Spin States of Selection: Predetermined Variables of 'bit'

Author: Manuel S Morales © 2013
msm@physicsofdestiny.com

Abstract:
The notion of "it from bit", as suggested by physicist John Archibald Wheeler, infers that information is fundamental to our physical universe. This *effect trumps cause* doctrine of different states giving rise to different effects is based on the paradigm of effectual causality, i.e., how observed or measured effects cause effects, not true cause and effect. We explore how *cause trumps effect* by focusing on the mechanical functions of direct and indirect selection and then correlate their causal functions (bit) with their effectual states as states of spin (it). In so doing, we find that the two acts of selection have gravitational characteristics, as such, serve to unify the strong, weak, and electromagnetic forces as one super-deterministic force.

Introduction:
With the advent of quantum mechanics came the notion that information (bit) is fundamental which implies that reality (it) is therefore computable [1]. This asserts that existence is not caused but instead is a manifestation of various states of itself, therefore *effect trumps cause.* This paradigm gives us a paradoxical reality of effects causing effects which gives us a reality that is uncertain and subjective. This sense of effectual reality requires interaction with it in order to exist. This means that this essay you are reading did not exist until you chose to read it. This of course defies all manner of logic, yet here we are. Without an understanding of an objective reality that exist without our interaction with it, we are up the proverbial creek without a paddle. In this essay we will explore how *cause trumps effect* by focusing on the functions of this super-deterministic [2] machine we call choice, the ultimate *bit*. We find by mapping the acts of selection together with their effectual states in conjunction with their corresponding axes that the causal acts of selection *initiates* states of angular momentum and thus correlates with other characteristic behaviors *thought* to be exclusive to quantum mechanics.

"How does something arise from nothing?"

Famed physicist John Archibald Wheeler, who coined the phrase 'it from bit', once asked, "How does something arise from nothing?" [3]. Perhaps the question should have been, how can something be the cause of itself? As physical beings, we have an innate bias to interpret our physical reality by how observed or measured effects (bit) cause effects (it). This perception of effectual causality leads us to asking yes-or-no questions as binary choice states instead of asking how this mechanism of choice works in the first place. The author of the Uncertainty Principle, Werner Heisenberg, addressed the issue as follows, "In as much as all experiments are subject to the laws of quantum mechanics, through quantum mechanics the invalidity of the law of causation is definitively established." [4] If we are to uncover the fundamental interaction of our physical universe then we need to establish what is causal and what is not. Here we find Wheeler's 'it from bit' doctrine of how physical laws are cast as states of information to be insufficient by not stating how those states of 'bit' came to exist in the first place. To avoid the paradox of effectual causality, only non-existence can give rise to existence for causality

cannot exist as binary choice states prior to its own existence in order to be truly causal. This understanding frees us to explore the possibility of an 'immaterial source', as suggested by Wheeler, as a foundational explanation of our existence.

Destiny is a theory that events or series of events are all predetermined, i.e., absolute determinism or super-determinism, and since events are moments of physical energy, then fundamentally it is necessary that this theory applies to the laws of physics, as such, physical beings *cannot act* in violation of the laws of their own physical existence and vice versa. The problem with the destiny theory is that it is commonly assumed that if everything is predetermined (cause) then that must mean that everything is certain (effect). The uncertainty behavior characteristics of quantum mechanics put a stop to the notion of a super-deterministic universe, or did it?

Cause Trumps Effect - The Destiny Theory of The Two Dichotomies of Choice

In order to test this physical theory of cause and effect, we conducted an annual selection-based experiment [5] to determine if choice predetermines the events that follow. After twelve consecutive years, from 2000-2012, the Tempt Destiny experiment obtained empirical evidence that the events of physical reality are predetermined to be certain or uncertain although not exclusively one or the other. The initial findings, entitled "PHYSICS OF PREDETERMINED EVENTS: Complementarity States of Choice-Chance Mechanics" [6] were later presented at a physics convention [7] along with a simple demonstration of how Choice/Chance Mechanics works as exhibited in Figs. 1a. and 1b.

Fig. 1a. Direct Selection (+, +) of One Potential
(Cause & Effect Analysis)

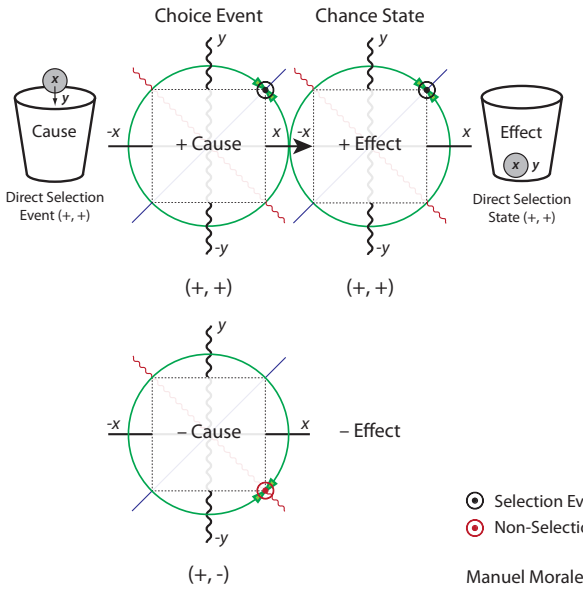
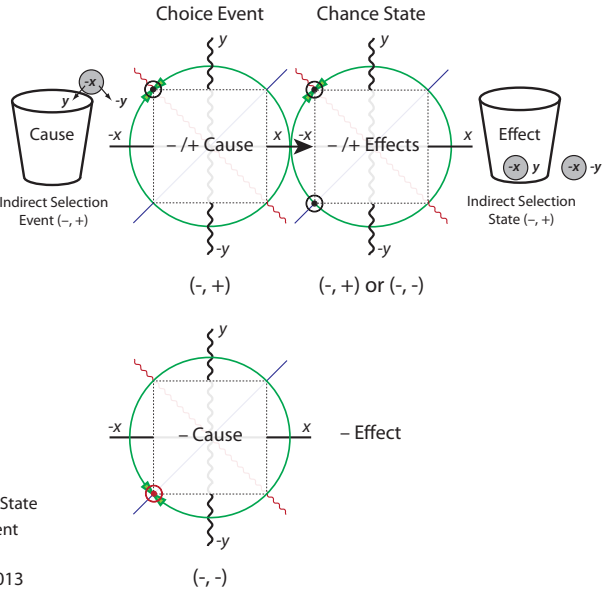


Fig. 1b. Indirect Selection (–, +) of More Than One Potential
(Cause & Effect Analysis)



This is what was learned. Let's say that you drop a coin "directly" into a cup; the outcome is certain, for there is only one potential selected - coin-in-cup, Fig. 1a. Conversely, you drop a coin "indirectly" into the cup by dropping the coin onto the rim of the cup; the outcome is uncertain, for there are more than one potential selected - coin-in-cup/coin-not-in-cup, Fig. 1b. By obtaining certain effects from a direct selection and by obtaining uncertain effects from an indirect selection, you now have addressed all causal possibilities.

Herein lies the fundamental flaw of the perception of effectual causality. You now observe two cups, each with a coin in them; can you tell which coin-in-cup effect was generated by an indirect or direct selection? Without knowing which selection caused the coin-in-cup effect you can *only make an assumption* of how the effect was made. As demonstrated, if you know what "type" of selection occurred (bit), you then have information and thus know in advance if the effect of that selection (it) is certain or uncertain, for the two acts of selection are mutually exclusive and jointly exhaustive of all manner of selection. Here we find that our focus on the states of effects has led us to a false understanding of physical reality; the implications of which requires a reevaluation of what we consider knowledge to be.

Misinterpretation of the Double-Slit Experiment

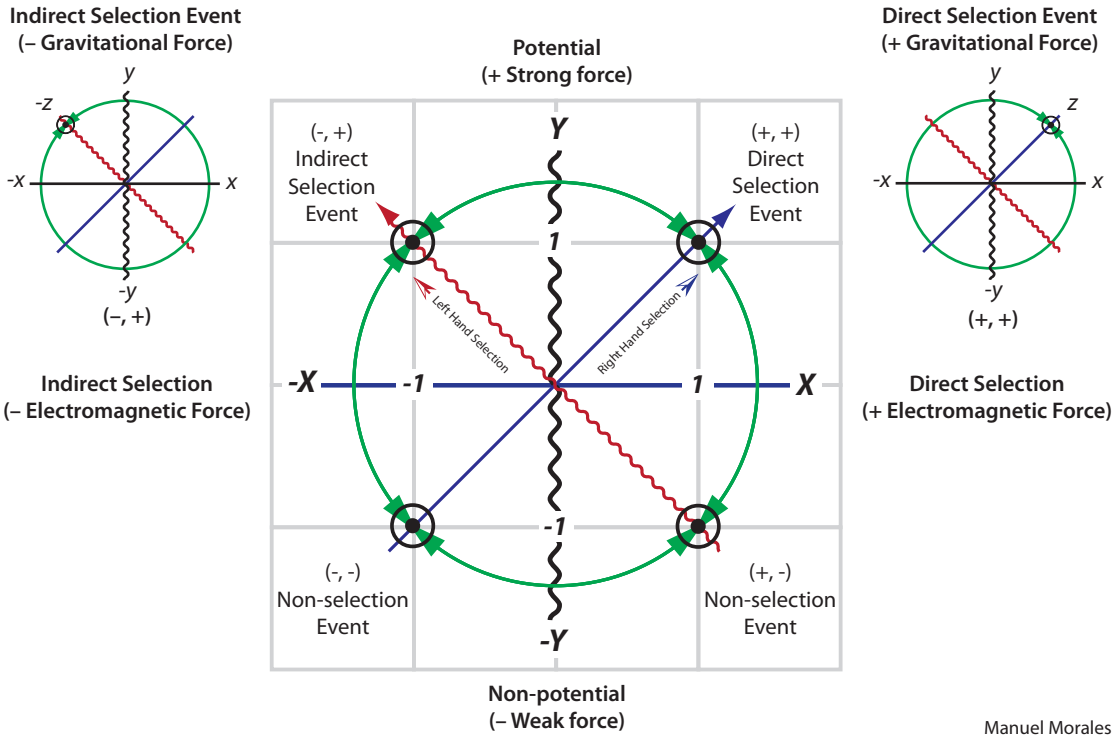
In the "Assumed Higgs Boson Discovery Proved Einstein Right" manuscript [8], we used the coin-in-cup experiment to demonstrate the dichotomy of selection. If we compare the characteristics of the coin-in-cup experiment with that of the famed double-slit experiment [9], we can substitute a proton for a coin and the cup for a single slit and the cup's edge as double slits for the selection functions are the same. If we understand that the slits are in themselves selection mechanisms, with a single slit being a direct selection of one potential and the double slits being an indirect selection of more than one potential, then we have two mutually exclusive causal variables. Note, with a non-deterministic system being non-deterministically selected via two slits, no determination has been made nor can be made to such a system until a deterministic selection is applied (cause) at which point we then observe a wave function collapse (effect) [10]. But let's say that the slits do not function as selection mechanisms. If that were to be true, then we would *not* have two distinguishable and mutually exclusive patterns generated between a single slit and a double-slit. In other words, observation or measurement of the effects of selection events alone gives us a false sense of reality. The mystery of entanglement [11] is based on the failure to recognize that the universal acts of selection are the fundamental causal variables of our existence for we must first make a selection (cause) in order to observe (effect). When we apply the knowledge of the causal variables of selections to particle physics we find Einstein was indeed correct with his notion of hidden variables [12] preventing us from knowing "God's thoughts" as he put it.

Unification of Cause and Effect With The Four Forces

If we understand that a dichotomy is a division into two mutually exclusive or contradictory entities, then it is also understood that it is necessary that both complementary entities exist simultaneously for either to exist at all. This understanding allows us to see how nature gets something (it) from nothing (bit). Since the two selection variables are mutually exclusive and

thus absolute, we use the Cartesian product to graph the two selection variables on the *X* axis, as *X* for a direct selection event and -*X* for an indirect selection event. To represent potentials we use the *Y* axis, as *Y* for potential and -*Y* for non-potential. When we compare the causal behavior characteristics of the acts of selection with that of the effectual states of the four forces [13] as seen in Fig. 2a., we find a correlation exists which warrants further investigation since the acts of selection and the four forces are both manifestations of energy and matter.

Fig. 2a. Selection Events – Physical Force Behavior Correlation

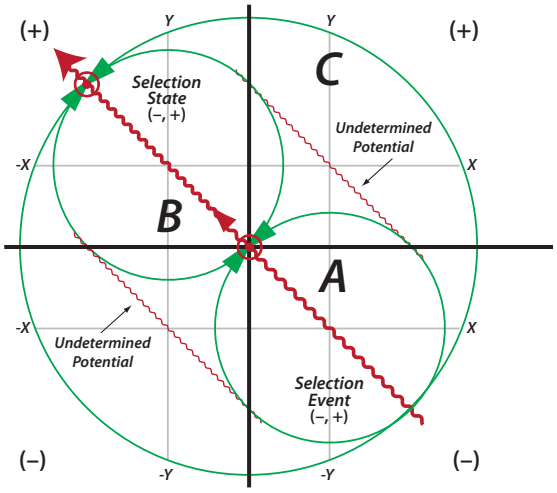


In Figs. 1a. and 1b., we did a cause and effect analysis. If we align however, the selection events with their states on their selection axes we find this alignment reveals a left angular momentum, Fig. 2b., and a right angular momentum, Fig. 2c. Here we have two inclusion maps. In Fig. 2b., the indirect selection event *A* and its state *B* are subsets of superset *C*. In Fig. 2c., the direct selection event *A* and its state *B* are subsets of superset *C*. Note, we have denoted correlation lines of potentiality for future reference of when we later combine multiple series of events in Fig. 8. When we combine the two maps of Figs. 2b. & 2c., we now have one dichotomy consisting of four dichotomies where ABCD are subsets of superset E as exhibited in Fig. 3a. In Fig. 3b. we show the right and left handed properties as revealed by the inclusion map analysis.

Spin States of Selection

In the Standard Model [14], all particles are either fermions or bosons. Fermions have 1/2 integer spin (1/2, 3/2, 5/2. etc.) and Bosons have integer spin (0, 1, 2, etc.). Particles may have left-handed or right handed spins, this corresponds to quantum states in which spin is pointing in the +*Z* (spin up) or –*Z* (spin down) directions. In quantum mechanics and particle physics, spin is an

Fig. 2b. Indirect Selection - Undetermined State
(Left Angular Momentum)



Cause | Effect

Fig. 2c. Direct Selection - Determined State
(Right Angular Momentum)

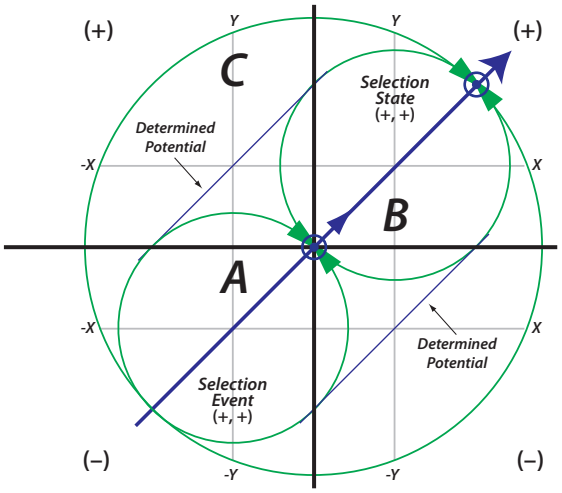
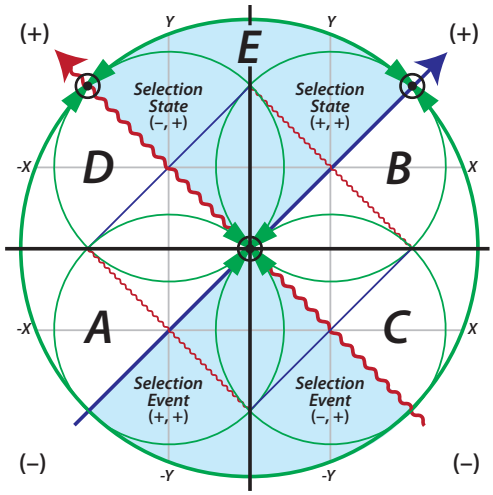
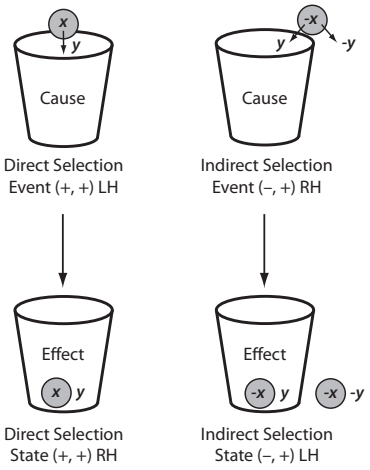


Fig. 3a. Selection Fields - Light Cone Effect
(Right & Left Angular Momentum)



Cause | Effect

Fig. 3b. Coin-in-cup Cause & Effect Analysis
(Right & Left Handed Properties)



intrinsic form of angular momentum *thought* to be solely a quantum-mechanical phenomenon for it does not have a counterpart in classical mechanics [15].

Earlier we established that the acts of selection are causal and when combined with their effectual states on the corresponding selection axis create a state of angular momentum as exhibited in Figs. 2b. & 2c. We have also established in Fig. 1 that it is necessary for a selection event to take place in order for a physical state to exist, hence, no selection = no existence. The questions that remain are how do right hand and left hand selection variables of a causal system relate to right and left handed momentum found in quantum mechanics and how do they relate to the four forces of the Standard Model? To address these questions we need to graph the selection variables step-by-step within inclusion maps in order to examine if the mechanisms of spin and the strong, weak, electromagnetic, and gravitational forces are related to cause an

effect, e.g., selections of potentials and their states. In the graphs, we have included the *X*, *Y* Cartesian coordinates of the selection events/states and their corresponding positive or negative quadrant values on the outer perimeter of the inclusion maps. This provides a means to validate the dichotomies' original values without ambiguity while also defining the positive and negative property characteristics involved. The *Z* coordinates of the selection events and their state are designated by a dot within a circle along with corresponding convergent arrows of angle.

Fig. 4a. On the inclusion map, the direct selection event (+, +) is in quadrant III (-, -) in alignment with its selection axis. This corresponds with the notion of something coming from nothing in that a selection event does not exist (-) until it does. Here we find that we have a strong (+, +) attractive force, i.e., gravity, which is followed by its deterministic state.

Fig. 4b. Since both selection and its potential are positive, we have a singular deterministic positive value $+Z$ and therefore obtain an omnidirectional (+, +) right handed angular spin.

Fig. 5a. On the inclusion map, the indirect selection event (-, +) is in quadrant IV (+, -) in alignment with its selection axis. Once again we find something coming from nothing in that the selection event does not exist (-) until it does. However, unlike the gravitational force of a direct selection, we find that the gravitational force is weak (-, +) for the selection is non-deterministic.

Fig. 5b. Since both selection and its potential are of opposite values, we obtain both right handed and a left handed angular momentums (-, +) thus we have both $+Z$ (spin up) or $-Z$ (spin down) directions, once thought to be a characteristic behavior exclusive to quantum mechanics.

Fig. 6a. Here we combine the positive gravitational force of a direct selection with that of the negative gravitational force of an indirect selection. This gives us a symmetrical attraction of two opposite forces of gravity which mirror that of the two opposite attractive forces of electromagnetism which in turn repel to quadrants I (+, +) and II (-, +) of the inclusion map. We find that electromagnetism is a function of gravity.

Fig. 6b. Here we combine right and left handed angular momentums created by the repel forces of electromagnetism which then gives us the deterministic positive spin value of the strong force as exhibited in quadrant I and the non-deterministic negative spin value of the weak force as exhibited in quadrant II. Thus, we have symmetry of two complementary forces unifying strong force with its weak counterpart. We find that strong and weak forces are a function of electromagnetic gravity.

Fig. 7 Here we combine all four forces with their positive and negative values and find a complete symmetry of opposite forces attracted together by gravity which satisfies the characteristics of a gravitational force which is experienced by all particles. This gives us a dimensionally consistent equation of $\boldsymbol{E} = \boldsymbol{G}^2$, where $\boldsymbol{E}$ is energy and $\boldsymbol{G}$ is gravity squared. As exhibited, we have a strong electromagnetic gravitational force and a weak electromagnetic gravitational force which reconciles gravity with the laws of quantum physics to produce a complete and self-consistent theory of quantum gravity, i.e., the theory of everything [16].

Fig. 4a. Cause - (+) Gravitational Force

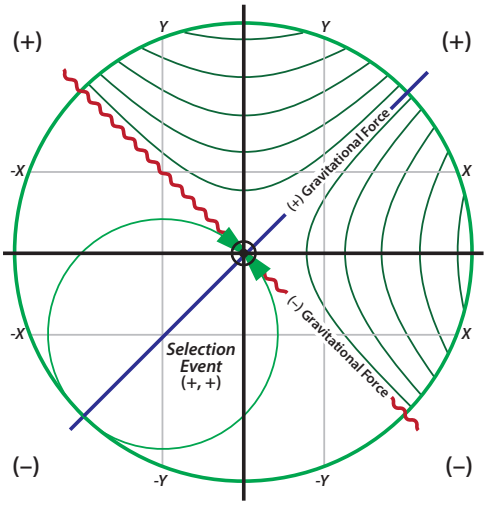


Fig. 4b. Effect - Right Angular Spin

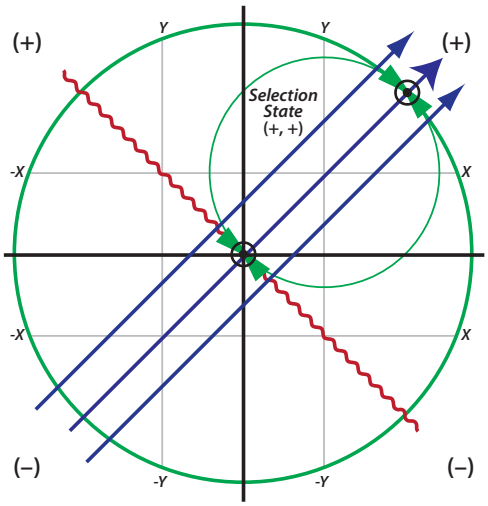


Fig. 5a. Cause - (–) Gravitational Force

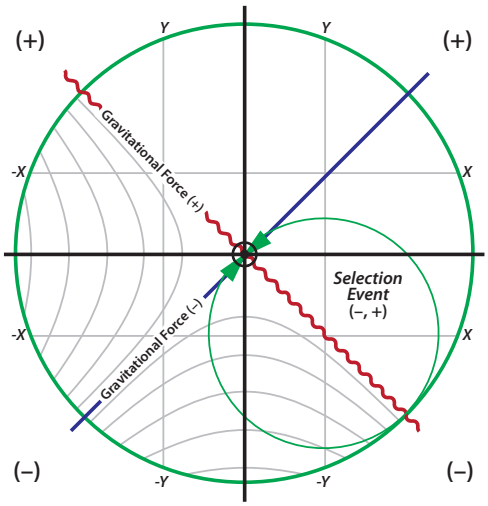


Fig. 5b. Effect - Left Angular Spin

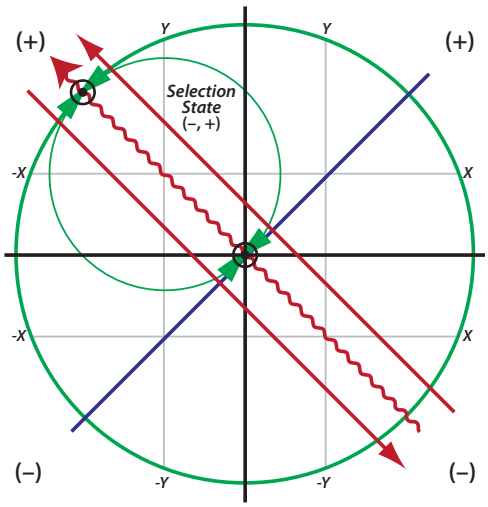


Fig. 6a. Gravitational Force

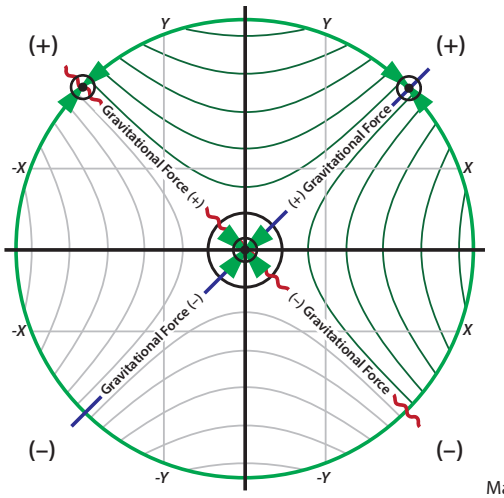


Fig. 6b. Right & Left Angular Spin

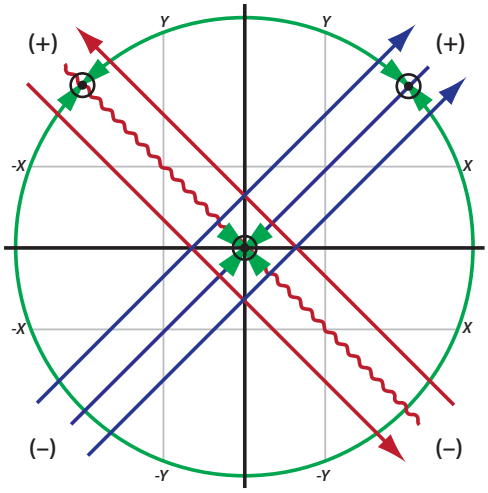


Fig. 7 $E = G^2$, Unification of Gravity with Strong, Weak, and Electromagnetic Forces

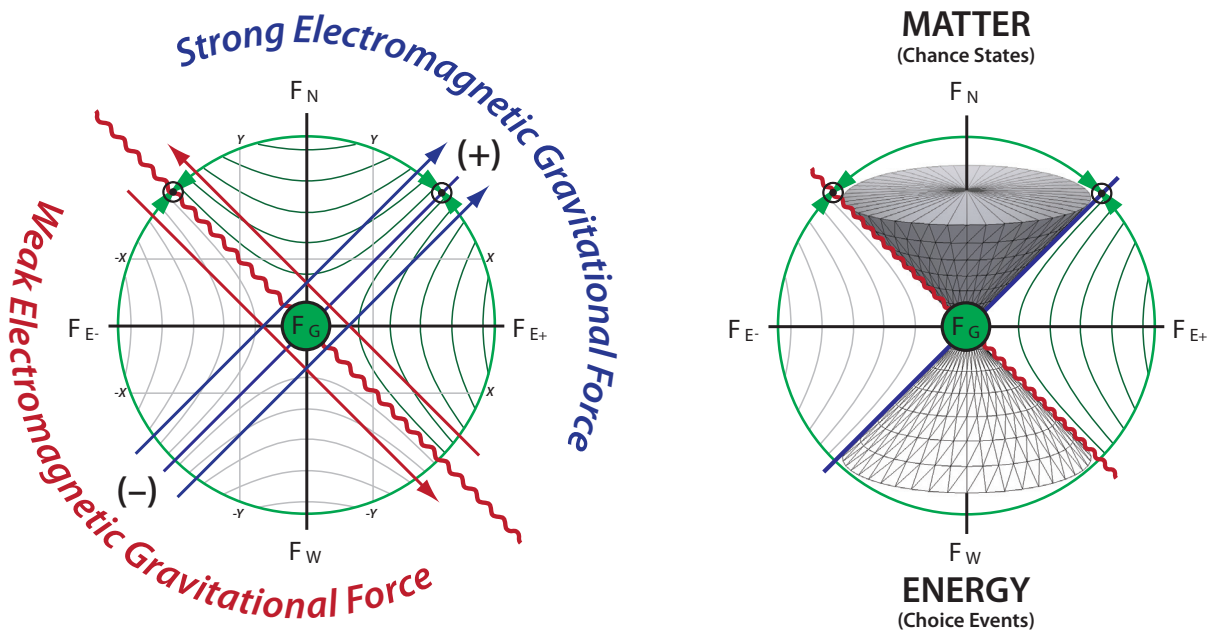
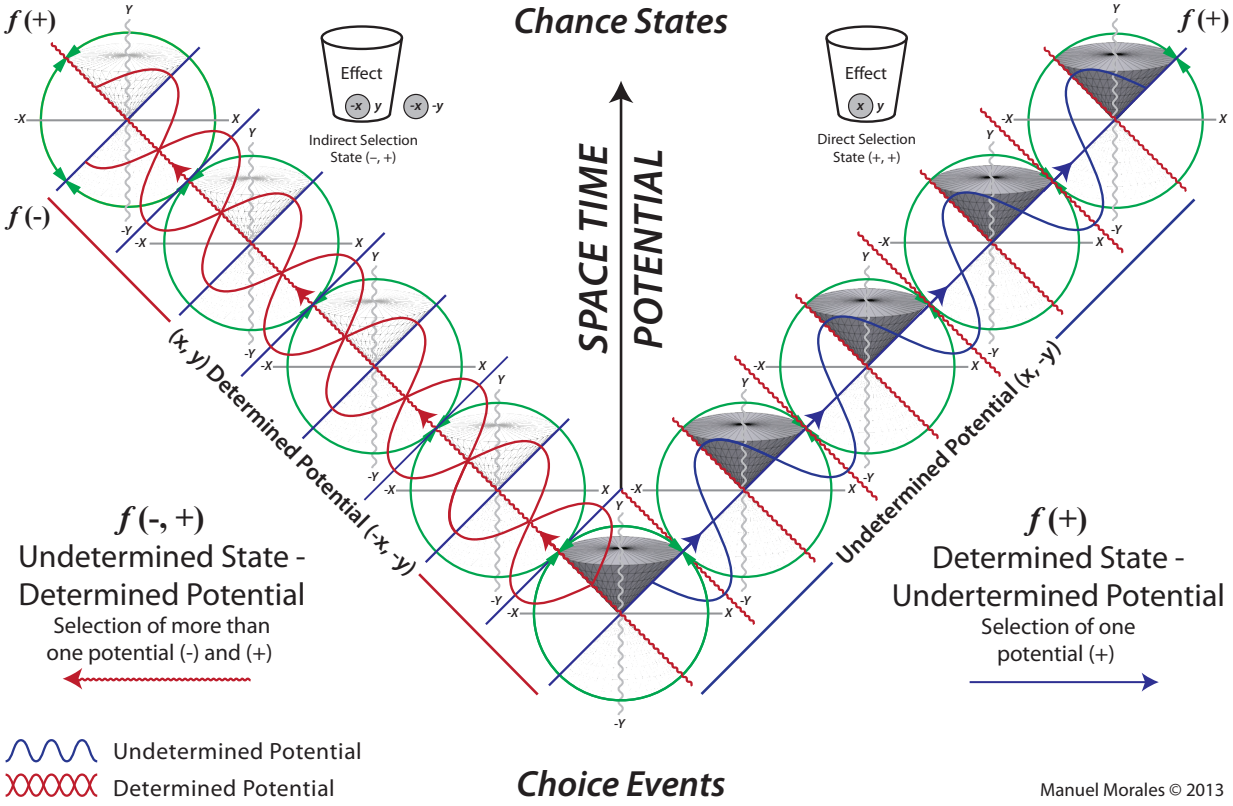


Fig. 8 Absolute Value Function of Selections



Since Choice/Chance Mechanics is a super-deterministic model, an experimenter's decision to measure certain components of spins is predetermined. Thus, we can predict the outcome (determined or undetermined states) of any experiment that *could* be carried out in principle with absolute precision. In the second graph of Fig. 7, we show the causal attributes of the light cone [17] which plays an essential role in defining the concept of causality is compatible with the effectual attributes of the four forces. We show that the *past* light cone consists of energy (selections of potentials) which gravitates towards the center, becomes gravity $\boldsymbol{G^2}$ (set of all selection events), hence, the *future* light cone which receives the position and time of all $\boldsymbol{G^2}$ events (strong, weak, electromagnetic forces) thereby influencing the future states of matter.

Hidden Variables of the Dichotomy of Reality

In Fig. 8 we show the absolute value function of Choice/Chance Mechanics where the two input variables of choice give rise to the two output variables of chance states. In order to understand the underlying correlations between each selection event, we show the $\boldsymbol{X}$, $\boldsymbol{Y}$ coordinates between each event. We also show the potential function as waves Ψ to show the propagation of the potential values throughout the system. When comparing the Ψ function potential with their state function $\boldsymbol{f}$, we find symmetry exist between an undetermined state $\boldsymbol{f}$ **(-, +)** and its determined potential of a destructive Ψ interference of (X, Y) and (-X, -Y), and between a determined state $\boldsymbol{f}$ **(+)** and its undetermined potential of a non-destructive Ψ interference of (X, -Y). We find that the absolute value function of selections $|\boldsymbol{X}|$ gives us determinism of a state as either certain or uncertain, whereas potentials $\boldsymbol{Y}$ gives us *existence and non-existence* of selection events and their states. If, and only if, both *hidden variables* of selection simultaneously exist ($\boldsymbol{Y} = |\boldsymbol{X}|$) do we have what we call the dichotomy of reality. When we perceive states of information as causal entities (bit) instead of effectual entities (it), we blind ourselves to understanding that *selection is a fundamental function of energy*. Thus, we have states of certainty for its potential is uncertain and we have states of uncertainty for its potential is certain, hence, chance states. Therefore, Werner Heisenberg's postulate that 'through quantum mechanics the invalidity of the law of causation is definitively established' has now been falsified for we find that quantum mechanics is a *partial bit* giving us a *partial sense of reality* and thus an incomplete theory as Einstein had predicted nearly a century ago [18].

However, if empirical evidence and causal relationships are not sufficient to settle this debate, we offer another way for the reader to reconcile the findings to his or her satisfaction, if such a thing could be obtained, and that is by conducting the Final Selection Experiment. Let's say that one morning when you first wake up you find yourself absent of the ability to choose. This means you cannot choose to move your body whatsoever. You cannot choose to take in any fluids. You cannot choose to take in any nourishment. You cannot choose to relieve yourself, etc., etc. The outcome is obvious. The effect of a physical system to no longer have the capacity to make direct selections is certain death. The assumption that selection is some sort of option, a freedom of will, is unsubstantiated by the fact that this machine we call choice is how energy works which is a fundamental necessity, not a philosophical option, of our physical existence. We find that we have the ability to choose because we do not have the ability to not choose in order to exist. It would be ill advised to argue with nature by taking on the Final Selection Experiment to see if one's assumptions to the contrary are correct. Nonetheless, my bet is on nature...

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