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Towards A Quantum Mechanical Model of Foreign Policy Analysis

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Abstract

The bid to fully understand varied actors' choices in international politics has over the years led to efforts aimed at providing a theoretical framework that best analyses foreign policy. Such efforts culminated in the skillful forgery and application of a pool of theories and approaches that claim relevance in opening the blackbox of policy making. However, no theory has since been consensually accepted to possess a general explanatory power for the foreign policy actions of all state and non-state actors across time and places. These theories, often regarded as orthodox and heterodox approaches to foreign policy analysis, are shown to be infected by serious shortcomings of inconsistencies and inadequacies similar to the problems of classical physics. They are therefore taken to be consistent with Newtonian mechanics of the physical sciences. Considering that classical mechanics tend to have given way to quantum mechanics in the explanation of physical reality, the mechanistic thought of quantum physics is herein adopted as a useful tool for foreign policy analysis. This study is a new trend in foreign policy analysis, a trans-disciplinary thinking which attempts to blend the study of international politics with some aspects of the physical sciences.

Keywords: Newtonianism, Quantum, Foreign Policy, uncertainty, simplicity, bivalence, interconnectivity.

Introduction

The bid to fully understand varied actors' choices in international politics has over the years led to efforts aimed at providing a theoretical framework that best analyses foreign policy. Prior to the end of the Cold War, a number of IR theories had been instrumental for foreign policy analysis. Notable among orthodox approaches chiefly include realism and liberal idealism. However, the unprecedented end of the Cold War and the manifest inability of IR theories to predict this sudden change in global politics, undermined the explanatory pretensions of existing theories.[1] It therefore became apparent that our inherited tools and ways of describing the international arena would no longer work as well as they once did.[2] The resultant effect was a revived quest for a more suitable theoretical framework for foreign policy analysis, thus eventuating in the springing up of several heterodox approaches.

This paper is guided by three main objectives. First it hopes to contribute to the on-going quest for a theoretical tool for foreign policy analysis. Secondly, it seeks to identify a vital relationship between the physical sciences and the field of International Relations as a broad discipline. Thirdly, the study presents quantum mechanics as an appropriate tool for foreign policy analysis.

Quantum mechanics emerged in the 20th Century as an alternative tool for understanding the physical world. It was particularly accepted by a wide range of scientists for its exactitude and attention to detail. It was also adopted by other platforms beyond the physical sciences as its chief arguments were applied to such distinct disciplines as sociology, economics, theology and philosophy. It is therefore hoped that applying the quantum mechanical thought to foreign policy analysis would meaningfully address the controversies that have continued to plague the search for an all-encompassing theory for foreign policy analysis.

The study is structured in the following manner. The first section attempts to reveal the elements of classical mechanism in the existing approaches to foreign policy analysis. In the second section, quantum mechanics in relation to its emergence and intellectual sources would be discussed. The third section presents an overview of the chief postulations of quantum mechanism. The fourth section will try to rationalize the relationship between quantum mechanics and foreign policy analysis. The fifth and final section would be summary and conclusion.

Newtonianism in Foreign Policy Analysis

In the course of the 18th Century, Sir Isaac Newton formulated a system of physics now regarded as 'Newtonian' or in a broader sense, 'Classical' mechanics'. Based on his laws of motion and gravitation, he presented a description of the world as a machine operating on certain given laws. These laws are precise, mechanical and universal in nature, and as such provide a framework upon which an accurate understanding of the physical world could be achieved.[3] Newton perceived of a world so 'nicely' organized that with adequate knowledge of initial conditions, one could precisely understand the present and correctly predict the future. The world in this perspective therefore possessed all the trappings of a rational machine as it was "programmable, controllable and engineerable."[4]

Accepting Newton's claims, subsequent physicists prior to the 20th Century, modelled their inquiries in line with Newton's worldview. This was as contained in his three laws of motion, that:

(i) Every body perseveres in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by forces impressed thereon
(ii) The alteration of motion is ever proportional to the motive force impressed; and is made in the direction
(iii) To every action there is always opposed an equal reaction; or the mutual actions of 2 bodies upon each other are always equal, and directed to contrary.[5]

The chief philosophical implication of these laws is the principle of cause and effect. This holds that for any natural event, there must have been a direct and identifiable trigger. It is also suggestive that the same cause must be assigned to natural events of the same kind irrespective of distance and time. It was therefore on this note that Newton argued that the universe operated in a harmonious order. He furthered that if order was not readily apparent, it was therefore as a result of the limitations of man and not the lack of order.[6] Hall aptly captures Newton's argument when he wrote:

> Nothing happens by chance, nothing is arbitrary, nothing is *sui generis* or law unto itself. The philosophy of both *Principia* and *Optics* insists that however varied, disconnected, and specific the almost infinite range of events in nature may seem to be, it is so in appearance only: for in reality all the phenomena of things and all their properties must be traceable to small set of fundamental laws of nature, and by mathematical reasoning each of them is deducible again from these laws, once they are known.[7]

Newton and other proponents of classical mechanics attempted to create the world as a well-oiled machine designed by bright engineers. The failure of one design could therefore, in their argument, be resolved by simply looking for another design. They placed knowledge in binary categories, where wave and particle existed as separate entities.[8] The Newtonian arguments appealed to his age in so much that it was soon adopted by many other fields. People no longer believed in the existence of a deity that controlled the affairs of men. Rather, they emphasized that the universe was governed by a set of natural laws which granted natural rights and natural liberties. Adam Smith for instance drew from Newton's laws when he postulated the law of demand and supply. In the same vein, Gregor Mendel suggested that inherited traits affected species development. Darwin and Spencer argued that natural selection was the determining mechanism of evolution. Thus, Newtonianism had influenced human understanding of world events. This new understanding soon culminated in the Scientific Revolution, the Age of Enlightenment as well as the Age of Reason. By 1789, eighteen editions of Newton's *Principia* had been published, with wide circulation across Europe.[8] It is unsurprising therefore that the same year witnessed the beginning of the 18th Century French Revolution.

Since the beginning of the study of International Relations and by extension, foreign policy analysis, scholars have tended to adopt certain basic concepts of Newtonianism. These include: simplicity, bivalency, and linearity. These few are selected because it is impossible to show in a single paper, all assumptions of Newtonian mechanics in relation to their application to foreign policy analysis.

Newton extended the principle of simplicity in the sciences to the realm of philosophy. In his first rule of philosophizing as contained in the *Principia*, he maintained that "we are to admit no more causes of natural things than such are both true and sufficient to explain their appearances."[9] He added that nature was simple, and does not luxuriate in superfluous causes of things. This view was also shared by Einstein who once claimed that the basis of all scientific work is the conviction that the world is "an ordered comprehensible entity" based on "sense experience."[10] Thus, classical mechanics was anchored on the use of common sense notions to describe the existence of matter and forces, assuming that both have definite and identifiable properties.

Some approaches to foreign policy analysis evidently took after the Newtonian first rule of philosophizing – simplicity. The problem associated with this approach to foreign policy analysis is its reckless abandon of abiding complexities in the international system. The realist approach for instance, argues that in order to ensure survival, States will seek to maximize their power relative to others.[11] This argument ignores the complex nature of the international system, where the maximization of State power does not always ensure the survival of the State. Adigbuo addresses this abysmal flaw in realist paradigm when he suggested that "realism's disregard for the material and social costs that some of its policy prescriptions seem to impose on the structurally developing Nigerian state is worrisome." [12]

In addition, the realist approach to foreign policy analysis claims that every action on the world stage can be explained as struggles between states to secure their frequently conflicting national interests.[13] Again, this approach aligns with Newtonian simplicity in its failure to acknowledge that the national interest of States are not always conflicting. Also, realism argues that states are the only actors in international politics. The problem with such an assumption is that it utterly neglects the rise of non-State actors as major players of international politics. Instructive to note as examples of non-State players that have crowded the international political stage include such terrorist organizations as al-Qaeda, al-Shabaab, ISIS, Boko Haram as well as some charity-based non-governmental organizations such as the Bill and Melinda Gates Foundation, among others.

In the same vein, liberal-idealism like realism, fails to pay adequate attention to the complexity of the international system. This is owing to the fact that liberal idealist theorists attach so much emphasis on free market, believing the same to be a sine qua non for democracy, peace and development. The error in such a theoretical postulation is underscored by the failure of free market prescriptions to transform Third World countries, especially within Africa. Liberalists also 'simplistically' assume that democratic states would be more peaceful than authoritarian states. Such assumption is based on common sense and has no correlation with reality.

Constructivism, on the other hand, also tends to adopt the simplistic approach of classical mechanics. This is in its common-sense assumption that a global consensus can be reached, not just on normative principles, but also on when and how they should be applied.[14] The theory also submits that identity is a means of shared values. Such an argument is void of credibility when applied to special case multi-ethnic states like Nigeria whose citizenry rather derive their identities from respective tribal cleavages, than an artificially created state identity.

Role theory as an approach to foreign policy analysis attempts to catalogue roles and their effects on the foreign policy behaviour of states. By ascribing roles, emphasis is placed on social conformity while human agency is largely misplaced.[15] It is on this note therefore that role theory apparently adopts the Newtonian principle of simplicity.

In furtherance to the foregoing, it should be noted that Newtonian mechanics also engages the principle of bivalence in its description of physical reality. Bivalence is a principle in logic that states that every declarative sentence is either true or false. In Newtonian physics, the principle of bivalence is used to explain that an object is either a particle or a wave. This principle is also known as the principle of 'either-or'.[16] It attempts to understand reality in a mechanical binary format. An example of this argument can be deduced from Schrödinger's Cat where an animal is believed in classical physics to be either dead or alive. To Newtonians, this was part of the universal laws which explained reality.

By extension, the principle of bivalence is evident in some mainstream theories of foreign policy analysis. For instance, Realism assumes that states are either weak or strong in the international system. This realist assumption negates the fact that a state could be economically weak and at the same time politically strong, as was seen in the defunct Soviet Union. It also fails to acknowledge the fact that a state may be classified as 'strong' within its sub-region but regarded as 'weak' at the global stage. More so, the realist approach explicitly categorizes states into a band of opposing camps – allies and enemies. This binary portrayal of states however fails to acknowledge that states could be co-operative on an issue and at the same time share conflicting interests on another.

Marxism/Leninism also attempts to view states from a binary lens. This is found in its penchant to categorizing states as either capitalist or socialist. The Marxist/Leninist approach to foreign policy analysis also borrows the leaf of linearity from Newtonian mechanics. Karl Marx offered a theory of historical development which suggested a relatively linear progression through different stages of mode of production eventuating in the Utopia of communism.[17] The inadequacy of the Marxist assumption is sufficiently underlined by the collapse of the USSR in 1991 and the scholarly analysis that followed. Role theory also apparently views global politics from a binary lens. This is in its categorization of roles into Cooperation (+) and Conflict (-).[18]

The foregoing shows the relationship that exists between Newtonian mechanics and approaches to foreign policy analysis. It is however surprising that when physicists began to drift away from Newtonian mechanical description of reality, foreign policy analysts rather continued to develop approaches to reanimate elements of Newtonianism. Quantum mechanics, with its success and accuracy in describing reality is here suggested as a useful for foreign policy analysis, considering its metaphorical and methodological implications.

Quantum Mechanics: Emergence and Intellectual Sources

Quantum mechanics is a 20th Century development in the physical sciences that proffered entirely new approaches towards the understanding of the physical world as distinct from the already established classical approach (mechanics). The word "Quantum" is derived from a Latin term meaning "how much".[19] Deriving from its etymology therefore, Quantum Mechanics upholds that nature is made up of bits and pieces; it therefore delves into studying these bits and pieces that make up nature. Its origin is traced to December 14, 1900, with the postulation of Planck's Black Body Theory. It was however not until 1924 that the phrase was first coined by Max Born. Unlike the classical mechanics, quantum mechanics was neither created by an individual, a group of individuals, nor through a strictly logical way.[20] Rather, it eventuated from a number of guesses inspired by profound physical insight and a thorough command of new mathematical methods.[21] The inability of classical physics to answer certain pertinent questions of the day about physical reality also inspired the development of quantum mechanics.

The first 'guess' that inspired the formulation of quantum mechanical thought was forwarded by Max Planck in 1900. Planck hypothesized that vibrating electrons in incandescent lights could only have energies restricted to certain values. As a result, radiation was emitted in quantized energy.[22] With this submission known as the Black Body Theory, Planck resolved a major challenge of theoretical physics to derive an expression for the spectrum of the electromagnetic energy emitted by an object in thermal equilibrium at some temperature.[23] He, therewith, laid the foundation for quantum mechanics. Planck's discovery was followed in 1905 by Albert Einstein's discovery of light-quanta.[24] This was developed into the law of "Photoelectric Effect" which violated classical assumption about the wave-like behaviour of light. The impact of Einstein's discovery on the development of quantum mechanics is so remarkable that some physicists regard him as the 'true father' of Quantum Mechanics even when he failed to agree with some of the major arguments of the quantum mechanistic thought.[25]

The next important contribution to quantum mechanics came in 1913 with the work of Niels Bohr who extended the notion of quantization of energy to the hydrogen atom.[26] He was the first to present an indication of the size of atoms using the rules of quantum mechanics. Bohr was followed by Louis Victor de Broglie who suggested in 1923 that just as light waves sometimes exhibit particle characteristics, it turns out that massive particles also sometimes exhibit wave-like properties.[27]

Another milestone in the development of quantum mechanism was the 1925 contribution of Werner Heisenberg who "not only developed the Uncertainty Principle, but was the principal architect of Matrix Mechanics, one of the two standard formulations of quantum mechanics.[28] His theories upturned key assumptions of classical physicists and have continued to serve as the ground for quantum electrodynamics and for modern quantum field theory. It is worthy of note that Heisenberg had collaborated with other great physicists to develop the Matrix Mechanics. These were Max Born and Ernst Jordan.

Max Born's contribution to quantum mechanics is also spotted in his attempt to further Broglie's hypothesis that particles are in some sense associated with waves. He proposed that these waves are abstract and nonphysical. He therefore attempted to explain wavelenghth, however, without giving details of the waves.[29] It was therefore on this note that Schrodinger developed an equation to determine the wave properties of a particle as well as the wave behaviour of the electron in hydrogen atom. Schrodinger also showed that wave mechanics and matrix mechanics were different mathematical versions of quantum.

Another leading figure in the development of quantum mechanics was Paul Dirac who in 1925, developed his own version of quantum mechanics called 'number algebra'. Thereafter a large number of physicists had continued to dig into the breadth of quantum mechanics. It is however instructive to note that despite its far reaching achievements, quantum mechanics is yet to be adequately understood.[30] What is obtainable is that certain key postulations of quantum mechanics have been achieved. The next subsection therefore attempts to discuss some key postulations of Quantum Mechanics deemed relevant in foreign policy analysis (FPA).

Some Chief Arguments in Quantum Mechanics

Richard Feynman, a renowned practitioner of Quantum Mechanics, is quoted to have remarked, "I think I can safely say that nobody understands quantum mechanics."[31] This semantic difficulty stems from the fact that quantum mechanics radically differs from traditional scientific theory and method.[32] It rather presents an understanding of physical reality from entirely different perspectives. For instance, it shatters the nicely organised world of classical physics by arguing that the physical world is a "coarse, grainy place rather than the smooth continuous place with which we are familiar."[33] This description therefore presents the world as a blurred image of the grainy world of atoms. Thus, rising from the worldview of quantum mechanics, certain key arguments can be noted.

Among the most basic postulations of quantum mechanics is the principle of uncertainty. Uncertainty here holds that there is a fundamental limit to the precision with which certain pairs of physical properties of particle can be known at the same time. Werner Heisenberg, one of the chief proponents of the principle, submits that the position and momentum as well as the energy and time of a particle can never be determined simultaneously.[34] He therefore postulated that two canonically conjugate observables cannot be measured with accuracy at the same time.[35] It is based on a discovery that exactly where an individual photon, after passing through a slit, will hit a photographic plate cannot be predicted.[36] This, in his argument, introduces an unavoidable uncertainty.

Uncertainty Principle in Quantum Mechanics challenges the classical assumption that with adequate understanding of initial conditions, even the future can be predicted. Ever since its introduction into the world of theoretical physics, Uncertainty Principle has received immense scholarly attention and has assumed a philosophical note known as the Principle of Indeterminacy.

Erwin Schrodinger in some sense furthered the uncertainty argument of Heisenberg. This was with his submission that even if the wave function is known precisely, the result of a specific measurement on the wave function is uncertain. With his cat experiment, he showed that since we cannot tell exactly when a particular radium atom will decay, it therefore means we are uncertain of its physical state.[37] Thus, to palliate this limitation in measurement; the concept of superposition was introduced. With superposition, Schrodinger argued that until an object is observed, its state cannot be determined. He however added that observation itself affects an outcome which did not exist until observation was made.

Niels Bohr gave his own separate interpretation of the principle of uncertainty in quantum mechanics. He submitted that uncertainty is first and foremost an expression of complementarity. He maintained that it would be impossible to achieve a sharp separation between the behaviour of a system and its interaction with the measuring instrument.[38] By way of interpretation, this means that the tools and/or perspective of the observer interferes with the result of the observation. According to Bohr, "We must, in general, be prepared to accept the fact that a complete elucidation of one and the same object may require diverse points of view which defy a unique description."[39]

Also, Quantum Mechanics postulates that causation is too complex and too interconnected to be monitored.[40] Among its diverse explanations for causation is the notion of entanglement. It holds that when two or more particles are entangled, they can exhibit striking correlation in their behaviours without necessarily communicating with each other. They (entangled particles) have direct influence on each other, even at a distance.[41] Despite stiff opposition from Einstein and other renowned physicists, the notion of Quantum entanglement has been repeatedly proven, giving room to the development of Quantum teleportation.

Drawing from the foregoing, Quantum Mechanics can be summed into four main dimensions: uncertainty, improbability, interconnectedness as well as the lack of objective reality.[42] Uncertainty concerns itself with our inability to completely understand a phenomenon with absolute exactitude while improbability has to do with our inability to predict an outcome despite our knowledge of initial conditions. In the same vein, quantum mechanics informs us of an interconnected world where it is impossible to adequately understand a system by dividing it into discrete parts. Finally, with the effect of observation on outcome, Quantum Mechanics underlines the impossibility of arriving at an objective reality. It maintains that what is observed is a creation of the observer. Thus, with an understanding of quantum mechanics, this study would proceed to ascertain the applicability of quantum mechanics to foreign policy analysis.

Foreign Policy Analysis: Towards a Quantum Mechanical Model

Earlier in this paper, the influence of Newtonian mechanistic thought on the formulation of approaches to foreign policy analysis was examined. As seen, Newtonianism provided a paradigmatic blueprint upon which distinct theories of foreign policy analysis were formulated. However, it is interesting to note that since the past century, physical scientists had formulated quantum mechanics to address the inadequacies of Newtonianism. Does this therefore not signal the need for a paradigm shift among foreign policy analysts? Have the Newtonian approaches provided adequate explanations for the complex and indeterminate nature of contemporary world politics considering that there is no longer a stable and predictable system in the international arena? [43] It is therefore pertinent to look again at the physical sciences, owners of the Newtonian model, in search of a state-of-the-art lens through which reality can be viewed. It is on this note that the Quantum Mechanical Model becomes fitting.

This study does not advance Quantum Mechanics as a substitute to mainstream approaches to foreign policy analysis or IR theories; rather, it suggests an adjustment of already existing theories and approaches in order to suit a contemporary understanding of reality. Quantum mechanics does not favour a theory or an approach over another. Instead, it underscores the need to understand foreign policy behaviour from the lenses of all existing approaches and even more, without ignoring the inherent defects in each of the approaches.

Uncertainty, as noted earlier, is one of the key features of quantum mechanics. It holds that no matter how carefully we observe, even with adequate knowledge of initial conditions, we can never objectively understand a physical reality. Applying the concept to politics, Cioffi-Revilla defines uncertainty as the "lack of sureness or absence of strict determination in political life"[44] Rathbun furthers that "information is ambiguous because the world is complex and can only be approximated and partially understood due to cognitive limitations."[45] He therefore sought to explain the element of uncertainty within mainstream IR theories. For realists, it is experienced in fear of each other's intention, while rationalists try to cope with uncertainty through international institutions charged to monitor and signal benign intent. For constructivists, uncertainty stems from an assumption that states are uncertain about action to take when norms as defined by identity are absent. Then cognitivists argue that uncertainty emanates from the confusion caused by the complexity of international politics as well as mental limitations of statesmen.[46]

Assessing uncertainty from the quantum mechanical framework, we begin with Heisenberg who is arguably the first to introduce the principle. From his perspective, we cannot completely describe an object since we cannot simultaneously describe its momentum and position with exactitude. The more accurately we understand position, the less accurately we understand the momentum, vice versa. As such, it becomes impossible to predict the destination of a moving object since we cannot accurately determine its position and momentum at the same time. From quantum mechanical thought, this is may be due to hidden variables and/or non-locality. Non-locality describes the possibility of a quantum state to interact with another quantum state of the same pair, even when separated by large distances without an established means of communication.

By position we refer to the location of an object relative to a reference point while momentum is taken to mean the measure of the motion of an object relative to its mass and velocity. Position in theoretical physics is synonymous with the condition of a State prior to an action or event being analysed. By condition we mean the geographic and politico-economic structure of a State. In the same vein, the foreign policy action of a State in a given case, accounts for momentum in physics. Therefore, by directly applying Heisenberg's argument to foreign policy analysis, it is impossible to completely understand foreign policy behaviour of a State by merely understanding its condition prior to the behaviour being analysed. Also, it is impossible to predict the outcome of a given foreign policy behaviour. This explains why despite efforts to predict the outcome of a given foreign policy behaviour, mainstream approaches to foreign policy analysis have routinely fallen short in this regard.

A good example showing the compatibility of Heisenberg's uncertainty in foreign policy analysis could be found in the recent Arab Spring. An understanding of the socio-political landscape of the Arab world had led scholars of different schools to conclude that democracy was essentially incompatible with the Arab world. However, at the outbreak of the region-wide uprising, scholars began to foretell democratization. Soon, scholars began to make reversals in their predictions, such that it is no longer fashionable to equate the Arab uprising with democratization. What is deducible from this instance is that, in agreement with Heisenberg's uncertainty, it is impossible to understand the present and predict the future by simply understanding initial conditions. This position is also understood by recalling that whereas the Cold War engaged IR scholars in a war of paradigms, none of the theories and models predicted the end of the conflict.[47]

Schrodinger's wave equation furthers our understanding of the compatibility of quantum mechanics with foreign policy analysis. Inferring from his postulation, it is impossible to understand the totality of a State's foreign policy behaviour. Rather, every State possesses every possible theoretical element that can be attributed to a State's foreign policy. For instance, before observation is made, every state is weak and strong at the same time; aggressive and accommodating; cooperative and competitive. However, upon observation, the observer interferes with reality such that the condition of the State aligns with the premonition of the observer/analyst. Thus, we are uncertain of a State's foreign policy behaviour until we decide to observe and/or analyse. Upon analysis, our uncertainty is substituted by the 'creation' of reality. It is at this point therefore that the foreign policy analyst relinquishes every claim to objectivity, having created the reality s/he claims to analyse.

Relating the foregoing to Bohr's contribution to Quantum Mechanics, the foreign policy analyst can no longer be regarded as an impartial observer but as an active participant. The instrument with which s/he assesses a phenomenon directly interacts with the physical object being observed to influence the result obtained. Consequently, we could safely assume that if no one was observing, then nothing would be existing. Then, should we now assume that occurrences in international politics are the creation of analysts? To a large extent, the answer weighs to the affirmative and accounts for why certain state and non-state actors, cognizant of this fact, have immensely invested towards gaining the attention of observers/analysts. Terrorist organizations routinely post videos of violence on the internet for analysts to 'create' their existence. States regularly release videos and images of military drills and military hardware. The essence is to gain attention of analysts who would therefore 'create' the desired reality. Indeed, terrorism is non-existent until it is so designated by analysts. More so, war is simply what analysts and observers make of it.

In addition to the foregoing, quantum mechanics gives us insight in understanding causation. This is chiefly in its notion of interconnectedness which carries potentially far-reaching implications for foreign policy analysis. According to Senge, et al, we are now aware that interconnectivity is the organizing principle of the universe.[48] The universe is interconnected in a complex web or relationships such that we cannot adequately understand a physical reality without acknowledging its web of relationships. However, this aspect of the universe was ignored by the Newtonian scientists perhaps as a result of the pervasiveness of relationships which can sometimes fade into the background so that "only the apparently separate 'things' of the world are noticed."[49]

If objects are interconnected within the universe, do we then assume same for humans and States? Of course, yes. This is largely because humans as well as States share the same feature with all other objects: wave-particle duality. As particles they have form, boundaries, and identity while as wave, they possess an unstructured potential which, according to Zohar, spreads out across the boundaries of space, time, choice and identity.[50] Therefore, State and non-State actors, as applicable to other objects, are interconnected or better still entangled in a complex manner that makes it particularly tasking if not impossible to accurately assess foreign policy behaviour.

From the foregoing, it could be assumed that quantum mechanics emphasizes what we cannot do over what we can do. How does it then help our understanding of foreign policy? The answer is not far-fetched. By identifying what we cannot do, quantum mechanics saves us from raising false alarms and making erroneous claims. It rather makes case for intellectual diligence by encouraging cross-paradigmatic approach to foreign policy analysis. It underscores that no single theory or approach to foreign policy analysis is on its own adequate for foreign policy analysis. Thus, by engaging all possible approaches, the analyst increases the proportion of objectivity in his/her analysis.

Conclusion

By way of conclusion, quantum mechanics as seen in this study is a useful guide to foreign policy analysis. This study examined some major approaches to foreign policy analysis, pointing out their distinct Newtonian shortcomings. Realism, for instance, is noted to be both simplistic and bivalent. Simplistic on the ground that it does not concern itself with as much details as are necessary but rather confines itself to a stereotype of built on common sense. On the other hand, realism is bivalent in its binary interpretation of international politics. This is contained in the realist assumption that States are either weak or strong, competitive or co-operative. Also, liberal idealism is observed to be simplistic in its exaggerative relevance attached to free market. Constructivism as well exudes Newtonian simplicity in its key assumptions regarding identity and normative principles. Marxism tows the path of Newtonian linearity and bivalence. Marxian linearity is seen in its dialectic progression of history, while bivalent in its categorization of the world as either socialist or capitalist, exploiters or exploited. Role theory which is a renewed theory for foreign policy analysis is, on its part, apparently simplistic in its assumption that social conformity is a chief factor in foreign policy behaviour.

Sprouting from the pitfalls of Newtonianism was the quantum mechanical model which is, in this present study, considered relevant in addressing the shortcomings of mainstream approaches to foreign policy analysis. Uncertainty, improbability and interconnectedness are some vital concepts in quantum mechanics that were assessed as relevant theoretical insight for understanding the foreign policy behaviour of States. Quantum mechanics is a relatively new approach within the social sciences but promises to be a useful tool, not only for the study of foreign policy, but for our understanding of global politics as a whole.

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