THE 'MANY WORLDS INTERPRETATION' THEORY OF QUANTUM PHYSICS AND MEANING EXPLICATION IN A SECOND LANGUAGE CONTEXT

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Abstract

The Many Worlds Interpretation (MWI) theory is an application in quantum mechanics which has been adopted for use in computer programming and technology, physics, mathematics, cosmology, psychology, philosophy, etc. (Tyson 2008). Its benefits to studies in meaning explication remain untapped largely because the interactions between linguistics and the physical sciences have been guarded and thus limited. The aim of this paper therefore was to use the Many Worlds Interpretation theory to explain how an appropriate meaning is constructed by a listener from among myriads of other possible interpretations in an interaction, particularly in a second language situation. Decoherence tools of history, experience and environment were applied to some linguistic samples of sentences, dialogues, metaphors, jokes, cartoons, etc., to elucidate how the appropriate meaning is arrived at. From our analysis, it was found that while speakers are engaged in linguistic interactions, they are usually constructing different 'worlds' from which emerges one that is appropriate to the situation and which exposes the intended meaning. It was also noted that this intended meaning becomes the classical world as a result of perspectivisation. Previous knowledge, enhanced by cultural context, determines largely the content of what is perspectivised. Thus, the paper concludes by proposing that the MWI theory can lead to a *parallel worlds linguistics* approach, a notion that can be very useful in showing how meaning construction in social interactional situations (such as conversations, classrooms, literature, religious affairs, performances, etc.) is enhanced by individual manipulation of cultural choices, particularly in second language situations.

Keywords: classical worlds, decoherence, environment, experience, history, linguistics, many worlds, parallel worlds, perspectivisation, quantum physics, superposition

1. Introduction

The Many Worlds Interpretation (henceforth MWI) theory, also called the Parallel World theory, was introduced by Hugh Everett (who called it the "'Relative State' Formulation of Quantum Mechanics") in the late nineteen-fifties (Tyson 2008, n.p.). MWI is an application in quantum mechanics which has been adopted for use in computer programming and technology, physics, mathematics, cosmology,

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psychology, philosophy, etc. (Tyson 2008, n.p.). Its benefits to studies in the humanities, particularly linguistics, remain untapped largely because the interactions between the humanities and the physical sciences have been guarded and thus limited. Clearly, a closing of the gaps would not only be mutually beneficial but may reveal the many areas of overlap that could lead to a definite statement about the state of man. This paper will in the main attempt to establish the relevance of the MWI theory to linguistic studies.

Studies on language use have moved through several levels. Saussure's langue and parole dichotomy examined language use as mainly group behaviour to which individuals contribute (Lee, 1992); Sapir and Whorf's language relativity and determinism theory examined language as being preconditioned on the group's world view and perceptions (Lee, 1992); Hymes' ethnographic studies attempted to relate a people's cultural perceptions to their language (Saville-Troike, 1982; Wardhaugh, 1998). Lakoff and Johnson's (1980) experiential empiricism is the basis for metaphor comprehension that precludes models and frames based on folk knowledge, including beliefs, norms and mores. Each of the approaches has perceived language to be mainly a product of group culture which portrays traits such as world views and perceptions shared by speakers, thus presupposing a single world

The contribution of the individual to group knowledge has had little attention, yet, it is clear that the experiences that contribute to general knowledge occur at that level. Meaning has been seen as a product of the interactive process among people (Palmer 1996, pp. 11-34). This process recognises that meaning emerges as a product of the performance between interactants who use specific social frames that convey cognitively expressed constructs and objects in the real world. Hence, individual users of language are products of their various categorisation systems, because the constructs of those systems are based on particular experiences and world views. The implication of this is that participants in an exchange can construct a particular meaning from a language interaction on the basis of their own experiences even though other possible interpretations can be envisioned by either. How a particular meaning is selected over and above other possible ones continues to preoccupy linguists.

2. Aims and objectives of the Study

It is safe to surmise that studies in quantum physics or mechanics are

engaged in the attempt to explain the physical world by relating it to the quantum worlds. In so doing, there have been attempts to compute the state of Schrodinger's cat upon observation as it moves around in the box; and through it, to predict the border between the quantum worlds and the observable, classical world. Ultimately, these attempts are collated towards answering the one question still left: why does anyone perceive only one particular state as against many others which are equally possible?

These preoccupations can be related to attempts to understand human linguistic interactions such as conversations, performances, advertisements, speeches, pictures, religion, etc. Myriads of efforts have yet to resolve the one question – what are the factors that determine why an individual arrives at a particular meaning, and not another, from an interaction?

The main aim of this study is to attempt to use the Many Worlds Interpretation (MWI) theory to explain how an appropriate meaning is constructed by a listener from among myriads of other possible interpretations in an interaction. Even more importantly, the study hopes to approach this quest from the situation of English as a second language, with Nigeria as an example. The main objective is to see how the MWI theory can be useful as a tool of explication in language construction and interpretation. It also tries to see how the 'worlds' constructed by a user of English as a second language can markedly impact meaning definition in interactions. This paper takes the position that while speakers are engaged in linguistic as well as other interactions, they are constructing different 'worlds' from which emerges one that is appropriate to the situation and which exposes the intended sets of meaning.

In order to examine the potency of the MWI theory, the paper shall apply it to various language situations. These include samples of verbal interactions, metaphor usages, and cartoon pieces. We believe that these can give us the chance to examine how language use provides cues that enable meaning construction. Thus, the MWI theory will be applied mainly to linguistic outputs, and nothing else, in this study. Literary, historical, religious or performance experiences can be simultaneously envisioned by the reader in the course of this linguistic examination to determine the efficacy of the approach on such events. Through this, the study may be able to make prescriptions on the relevance of the theory to other areas of scholarship in the humanities.

3. MWI (or Parallel) Theory

It is a given that in the MWI theory, every possible interpretation given a piece of language is roughly tangential to a 'world' of 'a happening'. A language event with many interpretations can thus elicit many 'worlds'. Obviously, the theory of MWI is quite complex, being grounded in quantum physics; therefore, we shall be restricting ourselves to a very elementary discussion of its contents. Thus, only those aspects considered germane to a basic understanding of the concept by the author and the reader shall be emphasised.

It is claimed that the MWI theory is a reaction to the earlier claims by scientists, particularly philosophers such as Berkeley (1685-1753, Wikipedia.org), that information has no objective reality; all things exist because they can be perceived by the human mind. However, Everett is said to have advanced the theory that information has a material or physical reality, independent of human consciousness (Tyson 2008, n.p.). This view is said to have revolutionized how information was perceived and directly or indirectly contributed to the advances witnessed today in the way information is passed across the globe through various media such as internet, web or email systems.

In his work, Everett conceived the MWI which says that every time there is an interaction between two entities, many 'worlds' are created through 'splits', with each split being a world. Interactions cause 'splits' – a split of a viewer interacts with another split of the object, resulting in multiples of splits – which can assume any number of possible positions. As a matter of fact, the splits of a single interaction, say observing a clock, are said to be literally incalculable but running parallel to each other. Hence, the awesome amount of interactions of elements and entities in the world has caused to be in existence an endless and infinite number of splits or worlds (Tyson 2008, n.p.). In the words of Vaidman (2008, n.p.), *the fundamental idea of the MWI, going back to Everett 1957, is that there are myriads of worlds in the Universe in addition to the world we are aware of … which exist in parallel at the same space and time*. A world, according to Vaidman (2008, n.p.) is *the totality of (macroscopic) objects: stars, cities, people, grains of sand, etc., in a definite classically described state*.

> … physicists divided the universe into two different worlds. One was the indeterministic microscopic world, where elementary particles fly around. Two was the deterministic macroscopic world, which is the world of our

> experience, where objects are large, where cause and effect are linked; in physics, this is called the "classical" world. The quantum world builds the classical world. Everything in the classical, macroscopic world is composed of microscopic particles acting in unison (Tyson 2008, n.p.).

What this means is that each time there is an interaction between two entities, myriads of worlds are said to come into a parallel existence. This is further explained in the excerpt below by Tyson (2008, n.p.):

> Everett came up with a solution showing that the observer, the human being, correlates with every possible state that (a) gram of carbon, (or) pencil tip, could be in. So *before* the human being looks at the gram of carbon, the carbon is in all the millions or billions or trillions of possible states, and *after* the human looks at the gram of carbon, he or she is in one state. In Everett's theory, what happens *in between*, as it were, when the human actually looks at the carbon—or a clock or any other object—is that he or she splits like an amoeba. (The act of looking, that interaction, is just exchanging energy. A person looking at a clock, for example, is an energetic interaction, with photons of light bouncing off the clock and going into the person's eye.) So, in Everett's view, when the human correlates herself—that is, interacts, exchanging energy with the gram of carbon or a clock or whatever—she splits like an amoeba. She splits into copies of herself, one for each element in the superposition.

The MWI theory is said to consist of two parts, only one of which is relevant to the philosophies. The first, which is *a mathematical theory which yields evolution in time of the quantum state of the (single) Universe* (Vaidman, 2008, n.p.) is summarized as a relativistic generalization which is more relevant as a core mathematical theory and is hardly philosophically applicable, while the second one is more relevant to philosophical enquiries. It states that *a prescription sets up a correspondence between the quantum state of the Universe and our experiences* (Vaidman, 2008, n.p). This involves "our experiences" which do not have a definition. In the words of Vaidman (2008, n.p.) …an *additional difficulty in setting up (this second part) follows from the fact that human languages were developed at a time when people did not suspect the existence of parallel worlds. This, however, is only a semantic problem.* Furthermore,

> The concept of "world" in the MWI belongs to part (ii) of the theory, i.e., it is not a rigorously defined mathematical entity, but a term defined by us (sentient beings) in describing our experience. When we refer to the "definite classically described state" of, say, a cat, it means that the position and the state (alive, dead, smiling, etc.) of the cat is maximally specified according to

> our ability to distinguish between the alternatives and that this specification corresponds to a classical picture (Vaidman 2008, n.p).

Going by the standard definition of a world given above in which observable things and states such as sun, moon, stars, buildings, people exist, etc., the concept of "world" in the MWI theory is thus a concept for describing the observer's experience. Hence, a "definite classically described state" of a building, for instance, means that any of the positions and states (standing, beautiful, new, old, fallen, in disrepair, etc.) of the building can be conjectured and would hold as being possible since they all exist in a continuous state in reality as parallels (i.e., superpositions). The one that is specified as being classical can be determined by one's ability to distinguish between the quantum of alternatives. That specification should also correspond to a classical picture. In other words, superpositions, i.e. the continuous possible states of a being, can be allowed in a single world. It is thus not possible for a specified building to be standing and also be fallen at the same time. Only one alternative is allowed in our experience. From the foregoing, we can presuppose the following characteristics as pertaining to the existence of 'worlds':

1) The existence of worlds results from interactions with sentient beings;
2) Worlds are parallel; each one exists independently of the other;
3) Each world constitutes a view that sums up the entire experience of the object;
4) Worlds exist in waves or superpositions; etc.

All of these are pertinent to the object of this study, as they provide the background for understanding how an individual 'chooses' a 'world' and how other unselected worlds do not collide with each other or the one selected. Let us therefore look at each of these more closely.

3.1 Worlds are interactional:

The Many Worlds theory recognizes that the existence state of objects depends on the observation by a sentient being. Let us take again the example given above of someone viewing a pencil tip or a wall clock. The pencil or clock and the observer are said to decompose into different parts upon interaction, each constituting different states in different worlds. In other words, there are splinters of the observer interacting with splinters of the pencil or clock, all of which must bear coherence with the experience. A clock is observed to be a single piece on perception because its different parts have been assembled by the mind, hence the origin of the *Many-Minds* theory. Therefore,

the interactional property of many worlds evokes participants (i.e., observer-object, speaker-hearer, addressor-addressee, etc.) whose splinters (or superpositions as explained below) interact at different microscopic levels of co-existing parallels that eventually constitute an observable, macroscopic classical world.

3.1.1 An example of a metaphor

Let us take the example of a metaphor: *That politician is an animal*. In this example, the assumed participants include a speaker with a presumed hearer (sentient beings) interacting in myriads of quantum worlds from which we observe a classical world. In that world, both the speaker and hearer are at a more complex interaction where the politician is compared to an animal. At this level, both the speaker and the hearer are in many superpositions (standing, sitting, eating, talking, walking, etc.) as they view the politician performing many actions. Thus, the participants may view him in approbation, condemnation, laughter, tears, etc., depending on which of the politician's acts the classical world selects. The politician himself is in many superpositions as an animal (monkey, lion, rat, donkey, dinosaur, etc.).

The expression takes on more meaning in the Nigerian situation as a politician can be envisioned as an animal in many more worlds. He could be in various superpositions wearing a Nigerian agbada or English suit, fat or thin but pot-bellied, holding public office, moving around making pompous statements or sitting in an office and being worshipped. For example, in the classical world, a Nigerian state governor was said to have appointed a room for receiving visitors in which there was only one arm chair that he occupied. Visitors had to sit on the floor.

Furthermore, he can be seen in many worlds where he is behaving like an animal: literally 'eating money' (Nigerian parlance for the act of converting public property to one's own use) without any care or fear of public sanctions, piling up public funds in private accounts without any self-check or limits, just as an animal (e.g. rat) piles up objects it does not need. Even more, there can be worlds where such actions can secure public approbation or not; worlds where he is sanctioned or not by the public; worlds where the politician enjoys public goodwill particularly if he distributes some of the funds indiscriminately or purposelessly to the public or keeps the loot hoarded up in foreign banks; worlds in which he displays natural animal-like character,

i.e. one in which he behaves in ways that show a lack of mediation by civilisation as often found in Nigeria. Thus, the classical world that the metaphor collapses into for the Nigerian is one mediated by what s/he is constantly exposed to, i.e., one that he experiences, and that is one where politicians do not possess the ability to reason.

The interesting yields of superpositions in metaphors are thus complex and infinite depending on the level of interaction. All the superpositions that are pertinent to the understanding of the utterance would relate with the situation; i.e., they would be observed to be relevant. For example, it would be inappropriate for the upheld splinter of the observers (speaker/hearer) to be in a state of approbation while naming the politician as an animal, which, in the classical world, is a lower, sub-human specie. This would not bear coherence with the picture. The more appropriate classical state would be the condemnatory superposition in the Western world but ambiguous in the Nigerian world. It should be noted that each interaction constitutes a world of superpositions in parallel movements at the microscopic level, one of which emerges as the classical, macroscopic world in which at least the speaker and hearer see the politician as someone to condemn or envy.

Going by the MWI theory, people bring different worlds into the construction and deconstruction of metaphors in language situations such as conversations, joking situations, riddle telling, speeches, discourses, etc. involving two or more people as instances. In fact, the more the people involved in a language event, the more the worlds that are likely to evolve because each language utterance is capable of decomposing into myriads of parallel worlds that constitute a partial view of the entire entity. The result is that the worlds in an interaction between an object-perceiver are literally infinite and exist independently of each other. It therefore stands to reason that the perspectives that people bring into talks are infinite and often parallel. This is why it is possible for understanding, misunderstanding, incomprehensibility, etc. to occur in talks.

3.2 Worlds are Parallel:

As stated above, when interactions take place between a viewer and an object, it results in many continuous splits of the two entities, all of which exist as different worlds. Their existence, however, is said to be parallel; i.e., the multiple fractions do not meet, neither are they glued

together but move as independent entities or waves in space. This explains why the theory is sometimes called the parallel world theory.

However, when one views a clock, both the viewer and the clock are observed to exist as single units each because the different fractions involved in the process of viewing are said to collapse into one single unit that can be observed. This is explained as follows: *...some people, especially philosophers, have been attracted to the idea that human consciousness collapses the wave function* (Tyson 2008). The collapse theory was said to have been rejected by Everett who maintained that rather than collapse, the different superpositions continue to exist in parallel worlds. This is why it is possible for someone to be both dead and alive, or for an object to be in a predictable number of different positions when viewed a hundred times. However, only one of the superpositions is observed in the macroscopic world. In short, the myriads and myriads of the superpositions cannot be seen since only one superposition is observed, and the choice of this one is said to be dependent on probability through a process called decoherence, which is explained below.

3.2.1 An example of a political cartoon

Please send us a new one

Source: Franfurter Rundschau, Germany

In the German political cartoon above, a letter has been written to God asking him to replace a disused and spent earth. Indeed, many worlds are created from the various interactions in the cartoon: between the reader and the cartoon; between man and God; between man and the

earth, between the reader and God (will he, won't he?), between God and the earth, etc. In the interaction between reader and cartoon, the latter can be in various states: the earth in the cartoon is perfect, half perfect, spent; the picture of God is pleased, not pleased, half pleased, etc. In the interaction between man and God, it is possible to have myriads of states in which man sees or does not see God as the author of the earth, sees chance as the author, or some other story of earth's origin, etc. Again, in the interaction between man and the earth, it is possible to have superpositions in which man has used the earth wisely, badly, wretchedly; and it is collapsible into a carton, replaceable, not replaceable, dead, dying, in good condition, reparable, separable from the people living in it, etc. All of these occur as parallel worlds that do not meet.

All the superpositions are said to run as parallels, from which emerges one where man sees God as the creator of the earth; thus, if he created it before, he can do it again (i.e., send another one). There are other silent superpositions in the cartoon such as where man is staying or living while the earth is sent for repairs or replacement; who sent it; to which address; how it was sent and how it will be sent back; etc. Thus, the many worlds created in this simple cartoon portray the classical meaning that the earth is physically dying and man is helpless, so he has resorted to appealing to a higher authority: the presumed author. This is in keeping with the African (and Nigerian) world view of the helplessness of man under a higher and divine power, and represents a classical illustration of a perspectivised view of a subject.

3.3 Worlds are perspectival:

Each fraction into which objects decompose is said to constitute a perspective, a partial view of the entire entity. This is the crux of experientialism that allows coherence to gain ground. In other words, coherence allows each superposition to be a possibility in the plane of existence. Perspectivalism can be illustrated with the application of the MWI theory to the concept of identity and individuality. Vaidman (2008, n.p.) reports thus:

> Every time I perform a quantum experiment (with several possible results) it only seems to me that I obtain a single definite result. Indeed, Lev who obtains this particular result thinks this way. However, this Lev cannot be identified as the only Lev after the experiment. Lev before the experiment corresponds to all "Lev"s obtaining all possible results. Although this approach to the concept of personal identity seems somewhat unusual, it

> is plausible in the light of the critique of personal identity by Parfit 1986. Parfit considers some artificial situations in which a person splits into several copies, and argues that there is no good answer to the question: Which copy is me? He concludes that personal identity is not what matters when I divide.

This explication suggests that, in quantum theory, there is no single copy of an individual but several copies resulting from interactions with objects (or people) in a wave function. The wave function, consisting of the several configurations an object can possibly be at, leads to the superpositions the object can be viewed from. Consequently, the view taken by the quantum state of an individual viewing a subject also in a quantum state can only be experiential, depending on probability. Probability occurs as a result of the fact that when a measurement is taken by an observer of an object, it can be in one or other of any of its given superpositions.

The analogy to this can be seen in the direction 'Get out!' to a listener. He/she can comply, refuse to comply, break into laughter or tears, slap the speaker, or assume any one of the multiple reactions the expression can elicit. The measurement of the most likely reaction that would occur is explained in Vaidman (2008, np) thus:

> To solve this difficulty, Albert and Loewer 1988 proposed the Many Minds interpretation (in which the different worlds are only in the minds of sentient beings). Whenever the quantum wave of the Universe develops into a superposition containing states of a sentient being corresponding to different perceptions, the minds of this sentient being evolve randomly and independently to mental states corresponding to these different states of perception ... This resolves the difficulty: each "I" corresponds to one mind and it ends up in a state corresponding to a world with a particular outcome.

3.3.1 An example of a sentence

As can be observed, it is not very clear how all the probable outcomes resolve into a particular one. For instance, how can we determine which of the outcomes is meant in an expression such as:

Mary beat her sister in the race

In the many minds theory, it will be possible for Mary to beat her sister in several ways: physically, emotionally, psychologically; or win against her sister in an actual race for food, job or physical race, while running, eating, drinking, etc. These plausible worlds will then collapse into a classical one that corresponds with a particular outcome known to the speaker and hearer. Take the following example:

3.3.2 An example of a dialogue

A: (a Student, seeming to pass by a University lecturer's office): Well-done, ma.
B: (Lecturer) Thank you, Mr. L. Have you submitted your essay?
A: No, Mummy. That's why I came. Can I submit it tomorrow?
B: No, the deadline has passed.

From the many suppositions that this interaction in an English as a second language situation supplies, many classical worlds are perspectivised: a world in which someone who is at work 'is doing well' so can earn a greeting of 'Well-done'; a world in which the lecturer is regarded at once as a teacher and a mother; a world in which deadlines are not deadlines; in which students respect the faculty members but do not obey instructions; and many other worlds. In order to be able to predict more accurately which one of the superpositions becomes the macroscopic or classical world, we must consider in greater detail the question of superposition.

3.4 Worlds occur in waves or superpositions:

By now, we know that worlds occur in superpositions. Superposition is explained, using the example of a superimposed photograph, as resembling a piece of photographic film that has been exposed several times and thus gives many overlapping images. This analogy is used to describe the various positions an object can assume before, during and after an observation such that the object exists in waves and one's observation simply picks one of the assumed states. For example, a child left in a room to play can be observed continuously through an open window as he/she assumes different positions while banging his/her toy, chewing on it, sitting on it, talking to it, walking around with it, sleeping by it, etc.

On the other hand, if there was no window and one could observe the child by opening the door once in a while, the child would be in any one of the positions described above while the others would not be seen; yet this does not negate their existence. This is known as the Schrodinger's cat equation. Each of the superpositions the child assumes (observed or not) constitutes a different world which then constitutes an experience and becomes perspectival, and assumes a parallel existence with others. However, while the position assumed by the child when the door is opened can only be predicted by chance or probability as stated above, each of the positions or waves of an object

is said to be as real as any other. Irrespective of the eventual position that one may perceive an object to be in after all, each superposition is equal to the other. Indeed, it is said that any one of them has an equal probability or chance of being selected. Let us use a couple of jokes to illustrate this. Consider the following:

3.4.1 She has two teenage children but no other abnormalities.

3.4.2 Employer to employee: *I've got great news. You managed to avoid a salary decrease.*

Cartoons and jokes typically evoke and actually employ many superpositions both in their construction and deconstruction, which result in contradistinctions to make meaning. In our first joke above, superpositions of children are made to interact with those of abnormalities to result in a dissociative meaning. On the one hand, waves of children may be affected by such variables as age and sex, and perhaps in all kinds of conditions such as being well, sick, eating, playing, talking, schooling, etc. These are all taken to be normal activities that are associated with children. From this, we have an unending number of children of all ages and both sexes involved in all kinds of activities, thus constituting an unending number of parallel waves.

On the other hand, we may view all kinds of abnormalities as constituting another parallel line affected by variables such as typologies (e.g. psychosomatic mental problems, physiological disabilities, behavioral abnormalities, etc.), and severity (e.g. mild to acute). Laughter is thus generated at the point when the two parallel structures of having disabilities and having normal children are forced into cohabitation. In other words, at one point in the journey of these parallel waves, a superposition from the children's worlds comes in contact with another from the worlds that make up abnormalities to yield this dissociation which is that teenagers constitute some kind of abnormality. A joke then is the coming together of two dissimilar worlds to result in a dissociative meaning. In cartoons and jokes, a clash of superpositions occurs in the structures to give meaning.

The same process is repeated in the second example. Parallel worlds, from what we know as good, bad, ugly, great news, are suddenly brought in juxtaposition with the worlds associated with work such as work conditions, descriptions, promotions, demotions, transfers, emoluments, etc. For example, in the worlds that concern work, emoluments are generally reviewed upwards. Downward

reviews are not unknown, while static reviews are not mentioned; but when they occur, they are not regarded as 'great news'. In the example, worlds related to a static salary review (not making financial progress) juxtaposes with the 'great news' (actually making financial progress) to result in a joke. At that point, the parallel worlds actually clash.

Let us look at the following West African joke however:

3.4.3 A man was sick and was taken to the hospital. While the relatives waited in the waiting room, a doctor examined him in the consulting room. A little later, the doctor came to the waiting room to announce the result of the examination. 'Your relative has ... HIV AIDS'. Everyone immediately broke out in jubilation while the man's sister called their mother at home. 'Mama, Mama, it's good news. Brother X does not have Ebola. It's only AIDS he has O. Thank God O!'

The superpositions of this joke are many. They include a man being sick and not being sick; his having Ebola and not having Ebola (the deadly viral disease currently plaguing the West African sub-region); his having AIDS (a frequently terminal disease) and not having it; a situation of AIDS being better than Ebola or Ebola being better than AIDS; and so on. However, the most perspectivised of the superpositions is derived from the physical location – West Africa where there is an outbreak of Ebola virus; the palpably desperate fear over the wildly contagious Ebola virus; preference of people for the less contagious AIDS disease; ignorance about the AIDS virus; the deep seated belief in the mercies of God; the belief that all good things come from God; etc. Thus, the worlds of Ebola and AIDS meet in a contest or collision to present the meaning of the joke: that AIDS is preferable to Ebola as a disease; hence the fear of Ebola!

From the features of the worlds described above, it can be seen that the many worlds theory attempts to explain what happens when there is an interaction between sentient beings or objects and other sentient beings or objects. It proposes that trillions of the versions of each event come into existence as parallel worlds since a world is an existence, but only one out of these trillions can be observed. The task that has been before philosophers for quite a while seems to be how to account for the choice of only one out of these multiverses. One of the proposed solutions is decoherence.

4. Theory of Decoherence

Contrary to the previous scholars' views that all waves lose all of their

other possibilities and collapse into only one possibility, Everett is reported to have believed that interactions with objects cause observers to split into multiple copies of themselves in order to accommodate all the elements within that superposition (Tyson 2008, np.). However, the copies, when correlated to an element of the observed object, do not meet but eventually go off on their own into other universes, i.e. without making contact with each other. The parallel 'multiple universes' theory raises the possibility that all kinds of things thought of, imagined, or said could be taken to have occurred. This makes everything that can happen become possibilities in other universes, leading to the occurrence of many worlds.

It should be noted that the unobserved microscopic world constitutes the ground for the creation and existence of the infinite number of worlds from which the classical world emerges, as stated above. The question remains though that when many worlds occur at a single instance of reality, how is it possible for one to obtain a single classical world where a version of an individual with their perceptions, history, characteristics, strengths and weaknesses, sets of relatives, etc., exist? Put differently, the question is how is it possible, in this theory, to calculate the probability of the occurrence of a particular superposition to hold? The answer may lie in the theory of decoherence (Tyson 2008, Zurek 1991, 2002).

To understand decoherence, we have to first know what coherence implies. According to physicists, an object is in a coherent state when it evolves into an infinite number of superposition states during interactions, all of which are kept from collapsing or merging together to become something like jelly. Decoherence is what explains how these superposition states result into what is observed as large substances in the classical world. It removes the barrier between the quantum world and the classical world.

Many postulates have been advanced to explain what happens in decoherence. They include the consistency postulate which says that once a result is obtained from a quantum world, all other possible outcomes must disappear (No Author, 2014, p. 21, physics.ucsd.edu). This postulate does not however explain how this result is obtained. The collapse model states that once a measurement is done, all other components of the superposition disappear. This means that total loss of coherence is equivalent to collapse, thus raising the classical probability. This however does not predict the classical state that

Schrödinger's cat is observed in.

The most prominent of the tools of decoherence is probability (Vaidman (2008, n.d; Zurek, 1991; 2002); this is what attempts to make the transition from a coherent state to the classical world more explicit. It can also be related to what happens in interactions. Myriads of meanings are 'cohered' in an interaction since each one brings about myriads of worlds; however, only one is selected by an interlocutor. The onus on the theory of decoherence is to show how this is possible. From the literature on this theory, three variables can be identified as belonging to the process of decoherence – history or time, experience and contextuality or environment (Aaronson, n.d.; Zurek, 1991; 2002). Let us look at each of these.

4.1 History or time

History is linked to time, with a past, a present and a future. *According to the MWI, a world defined at some moment of time corresponds to a unique world at a time in the past, but to a multitude of worlds at a time in the future* (Vaidman 2008, n.p.) Past time is linked directly to the root of the multiple universes into, for example, the origin or beginning of an interaction, such as the moment one begins to look at a clock. A farther beginning can easily be conceived such as a decision to do something at a particular time, the anxiety about the time approaching, the decision to check the time, the sound of the clock ticking, etc. These constitute multiple universes going in all kinds of directions but which have been decohered into that classical knowledge that the time is checked at a certain period. According to Vaidman (2008, n.p.) again,

> Further, the state of an object (e.g. alive or dead) is meaningful only if the object is considered for a period of time. In our construction, however, the quantum state of an object is defined at a particular time. In fact, we have to ensure that the quantum state will have the shape of the object not only at that time, but for some period of time.

Relating this to the copular metaphor, *He is a pig*, gives a decohered classical state that suggests a unique memory about an individual which leads to a current state. It suggests quantum microscopic worlds in which the speaker has observed, perceived and interacted with pigs, and has full knowledge of their characteristics and behavior patterns. It also suggests previous knowledge of the characteristics and behavior patterns of the target of description based on perceptions

and interactions.

History also implies future time. Future time relates to the increase in the entropy of the quantum worlds of the events spoken of. By this calculation, the more the entropy that occurs in the worlds, the more classical the macroscopic world would be. Future time in *He is a pig* refers to a decohered universe in which *He* (i.e. the individual spoken of) or *The Politician* in our metaphors are conceived as being incapable of change of habit or character on account of the 'multiverses' in which their behaviours remain constants.

In an interaction, either between speaker/hearer or object/perceiver, cultural history enables the different worlds generated. Yet, what the hearer/perceiver deduces to be the classical world is supported by the cultural history of what is known about pigs, an animal that is forbidden from being consumed or regarded as the dirtiest of all animals especially in Africa; about teenage years (long associated with the turbulent period of man's growth); politicians (culturally regarded as unfeeling, hoarders of public funds in Africa's long history); disease knowledge based on historical knowledge; and so on. Both past and future times, in addition to experience, therefore help to perspectivise events for an individual.

4.2 Experience

Experience implies interactions with spaces and objects, and is conceived as being subjective because it not only defines individuals but is also conditioned by time. In the words of Vaidman (2008, n.d)

> There are many worlds existing in parallel in the Universe. Although all worlds are of the same physical size (this might not be true if we take quantum gravity into account), and in every world sentient beings feel as "real" as in any other world, in some sense some worlds are larger than others. I describe this property as the *measure of existence* of a world.[5] The measure of existence of a world quantifies its ability to interfere with other worlds in a gedanken experiment, see Vaidman 1998 (p. 256), and is the basis for introducing *probability* in the MWI. The measure of existence makes precise what is meant by the probability measure...

The example relating to Schrödinger's cat, which can be in a superposition of being alive or dead, provides a frame for how a perceiver interacts with an object. It has been stated that in quantum worlds, whatever can be imagined to have happened has actually happened. For example, in quantum worlds, this article was both

written and not written. However, in our example, the experiencer's quantum identities interact with the *He* and determine the classical fact regarding not only the object of description but also what is meant by the description.

All together, the concepts *He is a pig, the politician is an animal* raise very many possibilities in decomposition, and therefore very many worlds. These worlds include one in which a man is observed to grunt around rather than talk, looks exactly like a pig, is pink all over, has four limbs, a snout, a soft body and a hanging belly, eats all the time, likes to roll around in dirt, etc. However, the expression culturally suggests the possibility of the behavior of the subject resembling that of a pig: being indifferent to any kind of order, carelessly flinging things around the way pigs scatter things with their hind limbs, grunts his speech, eats carelessly, is dirty in his habits, etc.

In this parallel-worlds interpretation, a man can be observed in many superpositions or waves as a pig, all of which are possible and are actually said to exist. It is thus possible, and it does happen that a man can grunt, scatter items irreverently and is pink all over, and has trotters. It is also possible to imagine that his sets of features remain human-like, but may resemble a pig in behavior or manner. The choice of which one of these possibilities is computed is decided by probability, which can be resolved by the contextual permutations. Sociocultural context, the accumulation of experiences within a particular environment over time, increases the level of probability. While context will determine whether or not the utterance refers to his looks, his behavior or the sounds he makes, the sociocultural context helps to define such matters as a group's perspective of an object, event or individual, etc.

4.3 Environment or contextuality

According to Zurek 1991, p. 37), 'Macroscopic quantum systems are never isolated from their environments.' Context is the interaction with the environment. Environment refers to many of the pieces of information relating to the circumstances of events, the most prominent of which is the physical environment. In Zurek's (2002, p. 10) words, 'It is certain that the detector environment plays a decisive role' in the process of decoherence. He further states that 'Interaction with the degrees of freedom external to the system – which we shall summarily refer to as the environment – offers such a possibility' (p. 9).

In language related interactions, environment is the summation of all the background knowledge surrounding the events, and the one that is taken for granted by the participants in the talk. This background knowledge includes knowledge about the location, participants, temporal matters, culture, previous knowledge, and what constitutes classical knowledge between the interactants, etc. Just as these matters can increase the chances and changes of the superposition of Schrödinger's cat on observation, so also do they all constitute postulates that increase the probability of an intended meaning being selected. Indeed, as mentioned earlier, cultural context increases the probabilities.

In *Mary beat her sister in the race*, the quantum mechanics envisions different superpositions of Mary at once in a race and not in it, or her sister being in the race and not being in it, the plausibility of her being in it at all, and so on. Mary is seen in waves running past her sister; multiples of her may also be seen interacting with a cane while running and using it to attack her sister; another world can be envisioned in which Mary wins a contest against her sister; while yet another world presents a possibility of Mary attacking her sister while a race is going on whether or not either of them takes part (which is possible in the Nigerian context where corporal punishment is allowed); etc.

Furthermore, a teenager as an abnormality is possible in some African cultures where having a child outside wedlock is frowned at, e.g. in a religious or morally taut rural setting. Naturally, this measurement will not only alter the meaning but the intention of the utterance, which is to make a joke. In the many-worlds theory, all these possibilities take place, yet when we examine (or measure) it again, only one possibility is allowed. They are all decohered into a single classical possibility by the history, experience and contextuality of the participants as to who Mary is, what constitutes beating, or what race is known in that context.

Another example, *He reaches a new milestone each year*, invokes a world in which a subject is envisioned in a sequence of physical positions constantly running and stopping at every milestone. We can also envision one in which an entity sets a goal or target (perhaps money or position) for himself each year and reaches it or does not reach it. There is also a world in which he simply adds a year to his age; etc. In the African experience though, milestones can be envisioned as

socially constructed targets aimed at the education of an individual, such as age-graded tests, wealth related tests, maturity related tests, etc.

In addition to all the above, discourses such as greeting-greeting, question-answer, insult-counter-insult, literary texts, religious texts, advertisement texts, legal texts, speeches, etc., all bring out infinite numbers of worlds in Africa. Take the greeting 'well done' which, when used in the native English environment, suggests a world in which commendation is given for completing a task. In the Nigerian (Yoruba) environment, however, the culture of mandatorily greeting anyone seated, older or at a task adds other worlds to the native speaker's worlds. It adds worlds in which interactants are simply acknowledging each other's presence, or one younger member expressing politeness to an older member of the community.

Clearly, each of the samples can be decohered by the historical, experiential and contextual perspectives to present a world unique to the experiencer. These tools provide the particular perspectivised, classical world which the participant understands from the interaction. In the theory, each participant is coming from, with and into many worlds in an interaction on account of differences in history, experiences, contextual cum cultural knowledge. These cause participants to invoke different superpositions when they interact with different people, objects, events, spaces, etc., in order to construct meaning.

The attraction in using the MWI theory in linguistics lies in the fact that it explicates different perspectives that lead to people's judgments and choices of meaning. This is particularly useful in studies in language interactions, meaning explication, dialogic interactions, character analysis, historical perspectives, problems of conflict in marital, religious or even diplomatic spheres, literary or stage functions and interpretations, language structures and the very many points of view that words invoke. In sum, it takes seriously the challenge of understanding human behavior.

In spite of the attraction of this theory, however, several problems have not been resolved satisfactorily. According to Tyson (2008, n.p.), how can probability be effectively utilized to determine why the waves did not collapse into a world in which Oyinkan Medubi (this author) is a rich heiress who does not need to work; while only one of it exists in the classical world in which she has to work? Secondly, what happens to the so many other unused worlds splitting off in every interaction?

Further enquiries into this theory will perhaps provide some answers to these questions.

5. Conclusion

No doubt, the Many Worlds Interpretation theory has a lot to offer science and the humanities. For one thing, it has become a philosophical tool in its enquiries on how to account for how man interacts with his/her environment. For another, the theory attempts to see interactions as a series of branching universes that make up what physicists call multiverses which contain *trillions* of copies of everyone.

From our analyses above, we find that while speakers are engaged in linguistic as well as other interactions, they are constructing different 'worlds' from which emerges one that is appropriate to the situation and which exposes the intended sets of meaning. Individuals arrive at the known classical state by perspectivising events through their experiential knowledge of the background of such events. Worlds collapse into a perspectivised world on the basis of previous knowledge, a sense of history, experience and knowledge of the time surrounding the events.

Moreover, in a second language situation such as English in Nigeria or anywhere else, the perspectivised world of participants is further enhanced by cultural knowledge. This means that participants' interactions with persons, objects or events depend on cultural knowledge to enable them arrive at the necessary connotational meanings; thus upholding the saussurean notion that no two languages correspond in terms of perspectives. According to Lee (1992, p. 25), the sausurrean notion expressed in structural linguistics, deconstruction, etc., conveys two strands: that 'language structures thought and ... different languages dissect reality in different ways (both of which) converge on the suggestion that to acquire a particular language is to acquire a particular way of perceiving the world'. This notion holds that language comes from an existing structure pertaining to the world of the speakers and is thus not self-existing.

However, the MWI theory has an added advantage. It enables interactants to cognitively understand not just the world of the thought and language producing system but that of the participants as well as they interact with each other and every object around them. This is more pertinent in the second language situation. No doubt, the second language situation causes disparities in language usage from that of

the native language situation. The reason is that a language event causes the construction of very many more worlds, which many times even conflict with the designated classical world in the first language.

We can thus summise that language users construct meaning from language events on the basis of previous knowledge, their sense of history, social experiences and knowledge of facts surrounding events. This work proposes that the ***parallel worlds linguistics***, deriving from the application of the MWI theory to language events, can serve as a system of enquiry into how parallel worlds come into being in interactions, from which the intended classical worlds (or meanings) emerge. The appeal of this approach to the humanities can be mounted on the pedestal of how it attempts to account for man's understanding; how this understanding leads to choices and how these choices can be understood in matters of language, literature, historical events, or religious worship against the background of culture. More studies are, however, required to examine how the approach can be useful to each of these branches.

We conclude therefore that there is no particular 'world' in an interaction; there are as many 'worlds' as experiences and cultures dictate. In the many-worlds theory, it is said that everything that is possible is actually happening in some branch of the multiverse or the other. However, only one classical world is observed in an event, interaction or situation. The *parallel worlds linguistics* provides a credible framework for understanding how that 'world' comes about. The approach, taken from the MWI theory, can be used to show that meaning is enhanced by individual manipulation of cultural choices, particularly in second language situations.

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