

## Quantum Social Science: Too Elegant not to be True?\*

양자사회과학: 너무 우아해서 믿지 않을 수 없다고?

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Alexander Wendt's first book, the well-known *Social Theory of International Politics*, has become one of the most influential pieces in the field of international relations (IR) since its publication in 1999. Therefore, it was surprising that the author dedicated most of his reply to his critics to an auto-critique of his own approach and introduced a new research project – a quantum theory of social science (Wendt 2006). In the decade that elapsed between this declaration and the resulting book, we had the opportunity to explore some of the ideas of this project (Wendt 2006, 2010) and study its critics as well (Wagner and Gebauer 2008, Evangopoulos 2013). However, the resulting book shows that the earlier criticisms were somewhat premature. In contrast to previous outcomes (which introduced only the general idea and some of its main components), the book offers a complex whole that brings together findings from many fields of social and natural science and composes them into an integrated picture that claims, correctly in my view, to challenge some of the most fundamental assumptions upon which contemporary social science is built. So what are the findings of this long-awaited book?

This review consists of three parts. We start with the main argument that is

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introduced in the first chapter of the book and gives rationale to the rest of it. Then we review the structure and content of individual parts and chapters. The third part presents three main criticisms of this new unified ontology. Because the book is very rich in its argumentation and draws inspiration from a very broad scope of fields—reaching from neuroscience to the philosophy of quantum physics—we cannot go into details. We restrict ourselves and track only the main line of the argument.

The book *Quantum Mind and Social Science: Unifying Physical and Social Ontology* (Wendt 2015) answers two central questions: “(a) how might a quantum theoretic approach explain consciousness and by extension intentional phenomena, and thereby unify physical and social ontology and (b) what are some implications of the result for the contemporary debates in social theory?” (29). The book does not introduce a new social theory; nevertheless, it discusses some of the implications that would follow if the 'quantum ontology' had been embraced and gives the future theory a radically new meta-theoretical basis. The book is also not dedicated specifically to IR. The reason for this is the general scope of the inquiry presented. Thinking about the place of human (and social phenomena) in the world is not IR-specific, and the author purposefully stays at a general level. Even if the framing of the debate and choice of cases (explaining versus understanding debate, state as the social structure) are IR-specific, the findings can easily be adopted in the other fields of social science.

The first chapter of the book introduces the main argument. A problem that author aims to solve consists of the contradiction of four statements that are valid for contemporary social science: (1) only explanations consistent with the causal closure of physics are considered as legitimate scientific explanations (i. e. only physical phenomena have causal effects in the physical world); (2) the theory of physics that is relevant for social science is the classical one; (3) causal closure of physics (CCP) based on classical physics excludes the causal effects of consciousness (and thereby all intentional phenomena); and (4) social scientists need consciousness and intentionality in their theories, which leads to the contradiction with CCP.

In other words, we face the old mind-body problem. On the one hand, we can have a theory that is consistent with the classical worldview, but then consciousness and intentionality are just epiphenomena with no real effects and there-

fore have no place in the theory. On the other hand, we can equip consciousness and intentionality with causal power in the material world but then they (a) have to be admitted into our view of physics, or (b) we have to renounce CCP as the necessary condition for our theories. Wendt, as we may expect, argues that consciousness and intentional phenomena are crucial for social science. For him an ontology of the material world with no trace of consciousness is an ontology of death, which clearly is not the best basis for social science. Therefore, he looks for a way to get consciousness back into the picture.

The solution that Wendt offers stems from the adoption of the hypothesis of the quantum mind. It says that the mind is a macroscopic quantum phenomenon and therefore compatible with physicalism, because “in quantum physics physicality can encompass mentality” (27). How does this resolve the contradiction introduced above? Rewritten from the quantum-mind perspective, Wendt's statements become: (1) only explanations consistent with the CCP are considered as legitimate scientific explanations; (2) the relevant theory of physics for social science is quantum; (3) CCP based on quantum physics does not exclude (and therefore allows for) the causal effects of consciousness and all the intentional phenomena; and (4) social scientists need consciousness and intentionality in their theories, which is (thanks to the acceptance of the quantum mind hypothesis) consistent with CCP.

The reasoning in the previous paragraphs can be summarized with another narrative from Wendt. He points out that the problem we face (the mind-body problem in social science, e. g. in the form of the agent-structure problem) has been dealt with from many perspectives for centuries with little progress. He suggests that social science based on classical physicalism (materialism) contains inner contradictions and therefore can never reach a solution. “When philosophical debates persist for a long time with no apparent progress, one way to gain traction is to look at what all sides have in common. In the mind-body problem a key, generally unstated assumption is that the nature of the body is clear, and as such ‘the problem’ is with the mind” (29). But “[r]egardless of which interpretation of quantum theory one prefers, the existence of such debate shows that the nature of matter is no less mysterious than the nature of mind” (29–30).

How can we re-formulate our concept of the physical world to bring consciousness and intentional phenomena back in the picture? Wendt's solution is the

above-mentioned quantum mind hypothesis, which consists of two parts. First is the quantum brain theory, which “hypothesizes that the brain is able to sustain quantum coherence – a wave function – at the macro, whole-organism level” (p. 30). The quantum brain could explain the presence of quantum phenomena in the macro-world, but by itself would not suffice to explain consciousness. We need a second ingredient, panpsychism, which is an old idea that has been revived in attempts to interpret quantum theory. According to panpsychism, the inner experience (mind) neither stems from a material basis (supervenience or emergentism) nor is independent of matter (dualism); rather, mind is an integral part of matter. In opposition to approaches which prefer matter over ideas (materialism) or ideas over matter (idealism), panpsychism provides a type of neutral monism, which holds as an ontological prior a single underlying reality comprising both mind and matter.

Put together, quantum brain theory and panpsychism offer the following picture. Consciousness (inner experience) is based on the existence of the brain in the quantum state of superposition. Individual action (and thereby causal influence in the material world) follows from the collapse of the superposition into some basis state, a “process” forced by will. The ability to sustain the quantum system in a coherent state is, therefore, one of the key features of life. Inner experience, on the one hand, goes “all the way down” to the level of individual photons and electrons that, e.g. in the experiment, “decide” among variants that are present in their superposition. On the other hand, the “life force”, which is omnipresent at the micro-level, is not common at the macro-level due to the process of de-coherence. Only some structures (hypothetically a brain) can sustain coherence at the macro-level and are, together with panpsychism, responsible for the existence of consciousness.

Key empirical evidence supporting this difficult-to-accept hypothesis comes from recent findings in cognitive psychology. Using quantum models of decision-making, which ascribes the logic of quantum theory to human cognition and decision-making, this field has explained many well-known anomalies such as the order effect, preference reversal, and the conjunction/disjunction fallacy (e. g. the famous experimental results from Kahneman and Tversky regarding “wishful thinking”). The authors of these studies usually “have been cautious in speculating about the philosophical implications of their work” (5), advocating an “as if” approach,

which treats quantum logic simply as a new mathematical model that explains previously anomalous behavior. “While this ‘as if’ strategy has pragmatic attractions, it overlooks the fact that quantum decision theory’s success at the behavioral level fulfills a key prediction of a controversial hypothesis about what is happening deep inside the brain: quantum consciousness theory, according to which consciousness is a macroscopic quantum phenomenon.” (ibid.)

We have to emphasize once more that, even with the results from cognitive psychology, the book does not intend to introduce a testable theory. Wendt puts forward an alternative meta-theory that cannot be tested even in principle. The goal of this philosophical reflection is to introduce quantum meta-theory as a viable alternative to classical theory and show that, contrary to its apparent inadequacy, it is no less acceptable than the current discourse, which leads to the rejection of inner experience and intentional phenomena.

Now, with the overall case for quantum social science already outlined, we explore the structure of the book and how its individual parts contribute to the general argument.

The book consists of two main parts. The first half of the book (parts I and II) is dedicated to quantum theory (QT) and the quantum mind hypothesis. The second half (parts III – V) explores what the acceptance of a unified ontology based on QT would mean for some of the persistent questions of social science. The author introduces three main debates: explanation versus understanding (objective versus subjective perspective), agent versus structure, and material versus ideal factors (which is reflected in both of the previous debates). According to Wendt, all these problems are “local manifestations” of the mind-body problem. He touches upon all of them in the book, but his main focus remains on the ontology of social science and its implications for the relationship between agents and social structures.

At the beginning of the first part, the key concepts of QT are introduced (chapter 2). The reader is made familiar (thanks to the non-technical introduction) with quantum superposition, the wave function, wave-particle duality, the measurement problem, and quantum entanglement. The author contrasts them with the classical worldview and shows how they challenge some of its key features, partic-

ularly materialism, atomism, determinism, mechanism, absolute space and time, and the subject-object distinction (ch. 3). While the laws of quantum physics are unambiguous and have been convincingly verified in many experiments, their interpretation is not clear. Chapter 4 deals with this problem and explores some possible interpretations, with representatives from both materialist and idealist camps.

The second part of the book focuses on the quantum mind hypothesis. The author presents current theories of the quantum brain (ch. 5), the idea of pansychism (ch. 6), and finally quantum vitalism (ch. 7), where he explicitly connects quantum coherence with three features of life: cognition, (free) will, and experience.

The third part is dedicated to the quantum model of man<sup>2)</sup>, where these three faculties of life are elaborated in relation to the individual human-being. Individual chapters deal with the question of quantum cognition and decision-making (including quantum game theory; ch.8), agency and free will (ch. 9) and, for the case of experience in general, the non-local experience in time (ch. 10).

The fourth part focuses on social structure. Analogically to the previous part where he uses the results from cognitive psychology, Wendt builds on recent findings from linguistics and shows how quantum logic can explain some phenomena in language (ch. 11), which in turn provides the basis for social phenomena at the level of society as a whole (ch. 12). The main points here are contextuality, holism of meaning, and intersubjectivity.

The last part of the book builds upon findings from parts III and IV and explores the interaction between agents and social structure. It introduces an ontology which is emergent —holistic but flat (ch. 13). Social structures are shared wave-function potentialities, which become realities when an agent acts in accordance with them. They emerge by the same process as the agents themselves. The last step is the vitalist ontology of social structure (state) as a holographic organism endowed with

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2) Wendt acknowledges the feminist critiques of the term 'man' as a stand-in for humans in general. "Today one might prefer 'Person' to 'Man', who in models of man discourse feminist theorists have argued really was a man in the past and thus not representative of human being. However, 'Person' is clumsier, and I also don't think the model that emerges below is vulnerable to the feminist critique, since in his essentially relational character Quantum Man is if anything a Woman. Either way, for the sake of balance, I will refer to Classical Man as 'he' and his Quantum partner as 'she'" (149).

collective consciousness (ch. 14). It is admittedly the most speculative part of the book, but consistent with an extrapolation of the quantum mind hypothesis into the realm of the shared wave-function.

Wendt dedicates his conclusion to epistemology. He stays loyal to scientific realism and directly compares classical and quantum formalisms as alternative meta-theories of how the world really works. Using “Interference to the Best Explanation” (in particular the criteria of coherence, breadth, and simplicity), he speaks for a quantum science which unifies ontologies of natural and social science, and would therefore likely lead to predictions that more precisely parallel the real world. “Nevertheless, given that quantum consciousness theory and quantum social science are both in their infancy, it is difficult to draw this inference convincingly today, which is good reason for readers to take an ‘as if’ rather than realist attitude toward these ideas” (293).

We can expect this book will be controversial. What are the main objections that can be raised?

Firstly, what about the construction of the argument itself? It can be argued that some key parts are not well established and may soon be disproven empirically. This is e. g. the case of quantum brain theory, which seems to lack substantial support even among neuroscientists. We could dismiss his work as mere speculation, for its foundation does not stand upon strong grounds. However, the argument has a second element that does not depend so much on the individual constituents: an overall coherence and ability to explain (or predict) many well-known phenomena with a single axiomatic framework. The argument is more like a puzzle – we need most of the pieces to be able to see the whole picture. If some of the pieces turn to be false or inaccurate, the overall picture will not change (assuming there are not too many bad pieces). In composing it, Wendt has already done great work; the result is convincing enough to at least accept it as a viable alternative to the classical framework.

However, my general support for his approach does not extend to some of the implications in the second half of the book. I refer particularly to the argument which extrapolates quantum effects beyond the individual level to entangle individuals with one another and with social structures into coherent wave-functions.

(This step is done between entanglement of concepts in language and entanglement of partners in dialogue using language). Another, simpler solution would also account for the anomalies left unexplained by the classical CCP: the shared superposition of perspectives entangled at the individual level. This would preserve quantum effects at the level of the individual agent but, due to the conception of the agent that is entangled with the conceptions of others or social structures, still exhibit holism and contextual character. Sharing this superposition across society (via language) would bring empirically-known stability. In contrast, Wendt proposes the entanglement of agents in which a decision (or speech act) by one agent directly influences the other. This seems to challenge the free will he had intended to bring back into the ontology. After a detailed re-reading of chapters 11 to 14, I have to say that most of the author's implications are compatible with this simpler model; however, details differ. From my point of view this is inconsistent with the logic of the "puzzle-argument"; nevertheless, it does not significantly challenge the overall argument. Moreover, it is a question that we can discuss in depth after establishing a more detailed conceptualization of the quantum model, ideally with the assistance of mathematical formalism.

My second point relates to scientific realism: why not take an "as if" approach? With respect to the inaccessibility of quantum theory and apparent gaps which lay on the way to a would-be quantum social science, shouldn't we approach quantum logic only as an inspiration for the new social model? Some research presented in the book shows that this is possible and can lead to the very interesting results. But if it is true that social scientists take the classical worldview at face value but we actually live in a quantum world, we can expect that the acceptance of the quantum mind hypothesis would lead to new discoveries. The quantum model could be especially important for the debate between the positivists and interpretivists in social science. Thanks to its neutral monism, it could incorporate both methodologies into one framework. But wouldn't this create a new hegemony that could be proven false in the future, as could the classical one now? Such a possibility always exists, but just as the quantum physics does not annul classical theory (it simply generalizes it), a new theory does not have to annul quantum theory. In the meantime, we can use quantum ontology to refine our present theories and explain some phenomena which are considered anomalies in the classical



framework.

Finally, I would like to propose one question which is not elaborated upon in the book: the nature of free will in the quantum model. If consciousness is related to the superposition of the quantum brain, and will is the “force” responsible for the collapse of superposition into one of the basis states, we face a weirdly dual nature of free will. On the one hand, any state which is present in the original superposition can be chosen. On the other hand, the superposition precisely indicates distribution of individual outcomes. In other words, results of repeated measurements should follow the probability distribution function given by the original superposition. To what extent is the decision free if we e.g. know that A will be chosen in 70% and B in 30% of the cases? Moreover, what does this probability mean for the individual case? Is it a subjective probability of individual outcomes? If so, do we have access to this subjective probability (e.g. by knowing the context of the decision-making)? And isn't this duality the source of the debates between quantitative and qualitative methodology in social science?

The book offers many similar questions and will spark many future debates. It remains to be seen whether it will mark the beginning of a new research program (in the Lakatosian sense) or be dismissed as a dead end. Regardless, the meta-theory based on classical physics has a competitor that deserves our attention.

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