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Document Version
Accepted author manuscript

Published in:
Academy of Management Review

DOI:
[10.5465/amr.2019.0480](https://doi.org/10.5465/amr.2019.0480)

Publication date:
2021

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Citation for published version (APA):
Li, X. (2021). Quantum Approach to Organizational Paradox: A Copenhagen Perspective. *Academy of Management Review*, 46(2), 412–415. <https://doi.org/10.5465/amr.2019.0480>

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Download date: 18. Jan. 2025



Quantum Approach to Organizational Paradox: A Copenhagen Perspective

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Abstract

This paper comments on Tobias Hahn's and Eric Knight's quantum approach to the ontology of organizational paradox. By addressing the problems of their application of quantum physics to organizational paradox research, we aim to move the mainstream thinking on organizational paradox beyond the dominant 'both/and' thinking toward a 'neither/nor' thinking that is the essence of the Copenhagen Interpretation of quantum theory. We posit, embracing the 'neither/nor' thinking, just like the shift from the 'either/or' thinking to the 'both/and' thinking, affords management scholars a much broader cognitive space in which resolving paradox may not be, as the mainstream organizational paradox scholars currently think, impossible. In our alternative quantum approach to organizational paradox, any paradox or paradoxical tension is caused by the asymmetry between one's capacity and expectation, and the principle of paradox resolution is then the reduction of the asymmetry by either increasing one's capacities or decreasing one's expectations or doing both simultaneously.

Accepted on 12 Dec. 2019 for publication at

Academy of Management Review

INTRODUCTION

In attempt to reconcile the debate between the inherent and constitutive (social-constructivist) views on the ontology of organizational paradox, Hahn & Knight (2019) apply principles of quantum mechanics to advance a 'both/and' synthesis of the debate, arguing organizational paradox is ontologically both inherent and constitutive. In so doing, they have made a timely contribution to advancement of 'the paradox lens' (Smith & Lewis, 2011). While we appreciate and commend Hahn & Knight's effort to draw our attention to one of the most fundamental issues regarding organizational paradox, we are not convinced by their representation of the thinking pattern of quantum theory and their application of quantum principles of superposition and wave function collapse to organizational paradox. By addressing the problems of their quantum approach, we aim to move the mainstream thinking on organizational paradox beyond the dominant 'both/and' thinking toward a 'neither/nor' thinking that is the essence of the Copenhagen Interpretation of quantum theory. We posit, embracing the 'neither/nor' thinking, just like the shift from the 'either/or' thinking to the 'both/and' thinking, affords us a much broader cognitive space in which resolving paradox may not be, as the mainstream organizational paradox scholars currently think, impossible.

QUANTUM THINKING IS NOT BOTH/AND BUT NEITHER/NOR

Following in the footsteps of Lord et al. (2015), Hahn & Knight (2019) identify the thinking pattern of quantum theory as ‘both/and’. This is evident in their statement (p. 4, italics in original) “by mobilizing the ontological underpinnings of quantum mechanics, we develop a quantum approach (see Lord, Dinh, & Hoffman, 2015) to the ontology of organizational paradox as being *both* socially constructed *and* inherent in organizations.” In our view, depicting quantum thinking as ‘both/and’ is problematic because the historical development of knowledge about light and matter clearly reveals the evolution of human thinking from ‘either/or’ to ‘both/and’ to ‘neither/nor’.

At the beginning of the twentieth century, physicists were confronted with the wave-particle paradox, which is explained by Albert Einstein as follows:

“But what is light really? Is it a wave or a shower of photons? ... There seems no likelihood of forming a consistent description of the phenomena of light by a choice of only one of the two possible languages... We have two contradictory pictures of reality; separately neither of them fully explains the phenomena of light, but together they do!” (Einstein & Infeld, 1938: 278).

Toward the end of 1920s, the Danish physicist Niels Bohr and his associates came up with a coherent explanation of the paradox known as Copenhagen Interpretation of quantum mechanics. According to Bohr’s complementarity principle, any quantum object has both wave and particle properties as complementary aspects of a single reality. Some sort of measurement is needed to observe the properties of subatomic object, e.g., electron. Experiments designed to measure the wave properties of an electron will show the wave aspect, while experiments designed to measure the particle properties will show the particle aspect. Although wave and particle descriptions are contradictory, they are complementary and indispensable for describing a quantum object.

On the surface, Bohr’s complementarity principle seems to represent a ‘both/and’ thinking (Li, 2014). Yet, on a deeper level, it, at least Bohr’s later elaboration of it, reveals a ‘neither/nor’ thinking, as Plotnitsky (2013: 8) points out:

“Bohr’s earlier approaches to complementarity [...] were shaped by the apparently necessary use of certain mutually exclusive conceptions in quantum theory, such as those of particles and of waves... Even at this stage of his thinking, however... he avoids... the concept of wave-particle complementarity altogether. I would argue that wave-particle complementarity, with which the concept of complementarity is arguably associated most, did not play a significant, if any, role in Bohr’s thinking, at least after the Como lecture and even there, Bohr’s ultimate solution to the dilemma of whether quantum objects are particles or waves—or his ‘escape’ from the paradoxical necessity of seeing them as both—is that they are neither.”

The insight that light is neither wave nor particle was later affirmed by R. P. Feynman who shared the Nobel Prize in Physics in 1965 for his fundamental work in quantum electrodynamics. Feynman declared, “Historically, the electron, for example, was thought to behave like a particle, and then it was found that in many respects it behaved like a wave. So it really behaves like neither. Now we have given up. We say: ‘It is like *neither*.’” (Feynman, Leighton, & Sands, 1963: 37-1, italic in original).

PROBLEMS OF HAHN & KNIGHT’S QUANTUM APPROACH

Hahn & Knight (2019) apply their ‘both/and’ view to reconcile the debate between the inherent and constitutive views. A key difference between the inherent view and the constitutive view concerns the notion of latency as a valid ontological dimension of organizational paradox. While the inherent view holds it dear, the constitutive view rejects it outright by arguing that a latent state of paradox does not exist and paradox emerges “as a product of actors’ mental and discursive

construction in cognitive and social processes” (p. 56). To reconcile the two views, Hahn and Knight first support the inherent view of latency by arguing “Paradoxes exist in a latent state irrespective of their recognition, but only in terms of potential paradoxes”, and define latency as “capture[ing] the indeterminate and probabilistic potentiality of all possible paradoxes in a specific organizational situation” (p. 56). They then supplement a constructionist notion of salience, namely, salience results from “the selective enactment of paradox in a specific socio-material context, drawing from the possibility space of indeterminate latent paradoxes” (p. 4).

Here, Hahn and Knight adopt, unconsciously or purposefully, a strategy of disguised replacement of concept. While the constitutive view talks about the salience of paradox as a generic term, namely, any paradox is a product of actors’ mental and discursive construction, Hahn & Knight’s constructionist notion of salience theorizes, instead, that specific paradoxes are selectively enacted from the possibility space of latent paradoxes. Their theory avoids an explanation of how any paradox is constructed from non-existence, because they have presupposed existence of latent paradoxes. Consequently, although their argument of salience is constructivist in nature, it is not social-constructivist of the constitutive review’s type, and hence, they have not succeeded in integrating the two views.

Hahn & Knight’s application of the quantum principle of superposition to organizational paradox is problematic. As the principle says the state of a quantum object is indeterminate and in superposition, i.e., having simultaneous multiple states, it is clear that their use of the phrase “the possibility space of indeterminate latent *paradoxes*” (p.4, italic added), violates the principle by presupposing existence of paradoxes that are characterized by determinateness, given their concept of paradox is defined by a definite feature, i.e., “persistent contradictions between interdependent elements” (p. 6).

Their application of the quantum principle of wave function collapse to organizational paradox is also problematic. They state, “In our quantum approach, the situated enactment of paradox represents a measurement or observation of the indeterminate latent state that brings some paradoxes into actual reality while not enacting other potential paradoxes” (pp. 27-28). Their notion of ‘selective enactment’ (p. 4) is another disguised replacement of concept. In Copenhagen Interpretation of quantum mechanics, the interaction between the quantum object and the measurement apparatus (and the subject doing measurement) causes the collapse of the infinite possible states of a *single* quantum object (e.g., electron) into a fixed state. The logic of Hahn & Knight’s ‘selective enactment’ can lead us to think that the measurement would and should instead have selected out some electrons out of infinite number of potential electrons, which is of course not what wave function collapse is all about.

Hahn & Knight’s application of their ‘selective enactment’ thesis to the case of paradoxes of social enterprise is even more problematic. They point out, while the literature often portrays social enterprise as “inherently paradoxical organizations par excellence since social mission and profitability represent two competing but interdependent core elements of social enterprises...as Child (in press) found, social entrepreneurs oftentimes do not experience their organizations as paradoxical” (p. 4). They then adopt their quantum approach to explain “the seemingly contradictory findings that social entrepreneurs often do not experience paradoxes while acting in highly paradoxical settings” (p. 26). However, their explanation once again is a disguised replacement of concept. Namely, instead of explaining the specific paradox that the same social mission-profitability relationship is *often* viewed paradoxical by *some* social entrepreneurs but non-paradoxical by some others, Hahn and Knight try to shift our focus away from the so-called

“simplistic juxtapositions of social and business logics” toward “paradoxes other than the emblematic business-social paradox” such as “aspects of identity or exploration and exploitation” (pp. 26-27). Put straightforwardly, Hahn & Knight’s response to this business-social paradox is: don’t just focus on it, let’s talk about some other possible paradoxes.

AN ALTERNATIVE QUANTUM APPROACH TO ORGANIZATIONAL PARADOX

To solve the abovementioned puzzle why the same business-social relationship is experienced as paradoxical by some people but non-paradoxical by others, we propose an alternative quantum approach to organizational paradox that is, in our view, in accord with the Copenhagen Interpretation of quantum theory. At the core of our approach is an alternative application of the quantum principles of superposition and wave function collapse.

Our application of the superposition principle takes the relationship between a pair of opposites (e.g., social mission and profitability) instead of the notion of paradox as its unit of analysis or the object to be observed. We do not presuppose existence of paradox(es) prior to observation but instead argue that, like a quantum object, the state of the relationship is indeterminate, i.e., potentially being paradoxical or non-paradoxical or both, prior to observation. In other words, prior to observation, the relationship is in a state of superposition, i.e., having all possible degrees of paradoxicality, a concept borrowed from Cuonzo (2014).

Our application of the wave function collapse principle revolves around the notion of asymmetry between capacity and expectation of the person dealing with the pair of opposites. We argue paradoxical tension is caused by the positive expectation-capacity asymmetry, namely, a person will experience tension when his or her expectation of something exceeds his or her capacity for achieving it. Otherwise, the person will not experience tension if his or her expectation falls below his or her capacity (the negative asymmetry case) or if his or her expectation is at the same level as his or her capacity (symmetry or zero asymmetry). For a same thing (e.g., balancing social mission and profitability), different people have different degrees of asymmetry.

Our quantum approach posits, prior to observation by or interaction with a human being, the relationship between a pair of opposites (e.g., social mission and profitability) is indeterminate and in a state of superposition, i.e., having infinite possibilities in terms of degree of paradoxicality. Upon talking about a particular person, the relationship’s indeterminate state interacts with the person’s degree of asymmetry, resulting in the collapse of the superposition to a fixed state, i.e., a specific degree of paradoxicality (e.g., being paradoxical or non-paradoxical). Because different people have different degrees of asymmetry between their capacities and expectations, they will experience different degrees of paradoxicality with regard to the relationship between a same pair of opposites. This is why, for the relationship between social mission and profitability, some social entrepreneurs experience paradoxical tensions while others do not.

An intuitive explanation for such a difference is that, compared to those who struggle with the business-social paradox, the more experienced social entrepreneurs may have either higher capacities or lower expectations or both. One plausible situation of having lower expectation is that the person’s behaviors are mainly driven by intrinsic rather than extrinsic motivations so that he or she does not care or does not care too much about how others judge his or her conducts.

In sum, our quantum approach to organizational paradox is underpinned by the ‘neither/nor’ thinking, namely, paradox is *neither* inherent *nor* socially constructed. Instead, it is caused by the asymmetry between one’s capacity and expectation. Understood in this way, organizational paradox is not, as the mainstream scholars currently think, impossible to be resolved. The principle

of paradox resolution is then the reduction of the asymmetry by either increasing one's capacities or decreasing one's expectations or doing both simultaneously.

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