A Comparative Study between Quantum Mechanics and Yogācāra Buddhism on Properties of Material Objects

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Abstract

With the development of quantum mechanics, the knowledge of properties of material objects has been greatly changed, quite different from what people have taken for granted as well as that in the classic physics. Since Yogācāra is considered to be one of most compatible Buddhist theories with modern science, in order to see exactly how close Yogācāra is to quantum mechanics, this article aims at comparing quantum mechanics and Yogācāra on properties of material objects from three aspects, the source of material objects, their substantiality, and the interference from the mind. By doing this, a conclusion is made that the two have same opinions at a general level but different, to certain extents, from each other at a specific level.

Keywords: quantum mechanics, Yogācāra, material objects

Introduction

In classic physics, a material object is often considered to be a kind of substantial existence with certain amount of mass and is made of fundamental physical elements such as atoms, and is often considered to be different and dispensable from the mind. These properties, though quite consistent with the sense of ordinary human beings[1], is actually contradictory to one of the most important Buddhist ideas Yogācāra, which believes that there is nothing substantial in the world except consciousness and there can be no fundamental physical elements that make up physical objects.[2] However, with more and more puzzling findings emerging in quantum mechanics, science, specifically quantum mechanics, seems to have been put closer to Buddhist theories especially Yogācāra. So here the questions are

1) What does the quantum mechanics say about properties of a material object?
2) What does Yogācāra say bout about properties of material objects?
3) To what extent are they similar to each other on this point?

In order to answer these questions, this article is trying to compare quantum mechanics and Yogācāra Buddhism on these three properties of material objects:

1) the source of material objects
2) the substantiality of material objects
3) influence from the mind on material objects.

This comparison will start with the analysis of properties of material objects in quantum mechanics, followed by the analysis of that in Yogācāra, concluded at last concerning the similarities and differences of the analyses above.

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[1] Korman, Daniel Z., "Ordinary Objects", **The Stanford Encyclopedia of Philosophy** (Spring 2016 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2016/entries/ordinary-objects/>.

[2] Master Xuanzhuang, **Cheng Weishi Lun Zhijie** (A Direct Translation and Commentary to Discourse on the Perfection of Consciousness-only, Chinese Edition), tr. Lin Guoliang, (Shanghai: Fudan Press, 2007), pp. 14-16.

Properties of Material Object in Quantum Mechanics

Quantum mechanics is a kind of physics that mainly studies the features of the substances and their motion and interaction at the atomic level. These substances are mainly electrons, protons, neutrons, quarks etc.[3]

Different from the description of matter in traditional ways, these substances don't take any form of matter, since they don't have mass, nor do they take any space. They are measured by the unit of energy, quantum. Quarks are considered to be the smallest elements that constitute material objects. So far hundreds of quarks have been found. There are so many kinds of quarks that Leonard Susskind and others considered it necessary to unify all of them into one. Therefore, he proposed the theory called String Theory which states that all of the quarks are actually different forms of vibrating strings of energy. Different frequency and form will result in different kinds of quarks, thus different atoms. That is to say all of the material objects have the same source which is strings of energy.

At the subatomic level, there is a phenomenon called particle entanglement, where if two particles are entangled and one spins towards one direction, the other will automatically spin towards the opposite direction. No matter how far the particles are from each other, the result will always be the same. It's obviously not possible for these particles to have any signal connecting them because these particles are moving in the speed of light and nothing can move faster than the light. So even there's signal, it can't connect them. Many scientists try to explain this phenomenon with other theories. One of these theories seems to be plausible is Holography Theory, which believes that the entangled particles the scientists have detected are actually not two separated particles, but two images projected in different angles from a deeper entity that has not yet been detected. It has the same mechanism as the surveillance system, in which different screens show different sides of one person who's being shot by the cameras fixed at different corners of the room, so when this person moves, all of the images in different screens move. If someone doesn't have any knowledge of surveillance system, he will probably think each screen displays the image of one person, and he'll surely be confused why these people move at such a surprisingly concerting pace.

There is another phenomenon in quantum mechanics that is superposition, which refers to the state in which particles possess different forms of existence at the same time.

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[3] Ismael, Jenann, "Quantum Mechanics", The Stanford Encyclopedia of Philosophy (Spring 2015 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2015/entries/qm/>.

For example, the radioactive Atom B-212 has been proved to possess the status of decaying and not decaying at the same moment after 60 minutes' existence. However, this kind of phenomenon sounds rather strange and one of the scientists Schrodinger carried out a famous experiment in order to prove the absurdity of the existence of superposition. In this experiment, a cat is put into a concealed case together with a small case containing Atom B-212. And the small case is fixed with a string with the end tying a hammer, below the hammer is a little bottle containing toxic liquid. When Atom B-212 decays, the string will plummet, and the hammer will smash the bottle, and the toxic liquid will turn into toxic gas which will eventually kill the cat within the larger case. If the the atom does not decay, then the cat will be alive. According to the statement of superposition, after 60 minutes, the Atom B-212 will be in the status of both decaying and not decaying, which means the cat will be in a status of being both dead and alive. This, of course, is highly unlikely according to our human experience as well as commonsense, because when opening the case, there can be only one result, that is the cat is either dead or alive. Actually the explanation to is this comes from another phenomenon called collapse, which means different statuses of a particle in superposition is reduced to only one status because of an interference, an observing behavior from man. In this experiment, the behavior of opening the case and seeing whether the cat is dead or alive has ended the superposition phenomenon, if the cat is found to be alive, the status of being dead has collapsed because of the observation, vice versa. That is to say fundamentally the existence of material objects is influenced by man's mind and it depends on the mind.

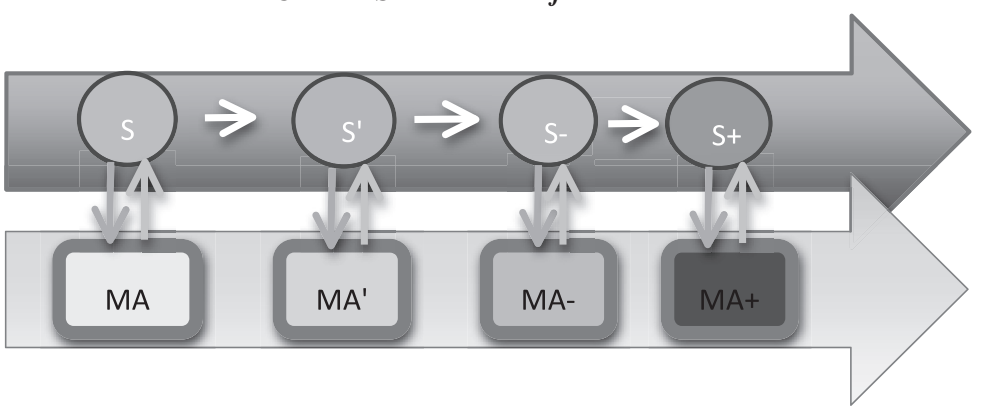
Properties of Material Objects in Yogācāra

Yogācāra is one of the most influential schools in Mahāyāna Buddhism. Its contribution to the development of this tradition is mainly known for its theoretical construction of Mahāyāna Buddhist doctrines both cosmologically and espitomologically. The word derived from Sanskrit Yogācāra has the implication of its justification based on meditation practice. Another commonly known word Consciousness-Only, translation of the Chinese word Weishi, points out the essential teaching of this theory which is that the existence of every phenomenon depends on consciousness.

According to Yogācāra, man has Eight consciousnesses. Among the Eight, Ālaya Vijñāna the Eighth Consciousness, also called Store Consciousness, is the fundamental one from which both the other seven consciousnesses and the physical world are generated by the *seeds*, the potential energy, stored in Eighth Consciousness. Because it stores numerous

seeds which are all kinds of potential energy that can produce all of the phenomena that one cognizes, which is named *manifest activities*. The storage of the *seeds* have no beginning nor ending. They have been accumulated from countless lives of an individual and they are stored in the form of the Eighth Consciousness, which is so subtle that ordinary beings are not able to realize its existence at all. However, when conditions, both internal and external factors, become mature, these stored *seeds* are able to be activated and present themselves as *manifest activities*, and this process is called producing. The *manifest activities*, on the other hand, have their influence on the original *seeds* simultaneously, and this reverse effect made on the *seeds* are called perfuming. Once the original *seeds* are perfumed, new *seeds* will come into existence on the basis of the original ones also at the same time, and thus called *seeds* generating *seeds*. The Eighth Consciousness functions through such a continuous process of producing and perfuming among these *seeds* and *manifest activities*. By these non-stopping and repetitive pattern of producing and performing, new *seeds* as well as new *manifest activities* appear constantly, each resembles the previous one both on the side of *seeds* and on that of the *manifest activities*. Following is the diagram showing this pattern, with *seeds* (S) represented by the arrow above and *manifest activities* (MA) below.

Chart 1 Seed and *manifest activities*



According to this theory, material objects, including the external world and the human body are *manifest activities* produced by the *seeds* stored in the previous lives, and are still changing due to the producing process of the *seeds* newly perfumed in this life.

According to Yogācāra, material objects are not substantial, just like in a dream. The reason why people normally think material things are real is because of their dharma attachment.

> *... Therefore all attachment to dharmas has as an object apparently real dharmas that appear from the mind but are grasped as real dharmas. However, the images of apparently real dharmas are produced from conditions and are therefore like illusory phenomena. These "real" dharmas as objects of attachment are falsely imagined and thus do not really exist.*[4]

This text from *Cheng Weishi Lun* shows that the material objects outside as one perceives are actually not substantial, unreal.

> *Even though the images of this self and dharmas are within consciousness, still, due to imagination, they appear to be external. From beginningless time, sentient beings consider them to be real selves and dharmas as a result of this grasping. One is like a dreamer whose mind, because of the power of the dream, appears in the form of various external things and who consequently considers them to be really external things.*[5]

This text explains the essence of material objects is just like a dream. However, because of the attachment of the ordinary people, they appear to be real.

The process of one cognizing the physical world is essentially within the consciousnesses. In order to understand this, one must know the structure of the consciousness. For each consciousness, there are two parts, different aspect of cognizing ability of the consciousness, the seeing part (cognizing part) and the seen part (cognized part). The material objects actually are produced by the Eighth Consciousness as its seen part, and the First to Sixth Consciousnesses will produce similar image of the material object as their seen part, and their seeing part then cognizes the seen part. So the whole process indicates that the material object can only exist within the consciousnesses, as the Chart 2 shows:

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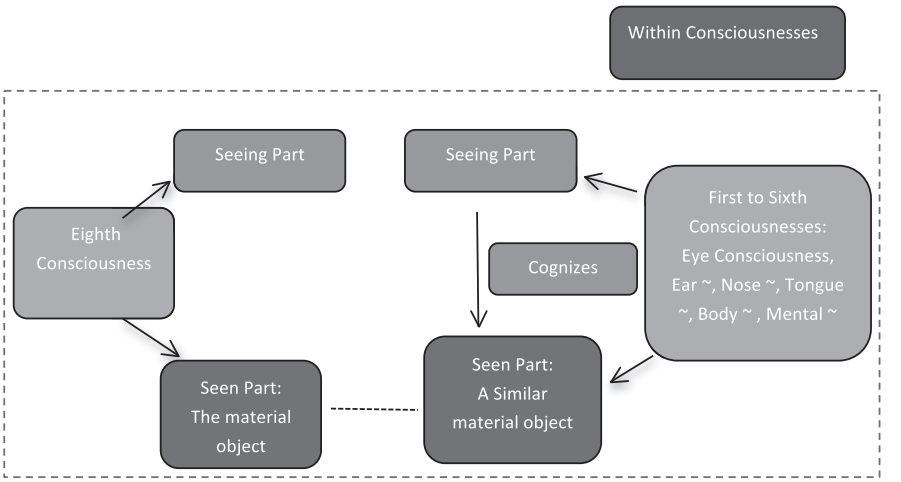
[4] Hsuang-tsang, **Demonstration of Consciousness Only**, tr. Cook, F.H., (Berkeley: Numata Center for Buddhist Translation Research, 1999), p. 40.

[5] Hsuang-tsang, **Demonstration of Consciousness Only**, tr. Cook, F.H., (Berkeley: Numata Center for Buddhist Translation Research, 1999), p. 40.

Chart 2 Cognizing Process within Consciousnesses



For example, when one sees a flower, the whole process of this seeing starts from Eighth Consciousness which produces the flower as its seen part, and Eye Consciousness will produce a similar image of the flower as its seen part, and the seeing part of Eye Consciousness then cognizes the image of the flower. Therefore, the material objects are not able to exist apart from consciousnesses.

Conclusion

For the source of material objects, both quantum mechanics and Yogācāra theory think that the source of material objects is energy, strings of energy in the former and potential energy in the latter. As for whether material objects are substantial, both give a negative answer, illusory images projected by a deeper entity in the former and objects in a dream attached by ordinary human beings in the latter. Concerning the influence of mind on material objects, both show that material objects can only exist with the support of mind, collapsing from mind in the former and the producing and the cognizing processes within consciousnesses in the latter. **Chart 3** below shows the result of the comparison:

Chart 3 Comparison between Theories in quantum mechanics and Yogācāra theory

Material Objects	Similarities	Differences	
		Theories in Quantum Mechanics	Yogācāra
Source	Energy	Strings of energy	Potential energy
Substantiality	No	Illusory images projected by deeper entities	Objects in a dream attached by ordinary human beings
Influence from the mind	Yes	Collapse caused by the mind	The producing and the cognizing processes within consciousnesses

From the comparison above, it is easy to have the conclusion that generally quantum mechanics and Yogācāra have same answers to the questions concerning some aspects of the nature of material objects, but specifically they have different elaborations on the general answers. And it seems difficult to say if these different elaborations are caused by different language usage or by incompatible opinions. Analysis of this is to be expected in future researches.

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