On the Trajectory Prediction of a Throwing Object Using New General System Theory

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Trajectory prediction for the movement of a given object is one of the main tasks for the classical mechanics but in orthodox quantum mechanics, this task was announced to be an impossibility for the (sub-)atomic particles by famous Heisenberg's uncertainty principle. Of course, such an epistemology is against the philosophical beliefs of many scientists and currently another version of trajectory quantum mechanics known as Bohmian mechanics also exists. In order to unify the conflicts among classical mechanics, quantum mechanics, and relativity theory, a new general system theory (NGST) was proposed by the present author and his colleagues. The purpose of this paper is to demonstrate that it is not the scale that matters but the living nature whether the object is lifeless or living. By using the psychic force concept introduced in NGST, Newton's second law is applied to analyze five different types of objects. They are a stone, a coin, a cat, a person, and an electron. It is found that the classical mechanics has provided adequate room to explain the various newly observed phenomena for orthodox quantum mechanics and relativity theory and for human beings various parapsychological phenomena can also be explained by classical mechanics. Therefore, it is concluded that generalization of classical mechanics is adequate and no need to develop revolutionary quantum mechanics and relativity theory.

Keywords: object type, trajectory, new general system theory, gravitational field, psychic field, classical mechanics, quantum mechanics

Introduction

Trajectory prediction for the movement of a given object is one of the main tasks for the classical mechanics (Goldstein, Poole, & Safko, 2002) but in orthodox quantum mechanics, this task was regarded to be an impossibility for the (sub-)atomic particles by famous Heisenberg's uncertainty principle (Heisenberg, 1927; 1930; Neumann, 1932; Bohr, 1934). Of course, such an epistemology is against the philosophical beliefs of many scientists such as Einstein and Schrödinger and a long debate occurred between the two schools (Whitker, 2006). Currently another version of trajectory quantum mechanics known as Bohmian mechanics also exists (Oriols & Mompart, 2019). In order to unify the conflicts among classical mechanics, orthodox quantum mechanics, and relativity theory (Einstein, 1916), a new general system theory (NGST) was proposed by the author and his colleagues (Kang & Cui, 2020; Cui, 2021a; 2021b; Ma & Cui, 2021; Pan & Cui, 2021a; 2021b; 2022).

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The fundamental idea of NGST is that every problem encountered can be viewed as a system (Boulding, 1956) and the procedure proposed in the general system theory (GST) by Bertalanffy (Bertalanffy, 1968; 1972; Chen & Stroup, 1993) can be used to solve the system problems. However, current GST lacks a unified philosophical foundation for micro and macro systems and this deficiency can be overcome by supplementing a new mind-ether ontology (Cui, 2021b) and clarification of some fundamental concepts such as universe, world, time, space, matter, mind, life, force, field, energy, work, heat, entropy, and information (Cui, 2021a; 2021b; Pan & Cui, 2021a; 2021b; 2022). The fundamental idea of unification is that we try to explain the new observations by extending the classical mechanics rather than creating a conflicting new theory such as relativity theory and orthodox quantum mechanics based on a totally different philosophical foundation and a set of different fundamental concepts. That is, we prefer generalization rather than revolution.

The purpose of this paper is to demonstrate that it is not the scale that matters but the living nature whether the object is lifeless or living. By choosing a dualist solution to the mind-body problem (Ma & Cui, 2021), a psychic force is introduced to explain the various newly observed phenomena including various parapsychological phenomena (Cardeña, 2018; Moreira-Almeida & Santana Santos, 2012). The objects studied in this paper include a stone (classical mechanics), a coin (statistical mechanics), a cat (NGST), a person (NGST), and an electron (quantum mechanics).

Problem Description

Let us assume that Bob and Smith in cooperation perform an experiment repeatedly, for example, Bob throws an object from a tower of height H and Smith on the land records its trajectory together with its state over time for N times with a purpose of constructing a general system theory to predict the trajectories of the future throws.

Figure 1 illustrates the problem schematically and the problem looks very simple. However, the object to be thrown could be various types. It varies from macro scale to micro scale and from lifeless object to living creature. Currently different theories have to be used to explain the phenomena of the same problem and some of the theories are in conflict in nature such as the classical mechanics vs. orthodox quantum mechanics. It is my belief that this conflict is not the essence of nature but just our understanding.
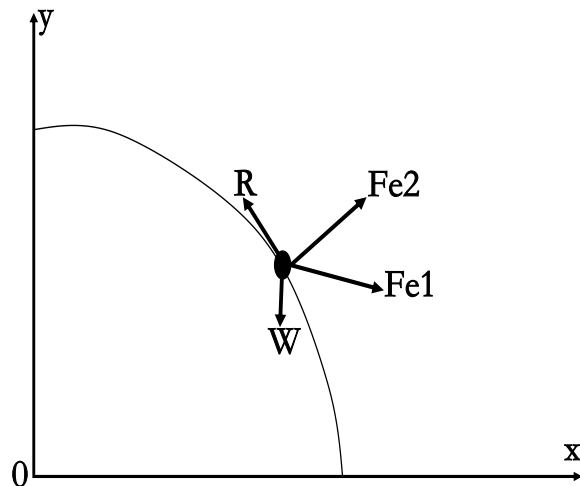

Figure 1. The trajectory of a throwing object (x-y diagram and t is in perpendicular to the x-y plane).

Problem Solving

To Make the Fundamental Assumptions

Every scientific theory is based on some fundamental assumptions (Kang & Cui, 2020) and when we use one theory we need to be clear of this limitation. In order to solve this simple problem using NGST (Cui, 2021a; 2021b), we must assume that the following preconditions exist: (1) People act as observers exist (Bob and Smith in this case). Without people, there is no such a problem and also no theory. (2) Concepts such as time, space, field, trajectory, matter, mass, force, movement, rest, position, velocity, acceleration, momentum, acceleration, coordinate system, have been defined and agreed among people. (3) People believed that the movement of any object is governed by some laws and these laws have been revealed. For the present problem, we are confined to the classical mechanics and its generalization and we try to avoid the use of any conflicting concepts and laws with classical mechanics. This is actually the requirements for NGST and so in this paper we will only apply the NGST to solve the problem.

To Construct the System Model for Analysis

The system model is shown in Figure 1. It consists of Bob for throwing the object, Smith for measuring the trajectory and the object state. Before the experiment, Bob and Smith have agreed on the coordinate system and the measurement method including the relevant equipment. In all the repeated experiments, Bob and Smith will not change their positions and Smith's position is taken as the origin ($x = 0$, $y = 0$, $z = 0$) and Bob's position ($x = 0$, $y = 0$, $z = H$). The instant at which the object is left the hand of Bob is denoted as the start of an experiment while the instant at which the object is touching the land is denoted as the end of this experiment. The actual trajectory and the state of the object from the start to the end are what we want to measure and based on the repeated measurements, we either need to confirm a theory or establish a revised theory. In this paper, we want to demonstrate that the NGST which is based on the generalization of classical mechanics is adequate to analyze all the five types of objects studied.

To Derive the Governing Equations

In order to derive the governing equations, we first need to analyze how many forces are aced on the object at a given instant of time t. In order to simplify the problem, we consider the object does not possess the unbalanced charge; thus there are no electromagnetic forces. That is, the object has only a body of mass m and a mind. The object is simplified as a particle and it moves in a plane of x and y only. Thus, its state can be defined by x, y, and t completely and its trajectory can be shown in Figure 1.

Force is defined as the interaction between two objects, no matter they are in contact or not. The non-contact interaction is also called action at a distance (Einstein, 1916). Every object must have mass and it will move under the action of non-zero net force. In order to explain the force phenomenon, we have introduced the concept of a field (Pan & Cui, 2021a). For example, let us consider a two-body system: If body A has mass only, then it will generate a gravitational field around the body and if another body is located within the field, it is subjected to the gravitational attraction force. If the body also has a mind, then, it will generate a psychic field around the body due to the mind-body interaction. Psychic force is an active force and it can exist with one object only due to the mind-body interaction while passive forces can only exist between two objects. If the body has a charge, it will generate electromagnetic field around the body. In an isolated N-body system, the field strength is the superposition of the rest of (N-1) objects except the object to be analyzed and the object is

subjected to a force from this field. In the whole universe, there are infinite numbers of objects of different types. According to the new ontology proposed in the new general system theory, there are altogether five types of fields, gravitational field, electromagnetic field, strong field, weak field, and psychic field (Pan & Cui, 2021b); the former four fields are related to the four passive forces while the psychic field is related to the active force. In terms of the direction of each type of forces, it is basically a very complicated problem for this superposition of the vector forces, but we can assume the dominance of the earth since we are located in the earth fields. All the interactions are assumed to decrease with the increase of the distance between the two objects and this property is known as the locality (Einstein, 1916). Of course, currently we only know the decrease rate for the four passive forces and even have not agreed on the existence of the psychic force. In NGST, the existence of the psychic force is assumed based on the current observations on the difference between living objects and lifeless objects but the method to calculate the psychic force is to be established.

Let us consider the object thrown by Bob is located in the earth fields, its mass is m kg and no charge, the strong force and the weak force are confined within the atom and much smaller than other forces, so these two forces are not considered in the present analysis. Thus, the object is acted by four forces: One is the gravitational force W in the direction toward the earth center; the other is the resistance R from medium which consists of micro particles including observable particles above the sub-atomic particles and the unobservable particles of ether, and the direction of R is in the opposite direction of tangential line of the trajectory; the third is the psychic force F_{e1} from the earth-mind interaction; and the fourth is the psychic force F_{e2} from the object mind-body interaction. The directions of psychic forces can be varied by relevant minds. The force diagram is also shown in Figure 1. To treat the earth as a living system was not new and this was known as Lovelock and Margulis's Gaia hypothesis (Lenton & Latour, 2018).

If we still believe that the Newton's second law is valid for this situation, the governing equation can be written as follows:

$$m(t)\frac{d^2x}{dt^2} = F_{e1x} + F_{e2x} - R_x \tag{1}$$

$$m(t)\frac{d^2y}{dt^2} = F_{e1y} + F_{e2y} + R_y - W \tag{2}$$

For the resistance R, it is found to be proportional to the velocity squares (Goldstein, Poole, & Safko, 2002), that is,

$$R_x = k_x\left(\frac{dx}{dt}\right)^2 \tag{3}$$

$$R_y = k_y\left(\frac{dy}{dt}\right)^2 \tag{4}$$

where k_x and k_y are called friction coefficients which can be measured experimentally. In Equations (1) and (2), I particularly emphasize that the mass of the object could vary with time. This is because that when the object is moving in the medium, some of particles in the medium could stick to the object or the object could radiate small particles to the medium. Furthermore, if the object is a living creature who has a mind, the object can actively accumulate other particles into its body or radiate some particles from its body. If we consider this object as a three-dimensional solid body, then there are six independent variables to describe its state, three coordinates (x_c, y_c, z_c) for the position of the center of mass together with three rotational angles along the three

principal axes of the object (θ_x, θ_y, θ_z). By applying the second Newton's law, a set of six partial differential equations can easily be established with these four forces. Since they are too complicated for the analytical solutions, they are not given in this paper.

To Establish the Initial and Support Boundary Conditions

The governing equation for this problem is a second-order partial differential equation and in order to obtain a unique solution for the trajectory and the state, we need to know the initial position (x_0, y_0) and initial velocity (v_{x0}, v_{y0}). For this simple problem of a two-dimensional particle, there is no support boundary condition involved.

To Solve the Problem

In order to solve the problem, let us discuss the problem through different types of the object.

Case 1: A stone (classical mechanics). The first case to be considered is to assume the object is a stone which is a lifeless object. All the psychic forces are zero. In the first case, if we ignore the resistance and also assume the mass does not change in the whole movement process, then the governing equations are simplified to be:

$$\frac{d^2x}{dt^2} = 0 \tag{5}$$

$$\frac{d^2y}{dt^2} = -g \tag{6}$$

These two equations can be easily solved and if the initial position (x_0, y_0) and initial velocity (v_{x0}, v_{y0}) are known, then the trajectory of the stone is

$$\begin{cases} x = v_{x0}t + x_0 \\ y = -\frac{1}{2}gt^2 + v_{y0}t + y_0 \end{cases} \tag{7}$$

This trajectory is independent of the mass of the object. This is what Galileo Galilei found in the famous Pisa Tower experiment. Galileo had dropped balls of the same material, but different masses, from the Leaning Tower of Pisa to demonstrate that their time of descent was independent of their mass (Drake, 1978). This was contrary to what Aristotle had taught that heavy objects fall faster than lighter ones, in direct proportion to weight (Sharratt, 1994).

Now if we consider the resistance from the air, the governing equations become:

$$m\frac{d^2x}{dt^2} + k_x \left(\frac{dx}{dt}\right)^2 = 0 \tag{8}$$

$$m\frac{d^2y}{dt^2} - k_y \left(\frac{dy}{dt}\right)^2 + mg = 0 \tag{9}$$

These two equations are obviously nonlinear partial differential equations and no analytical solutions can be found for them but numerical solutions can be easily obtained. For a macro object like a stone, it is well-known that the resistance R is much smaller than the gravity force mg. So the trajectory will not be far away from the solution when the resistance is neglected. However, the actual trajectory will not be mass independent any more since resistance is found to be dependent on the shape, volume of the object together with the density of the air medium (Goldstein, Poole, & Safko, 2002). This case is the typical case where classical mechanics can be used to handle.

Case 2: A coin (statistical mechanics). In the second case, the object is to be a coin which is also a lifeless object. All the psychic forces are zero. However, in this case, the resistance from the air cannot be ignored. Thus, the governing equations are the same as Equation (8) and Equation (9). The solutions can be obtained using numerical method. However, for this problem, if we further consider the object to be a three-dimensional solid body rather than a particle and we are interested in whether the head or tail is up when it falls to the ground, then there are six second-order three-dimensional governing equations, three translational motions for the center of mass and three rotational motions along the principal axes of the object. The detailed equations can be easily found in many textbooks of classical mechanics (e.g., Goldstein, Poole, & Safko, 2002). Furthermore, the initial conditions are hardly to be controlled if it is thrown by a person. If a specific machine is designed to throw the coin, the initial condition might be controlled. For a given initial condition, it will correspond to a particular trajectory guided by the Newton's law and since there are many possibilities of initial conditions, there are many possibilities of the actual trajectory. Thus, probability theory should be combined with the classical mechanics to derive the statistical characteristics of the trajectory for this object and this is the well-known statistical mechanics (Walecka, 2011). In physics, statistical mechanics was first developed to handle large assemblies of microscopic entities using statistical methods and probability theory. It does not assume or postulate any further natural laws except that adopted in the classical mechanics, but explains the macroscopic behavior of nature from the behavior of such ensembles.

Case 3: A cat (new general system theory). Now if the object is changed to be a cat, we will find that the problem is much more complicated than the case that we want to predict the head or tail up for the coin. During a fall from a high place, a cat can reflexively twist its body and right itself using its acute sense of balance and its flexibility (Diamond, 1988). This is known as the cat's "righting reflex". The minimum height required for this to occur in most cats (safely) would be around 0.90 m (Hill, 2012). In many cases, it has been observed that after having reached terminal velocity, cats would orient their limbs horizontally such that their body hits the ground first on all four claws. A 1987 study speculated that this is done after falling five stories to ensure the cat reaches a terminal velocity by thereafter relaxing and spreading their bodies to increased rag. This phenomenon has a specific name of High-Rise Syndrome (ASPCA, 2022).

Why the cats have remarkable ability to survive falls from great heights is an interesting problem and it has been attracted many attentions from the scientific community. Up to now, all the explanations are not so satisfactory but using our new general system theory, this ability can be attributed to the functions of psychic forces. The mind of the cat has the ability to control the movement of the body. Furthermore, if the cat belongs to someone and they have already developed some language to understand each other, in the falling process, the cat's master can also instruct the cat how to adjust its body in order to have less harm. That is, the information from outside of the object can also influence the response of the object. If the cat is dead, this influence will not exist.

Case 4: A person (new general system theory). Now if the object is changed to be a person, the problem will become even more complicated than a cat. For a non-trained person, if he is in panic, he will fall down randomly but for a calm person, he will certainly try his best to reduce the harm to his body similar as a cat does. For a clam person, he may also be able to follow from an instructor how to adjust his attitude to reduce the harm. For a well-trained person, the damage effect may be much smaller in comparing with an ordinary person falling from the same height. All these potentials can be explained with our psychic force model just based on the classical mechanics concepts and principles. There is no need to introduce new postulates as done

in quantum mechanics and relativity theory. Furthermore, even in the current quantum mechanics and relativity theory, the effect of information on the behaviour of living creature is hard to be explained while in our NGST, this can be easily explained by the entanglement of minds. If a person is trained to decompose his body instantly and then assemble his body instantly, he may not harm his body no matter how tall is thrown by other person. This potential could be much powerful than a cat. In the Tibetan Buddhist literature, there are reports that some monks could achieve such kind of capability and this is known as rainbow body phenomenon, the dissolution of the physical body at death (Dalai Lama, 2004; Norbu, 2012). The rainbow body phenomenon is a topic which has been treated fairly seriously in Tibet for centuries past and into the modern era (Ray, 2001; Nyoshul Khenpo, 2005; Rangdrol & Matthieu, 2001; Norbu, 1988; Sogyal Rinpoche, 1993; Reynolds, 1996; Wangyal Rinpoche, 2002). Other Vajrayana teachings also mention rainbow body phenomena (Blackman, 1997; Holland, 2002). Exceptional practitioners are held to realize a higher type of rainbow body without dying. Having completed the four visions before death, the individual focuses on the lights that surround the fingers. His or her physical body self-liberates into a non-material body of light with the ability to exist and abide wherever and whenever as pointed by one's compassion (Rangdrol & Matthieu, 2001).

Case 5: An electron (quantum mechanics). Now we assume that Bob uses a special gun to emit an electron and it is in movement under the joint actions of psychic force, gravitational force, electromagnetic force, resistant force. In NGST, all the microparticles from molecules to quarks and even unobservable particles in the ensemble of ether are interpreted as living bodies. Of course, this psychic force is not as volatile as living creatures. There are many possibilities of the electron trajectory and the statistical characteristics of the ensemble may follow the two governing equations given in Bohmian mechanics (Oriols & Mompart, 2019). Furthermore, in the observation of the trajectory of the electron, photons are emitted and collide with this electron and they will cause some disturbance to the velocity and momentum of the electron. This is the so-called measurement problem while in the previous four cases, the same measurement process exists but due to its small influence, neglect of this influence is acceptable while in this case, the influence is quite large and must be considered. With that interpretation no Heisenberg's uncertainty principle is needed. If we can develop some other measurement methods in the future to record the trajectory of the electron with neglectable influence similar as previous four cases, then the trajectory of the electron can also be accurately measured and the measurement problem is resolved. Recently, some experimental evidences for this speculation were found (Minev, 2018; Minev et al., 2019). So Heisenberg's uncertainty principle is just an emphasis of the measurement error and it can be viewed as a special case of our general uncertainty principle. The actual general uncertainty principle is the relativity of knowledge, that is, "if a human being wants to know something clearly, he needs to attribute all the uncertainty to something else such as the complement of that thing" (Cui, 2021a, p. 249).

If the particle has mass and charge, the movement involves the change of kinetic energy, potential energy, electric energy, and magnetic energy together with the work done by psychic forces. With the three conservation laws of mass, momentum, and energy, the trajectory of the electron can be determined uniquely and if the initial positions and velocities are random, then the trajectory is also random and we can use statistical mechanics to calculate the trajectory of the electron. The existence of the trajectory of an electron can easily be observed in the atomic model that electrons travel in defined circular orbits around the nucleus. The orbits are labeled by an integer, the quantum number n. Electrons can jump from one orbit to another by emitting or absorbing photons (Bohr, 1934).

From particle physics we know that many particles have very short lives. For example, the mean lifetime of an electron is greater than 6.6×10^{28} years while the mean lifetime of a Z boson is only of 10^{-25} seconds (https://en.wikipedia.org/wiki/Particle_decay). The extremely short lives of some particles are called particle decay which is the spontaneous process of one unstable subatomic particle transforming into multiple other particles. The particles created in this process must each be less massive than the original, although the total invariant mass of the system must be conserved. In our new ontology, the active movement ability of particles is attributed to mind-body interactions and thus, each particle has a mind although this mind may be very different from minds in plants, animals, and human beings. The decay phenomena can also be understood as a similar phenomenon of "rainbow body". With this new mind-ether ontology, the wave-particle duality can easily be explained which is similar as that given in Bohmian mechanics (Oriols & Mompart, 2019). This is in compatible with classical mechanics. The spin of a particle is similar as the Stellar rotation of a star and this movement can only be attributed to psychic forces since the other four types of forces cannot induce such a movement.

Further Discussions

From above discussions, one can see that just using a simple problem of one person throwing an object from a high location, another Pisa Tower thought experiment, different mechanics theories such as deterministic classical mechanics, probabilistic statistical mechanics, and probabilistic quantum mechanics have to be applied. Currently, the classical mechanics is in harmony with statistical mechanics but in great conflict with orthodox quantum mechanics. Furthermore, when the object is a living creature such as a cat or a person, both classical mechanics and quantum mechanics are impossible to handle. By replacing the original materialist ontology for classical mechanics with mind-ether ontology, we find that by just applying the classical mechanics together with probability theory, we can explain all the five cases. These five cases are specifically selected. The stone is the object to be well treated by Newtonian mechanics and this object is at rest in relation to our human beings. If another external force is applied to the stone, it will move according to the Newton's laws. If the stone is enlarged to be a star like the moon, this object is moving with internal force in relation to us. When the stone is machined to be a size of a coin, it is still at rest in relation to us without external force. When one throws the coin, its initial position and velocity are hardly to be controlled; thus probability theory should be used in combination with the classical mechanics principles. This is the so-called statistical mechanics. When the coin is thrown under a well-designed machine, its initial position and velocity may be well controlled and the problem can also be treated with deterministic mechanics. When the coin is shrunk to the size of a molecule, an atom, or even an electron, it is moving with internal force in relation to us and even with a well-designed machine, its initial position and velocity are hardly to be controlled, and furthermore, the influence from many other factors such as the observers and the apparatus will become more significant and non-negligible, so statistical mechanics should be adopted. However, as technical progress is made, our control ability to the movement of micro particles such as a molecule, an atom, and even an electron can be upgraded and one day this problem can also be handled by deterministic mechanics. From this deduction process one can see that it is not the size that matters but whether it has the ability to move under the internal force. For the living creatures such as a person or a cat, it is well known that he can move in the living state but cannot move in the dead state, so with a concept of mind, this difference can easily be explained. Based on the induction we generalize this new mind-ether model to micro particles and macro stars and define any object

which can move with internal force in relation to us have a corresponding mind. The structure of an object can be organized in different hierarchical levels and different levels correspond to different minds. For example, for a stone, in this macroscopic level, we can say it is a lifeless object and it does not have a mind. The stone is made of many atoms and each atom is moving all the time, so every atom has a corresponding mind. Same can be used to explain a person, both in living state or dead state. With this new ontology, more potentials for a human being to be reached by training can be expected. In order for readers to understand this ontology and the new general system theory, some further discussions are provided in this section.

First, the whole universe is an interrelated system. If we want to distinguish different objects within this system, at least a pair of concepts which can cover the whole domain must be used. The existence of one object or item depends on the existence of the other. For example, me and the environment, which is called nature before Newton's time. That is, two-valued logic system is the minimum of the logical system. This pair of mutually excluded and fully complemented concepts will always co-exist. It is not one creating the other like God creating the world (theism), matter creating the mind (materialism), or mind creating matter (idealism). In order to define concepts, life (me) must exist before hand and the same is for nature. If we want to ask whether the nature occurred earlier than life or life occurred earlier than the nature, this is basically "the chicken or the egg causality dilemma". No scientific theory can explain the origins of the universe and the life; we have to assume the pre-existence of the universe which consists of many lives and lifeless objects (Bunge, 2010, p. 275). Otherwise, we have to introduce some counter-intuitive concepts such as God, Big-Bang, and various self-abilities such as self-organization or autopoiesis (Maturana & Varela, 1980). By assuming the pre-existent and existent forever universe, we can explain the origin of a particular world and the origin of the living creature in that world. For example, under the pre-existence of the universe, we can easily explain the origin of the earth and the origin of the lives on the earth. The present life science theories can be revised based on this new mind-ether ontology.

Second, everything we can describe is relative to us and its nature to us whether it is objective or subjective and whether the process is reversible or irreversible are under certain conditions. For example, movement is relative to us if we assume we are at rest. However, we can never know the actual movement of our own platform similar as we cannot know the origin of the universe (Pan & Cui, 2021b). These two conclusions are drawn based on the famous Gödel's incompleteness theorems (Gödel, 1931). Even the knowledge itself is a relative knowledge and we have ignored the influence of other objects in the universe to the system we study. Fundamentally speaking the scientific method we are using to understand the world is "a blind man feeling an elephant" or "looking at the sky from the bottom of a well". Due to the limited ability of human beings who can only observe a finite spacetime, uncertainty about the whole universe is irreducible. If we want to know something, we have to attribute the uncertainty to its complement. Thus, in every scientific theory, some fundamental existences which are used to carry this irreducible uncertainty have to be used. If we choose only one item, it will either have the creator problem in the cases of theism and materialism or have the creating something from nothing problem in the cases of idealism and Big-Bang. So the dualism such as mind-ether is a necessity and otherwise arbitrary fundamental existences such as energy, information, dark matter, dark energy have to be introduced at a later stage when we meet new phenomena.

Third, for creating a theory, for the same set of observed phenomena, different theories can be developed based on different fundamental assumptions. Co-existence of the orthodox quantum mechanics and Bohmian

mechanics, the great success of the relativity theory are two typical examples. So our NGST based on the mind-ether ontology and harmonious deterministic-probabilistic epistemology is another attempt towards the unification of different theories with the final target to construct a theory of everything (TOE) (Kang & Cui, 2020). It is our belief that causality law is a universal law similar as conservation laws. Everything we can observe is operated with laws and we do not know the laws at the moment is just due to the lack of information rather than the indication that there are no laws. So we should stick to the generalization of classical mechanics which are based on these beliefs rather than giving up the classical mechanics and creating a totally new mechanics such as relativity theory and orthodox quantum mechanics. In our NGST theory (Cui, 2021a; 2021b), the wave-particle duality is explained by adopting Louis de Broglie and David Bohm's "Wave and Particle" explanation rather than Bohr's "Wave or Particle?" explanation (Oriols & Mompart, 2019); the measurement problem is explained as measurement errors induced both from observers and apparatus (Kang & Cui, 2020); the quantum entanglement is interpreted as the entanglement of two minds rather than two bodies (Kang & Cui, 2020). The blackbody radiation and photoelectric effect are due to the emission or absorption of unobservable material particles, that is the main reason why the energy is discrete. The exchange of heat will always involve the exchange of matter since heat is a special type of energy and energy is a property of matter. It needs the carrier of matter to store the energy (Pan & Cui, 2022). The Maxwell's demon can be explained through the work done by the demon which is a living creature. There is no violation of energy balance principle. The Schrödinger's cat can only be either in a living state or a dead state and its knowledge can only be obtained through measurement. If we open the box, we can have this knowledge and if we do not open the box, we do not know. To place a radioactive source in a sealed box is just to increase the complexity of the problem but it does not change the nature of the problem that the cat is in a deterministic state. Every micro particle such as an electron is in the same situation. It is in the state of a particle but its actual trajectory may be only known probabilistically in a wave surface. Thus, it is really unnecessary to claim the non-existence of the trajectory for micro particles and the random nature of mutation. Recently counter examples have occurred against these two claims (Minev, 2018; Minev et al., 2019; Monroe et al., 2022).

Fourth, the key issue for the validity of NGST is to prove the existence of psychic force and to provide the measurement method how to measure the psychic force. For the first problem, many evidences have showed the existence of psychic force for human beings (e.g., Cardeña, 2018; Moreira-Almeida & Santana Santos, 2012) but how to extend to animals such as the cat should be the next step. For the second problem, we may backstep to calculate the psychic force based on the measurement of stellar movement or micro particle movement using NGST, the generalized version of classical mechanics. They are non-living minds and their mind-body interactions are simpler than living minds such as animals and human beings. After that people may use this model to study the behaviour of plants. For human beings, the mind-body interaction may be studied through meditation which has already been practiced for thousands of years (Dalai Lama, 2004).

Summary and Conclusions

In this paper, a simple problem of one person throwing an object from a high location, another Pisa Tower thought experiment, was carried out. Five different objects of a stone, a coin, a cat, a person, and an electron are specifically selected for analysis. Traditionally, the first case is suitable for classical mechanics; the second case is suitable for statistical mechanics while the fifth case is for quantum mechanics. For Case 3 and Case 4, no

suitable mechanics theory exists. However, it has been demonstrated that the NGST is able to handle all the five cases. Through this demonstration, it can be concluded that it is not the scale that matters but the living nature whether the object is lifeless or living. By using the psychic force introduced in NGST, the classical mechanics has provided adequate room to explain the various newly observed phenomena for orthodox quantum mechanics and relativity theory and for human beings various parapsychological phenomena can also be explained by classical mechanics. Therefore, it is concluded that generalization of classical mechanics is adequate and no need to develop revolutionary quantum mechanics and relativity theory.

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