper]. Again, we are inescapably confronted with the need to rethink the very idea of a “decision.” (Sarasvathy, in this mini-symposium).

As with the previous one, the general thrust of this passage is quite consistent with the view that I have presented within the CMM. Specifically, the view that reality is *cocreated* by different individuals is exactly the view I propose: I call sets of cocreating individuals *minds clusters*. This also applies to the fact that the very concept of a ‘decision’ has to be rethought because of acting in the multiverse, a large role is played by subconscious and situational factors etc. (Schade 2018, chaps. 4, 8–10). What I find critical in Saras’ reasoning is that singular-universe theories from the social sciences are used to make those points, and that Saras is not linking her thoughts back to the physics of the multiverse. Once this is done, one realizes that the impact of subconscious cues, the reconceptualizing of ‘decisions’, etc., that Saras rightly postulates have to be quite specifically guided by multiverse physics and the discussion to be found within the philosophy of science; avoiding the *mindless-hulk problem* becomes an inevitable guideline. I have shown how a restriction system for individual decisions, avoiding the unappealing consequence of interacting with zombies could be built up, based on physics and philosophy (Schade 2018, chaps. 4, 8, 9).

Summarizing, Saras contribution is creative in avoiding physical theory by using singular universe non-physical theory (and thus making it an easier read for social scientists) and quite consistent in her conclusions with my own approach, the CMM. The reader of this mini-symposium can be assured that there are no severe inconsistencies in terms of conclusions between the three multiverse contributions by Guido, Saras and Christian. However, I feel that it is not advisable, from a standpoint of

scientific progress, to almost completely disentangle multiverse theorizing from physics and philosophy of science.

4 Concluding remarks

For me, the small group of people participating in the Humboldt-Kreis turned out to be perfectly composed. The spirit of the workshop as well as the knowledge generated by the mutual exchanges during the workshop and in the aftermath was close to optimal. I feel that this should not be the last workshop of this kind.

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