

Gaging the Neural Path of the Universal Grammar by the Logos Heuristics

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Abstract

The logos heuristics (“Λ”) derived from the fix of autistics—e.g., the strain to tap infinity—can help us gage the Universal Grammar that Charles Sanders Peirce implied in his “Semeiotics” since 1868. Knowledge of that Grammar equates the return of “Quetzal-coatl” in Mesoamerican legends. If that “bird-serpent/sky-land” returned with the Common Sense in Peirce’s “Pragmaticism,” social science would befit the 3rd Attention behind Dharma. In Dharma, the 2nd restores the 1st attention: infinity, finiteness; quantum, classical computing; doubt, certainty; hyperspace, spacetime; flail, crook; yin, yang; mother, father; water, stones; moon, sun; urim, thummim; nagual, tonal; Shiva, Vishnu; novelty, sameness; mindfulness, focused attention; learning, memory; fantasy, reality; unknown, known; simultaneity, sequence; lying, candor; patience, anger; fluidity, bluntness; less-than-perfection, perfection; witch, muggle; imaginary, real numbers; wine, bread; jury, law; flexibility, rigidity; hope, faith; arch, column; bow, arrow; quantum physics, gravity; and pragmatics in cerebellar microcomplexes, grammar in the neocortex. If the return of Common Sense distanced us from the desire to overwin and replace other species, our young will regain the Earth that hosted saber-toothed cats.

Keywords: autism, Universal Grammar, Charles Sanders Peirce, Quetzalcoatl, Common Sense, Pragmaticism, Dharma

1. Introduction

Although science and technology are booming, we have repressed knowledge of Common Sense or Dharma, which invited our Stone-Age ancestors to revere nature and the nature of language. Unless we change now, all human societies will soon die. About 150 years ago, Charles Sanders Peirce (“/pɜːrs/” IPA¹)—an American philosopher, mathematician, and logician—implied that his “*Science of Irony*” could help us change our obtuse ways. In an article (Peirce, 1868, p. 287, § 4), he remarked two momentous propositions: “There is no griffin” and “A griffin is a winged quadruped.”

A gravity-defying “griffin” is made out of a lion and an eagle. I assume that one column of the neocortex (Hawkins, Ahmad, and Cui, 2017) of Peirce’s brain welcomed the representation of the king of land animals—the lion; and another column, the king of sky animals—the eagle. *A quadruped on land is not a bird in the sky! A “griffin” (“lion-eagle”/“land-sky”), then, echoes the infinite speed that allows us to stand on land, in the sky, and in rival concepts simultaneously. It also implies the link between two representations, or “meta-representation” (a scary word).*

High-functioning autistics meta-represent in the finiteness of the first attention; and not in the infinity of the second attention. Contrariwise, nonautistic Down persons handle infinite speed but cannot meta-represent. By defeating both autism and trisomy 21, a griffin reveals the truth of an odd logic in nonautistic humans: The verb “is” in Peirce’s sentence, “A griffin is a winged quadruped,” denotes real mental creativity, which makes the first sentence false. And if the reality of mental creativity were negated, a double negation too would make false the sentence “There is no griffin.”

Together, Peirce’s false first sentence and his true second sentence stress the need and insufficiency of the first attention² impaired in Down syndrome (DS), the wonders of the **second attention/intention** (2) impaired in ASD (Autism Spectrum Disorder), and an irony in the **third attention**, or the Dharma tapped by Peirce’s “Pragmaticism.”

¹ “Peirce” should be pronounced as the word “purse.” The acronym “IPA” reflects the International Phonetic Alphabet.

² In my *printed books*, I use: a) underlining to stress finiteness, classical computing, and the first attention/intention (1); b) **bold** to highlight the infinity of quantum computing and the **second attention/intention** (2); c) their union (or *an irregular initial capital*), to stress the sociality of the Third Attention/Intention (3); d) the colors blue, red, and green for the first, the **second**, and the third attention/intention in any figure; and orange, to mark madness.

I posit that, although Peirce never faced the tragedy of autism, he knew that a Universal Grammar **hides** behind the best **science**. On July 20, 1969, Neil Armstrong could have said, “The griffin has landed!” Behind Armstrong’s **wild walk** on the Moon stood the **rebellious irony** of many **actor-scientists**. There are limits to the freedom of **imagination**, though!

At the end of the play in which he took in the **infinite speed** of Hamlet, an actor has to *cease* (**zero**) **being-and-nonbeing** the Prince of Denmark. If that actor would fall into the **lunacy** that precedes **nothingness**, enter his home dressed as **Hamlet**, and call his love “**Ophelia**,” love would not stop her from sending **him** straight into the nearest **madhouse**. His behavior would not be **ironic**. But the merging of justice and tragedy narrated in **Hamlet is**.

Although Shakespeare died about four centuries ago, his **irony** continues **enriching** his audiences; and so could Peirce’s Irony do, if we grasped the Science behind his mysterious “Semeiotics.” Peirce’s Pragmaticism—or the **science of irony**—implies that any person capable of **remembering** in the first attention, **fantasizing** in the second attention, and **returning** into a **humane finiteness** with the Third Attention can **renew** the world by teaching others how to **read**.

Peirce implied the scientific, mystic, artistic, and philosophical roots of **reading** in his 1968 article; and yet powerful enemies prevented him from fitting the life of a university professor, launching him into poverty. Out of his weirdness, Peirce masked the “Distributed Hierarchy” of the Universal Grammar in his Semiotics with made-up names (e.g., “rheme”). I wonder if he unveiled that **hierarchy** in the writings that his wife Juliette consigned to Harvard University. I do know, however, that *separating Peirce’s “triadic semiotics” from Ferdinand de Saussure’s “dyadic semiology”* (Deledalle, 2000, p. 112, § 2) **will not lead to reading Peirce’s Pragmaticism as the end point of a long story**.

Peirce’s Semiotics agrees with a diagram left in Gorham’s Cave at Gibraltar (top left in figure 1)—around 37 000 BCE (Before the Common Era)—and the Wisdom of Osiris/Hatshepsut, Yu the Great, Moses, the Buddha, and Quetzalcoatl.



Figure 1. From Gorham’s Cave at Gibraltar to Egypt, China, the Middle East, India, and America

In Gorham’s **symbolic artwork** (Rodríguez-Vidal et al., 2014): **Quantum coherence** (2) crosses the present and past of Moses’ “**Thummim**,” in the classical computing of spacetime (1); and below it, **quantum decoherence** (3) touches present and future, before crossing a **bow** (Moses’ “**Urim**”) in the quantum computing of hyperspace (2).

Loading a bow makes Moses’ “**Urim**,” the going of the Mesoamerican demigod “**Coatl-quetzal**” (“snake-bird”) into infinity within quantum coherence, and **tensing** the chords of a guitar. And **unloading a bow** matches decoherence, Andrés Segovia’s **playing** Francisco Tárrega’s “*Memories of the Alhambra*,” the **return** of “**Quetzal-coatl**” (“Bird-snake”) from Venus, and Peirce’s **science of irony** in the Third Point through which Science meets Religion, Art, Philosophy, Music, Language, and nature’s Nature. As with the backbreaking geniality of Yu the Great, Moses’ heart, and the lovingkindness of the Buddha, the Third Point will help us use infinity in **tensing** our mental bow to **boost** Progress, instead of destroying others.

From Gorham’s Cave, the **humane union (3)** of **quantum (2)** with **classical (1)** computing backed the Third Point of:

- The **artists** that built Giza’s epic cat and decorated Bhimbetka’s caves (Northern India) around 7000 BCE;
- the **Yellow Emperor** in 3000 BCE, **Osiris** in 2500 BCE (Cassella, 2018d), and **Yu the Great** in 2100 BCE;
- **Moses**, in the Wisdom received by **King Solomon** and the **Queen of Sheba** in the 10th century BCE;
- **Laozi/Confucius** (China) and the advocates of the **Trimurti** (India) at the turn of the 6th century BCE;
- the Buddha/“**Tathāgata**” (“Thus-gone-and-come”), who spread his **loving-kindness** in the 5th century BCE;
- **Muhammad**, when he undertook his “**Al-Isrā**” and “**Wal-Mi’rāi**” travels around 621 CE (Common Era);
- **Charles Sanders Peirce** about 15 decades ago, when he implied the **nature** of the Universal Grammar; and
- **Gandhi** for his “**Swarāi**” (“self-rule”) in a world enriched by **wise leaders** (e.g., Osiris/Hatshepsut, figure 1).

That **union** will also back the return of “**Quetzal-coatl**” (“Bird-serpent”) from Venus to Earth through **quantum decoherence** (at the right of figure 2), with the blessing of “Tonantzin,”³ the “Evening Star,” and long-term depression (**LTD**, in figure 2).⁴

While it may seem useless, illogical, or sinful, “**recreation/musement**” (2) (Cooke, 2018) *precedes Progress* (3).

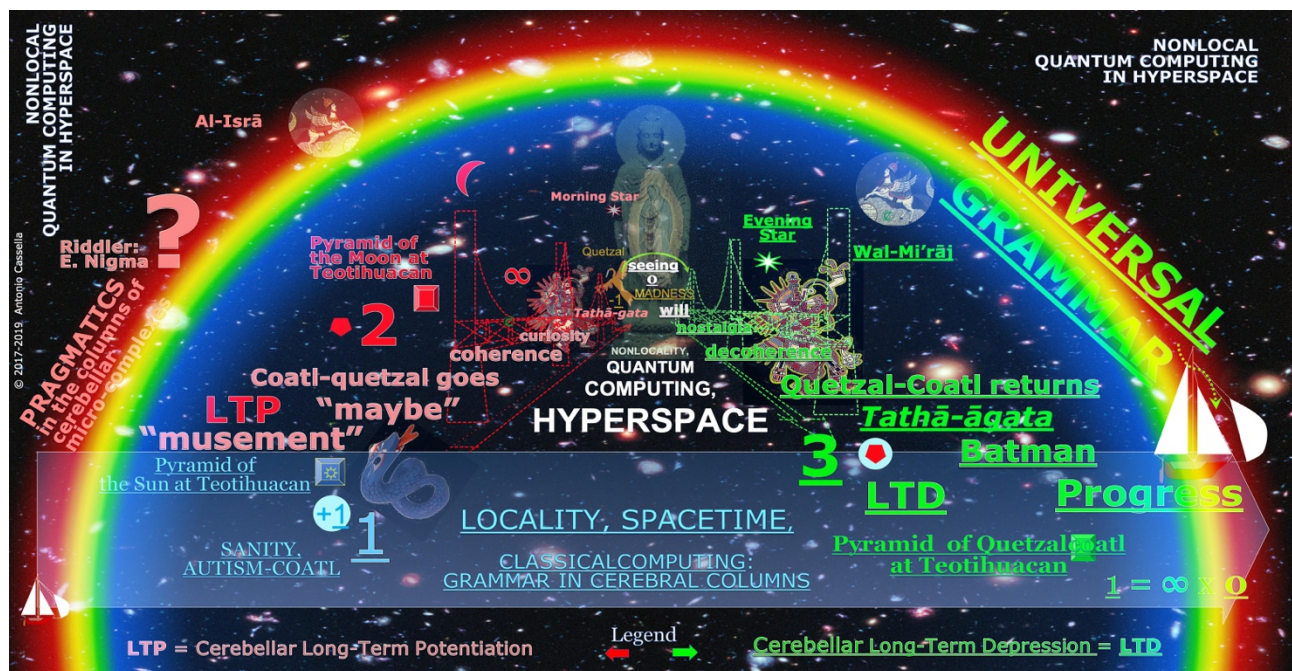


Figure 2. The going of “Coatl-quetzal” (2) and the return of “Quetzal-coatl” (3) within Progress

Gandhi’s “**Swarāi**” evokes the Third Attention, Progress, the **Tathāgata-Buddha**, and **Quetzalcoatl** in two steps: a) **going** from **classical finiteness** into **quantum infinity** with the moon and the morning star (Venus) or **LTP** (long-term potentiation, left of figure 2), before b) **returning** to **finiteness** on Earth with the **Evening Star (LTD)**, at the right).

The **social mind** of Gandhi, the Buddha, and Quetzalcoatl has guided my scientific exploration of humans’ cognitive development (Cassella, 1997, 2000, 2011); global warming (Cassella, 2017a); art (Cassella, 2017b); math (Cassella, 2018a); the bridge between psychology and neuroscience (Cassella 2018b); Sacred Texts (Cassella, 2019a); the link between **gravity and quantum physics** (Cassella, 2019b); and the Universal Grammar behind Peirce’s ironic **reading**.

Here, I extend Peirce’s invitation to **read** to **readers** who deny the influence of **infinity** in **finiteness**—within the infinite speed unleashed by a **griffin** or by a piece of information that **connects instantaneously** two separate pieces of a whole through quantum entanglement and the two slits of a double-slit plate (Feynman, 1985; Icke, 1995; Lloyd, 2006).

³ As with “Kali, Saraswati, Lakshmi, and Parvati” (India), “Tonantzin” reflects the Goddess Mother (among the Aztecs).

⁴ “Quetzalcoatl” makes the Olmec-Maya-Aztec symbol for gaining the Third Point and the **power** to control **power**, which Gandhi deployed by reducing his needs and by enlarging his support to the eventual **return** of Common Sense.

My search for the Science behind **irony** and the neural roots of the “**universal grammar**” aligns with four hypotheses:

- a) The **union** of perfect repetition (the finite Thummim-Tonal-grammar in the 1st attention) with **less-than-perfect coherence** (the infinite Urim-Nagual-pragmatics in the second attention) heralds **decoherence** in the Universal Grammar (the Toltec/Mexica Eagle of the Third Attention and Neil Armstrong’s ship, “The Eagle”);
- b) autistics cannot **go** (2 in figure 2) with **LTP** (cerebellar long-term potentiation) into the less-than-perfect infinity of **hyperspace** (Caramazza, 1994), toward the lunacy of unreality, with the **Nagual** “Coatl-quetzal” (“Snake-bird”) and the **moon/Morning-Star/second-attention**;
- c) unmedicated schizophrenics cannot **return** (3 in figure 2) with **LTD** (cerebellar long-term depression) from the **zero** near unreality to the finiteness of shared reality through the **Evening-Star/third-attention**; and
- d) **scientific knowledge** of the relationship between LTP and LTD (e.g., in using correctly personal pronouns) will help us **regain** our Third Point and Common Sense, turning the inertia of total defeat into viable Progress.

My journey through the sanity of autistics and the insanity of schizophrenics has deepened the implications of the paradoxical principles of **quantum computing** (Cassella, 2018c, 2018d, 2018e, 2019a). I **compared** finite speed in general relativity with **infinite speed** in quantum physics (Cassella, 2019b) because the finite world in which being opposes nonbeing and the infinite **world** in which being embraces nonbeing **can be complementary** within Progress.

I described in that article (Cassella, 2019b) the “logos heuristics” (“A”), by which . . .

- *the quantum-computing principles of ubiquity*, “**An object can exist in separate places simultaneously**” (akin to the **infinite speed** of quantum entanglement [Feynman, 1985]) *and coincidence*, “**Separate objects can share the same space at the same time**” (analogous to quantum superposition [Icke, 1995]) *readjust* . . .
- . . . *the classical-computing principles of locality*, “**An object cannot exist in separate places simultaneously**” (related to Einstein’s relativity of simultaneity) *and impenetrability*, “**Separate objects cannot share the same space at the same time**” (similar to Pauli Exclusion).

The four principles hide behind my father’s **figurative explanation** about why *moving in unison* allowed him and his comrades-at-arms to return home safe after World War II: “My platoon **survived** because we were a *shoal of sardines*.”

He said that the 18 members of his platoon **stood simultaneously** on land and in the sea (the principle of Ubiquity, or infinity); also, that 18 soldiers and 18 sardines **shared the same space at the same time** (the principle of Coincidence, **zero**, or **nothingness**).

However, I realized that humans and fish live in separate worlds (the principle of Locality) and that 18 sardines never entered the bodies of 18 soldiers (the principle of Impenetrability). The **invisibility** of metaphorical hyperspace (∞ , or **infinity**) in the mind of my father **readjusted elegantly** (“**0**”) the visibility (“**1**”) of spacetime—as in, “ $\infty \times \mathbf{0} = \mathbf{1}$.”⁵

The strain of autistics to grasp **figures of speech** suggests that *infinite-speed and nothingness in quantum computing* *readjust* *finite-speed and matter-form in classical computing* through the Universal Grammar that stirs the social mind and the cosmos. Recall Peirce’s examples (1868, § 4) about “There is no griffin” and “A griffin is a winged quadruped.” Within **coherence**, a griffin invites **curious readers** to stand simultaneously (**ubiquity**) on the earth and in the sky.

We can also attribute to coherence the fact that a lion and an eagle **share the same space at the same time in a griffin**. Yet, only **accepting** as an **irony** the alleged inexistence of a griffin compels **readers** to **decohere** into a cosmos filled with **renovated** sanity and **hope**. The search for **quantum gravity** is not ironic.

Here, I use the **ironic ideas** of Charles Sanders Peirce, the limited interpretation of his Semiotics by Charles W. Morris (Padrón, 1996), and the logos heuristics in **gaging** the Universal Grammar behind humane intersubjectivity. I found that most readers **read** exciting texts “without **reading**” them. If we do not regain our individual Third Point, Common Sense, and the **sociality** behind the Universal Grammar that allows us to **read**, we will force a hellish “text” on children abandoned into a chaotic environment: “*Leave behind any hope, you who enter*” (Alighieri, 1555, Inferno, Canto III).⁶

2. Method

The problems studied in the Background, the explanations examined in the Discussion, and the results I offer here may create more problems. In this article about the neuropsychological roots of the Universal Grammar, I appeal to the understanding of readers without using equations. I just equate the identity, “**infinity by nothingness = unity**” (or “ $\infty \times \mathbf{0} = \mathbf{1}$ ”) to the Distributed Organization of the Universal Grammar.

⁵ Dividing 1 dollar by 100 gives 1 cent; 1 dollar divided by 10^6 gives 1 millionth; and 1 dollar divided **infinity** gives **0**.

⁶ My translation from ancient Tuscan dialect/Italian.

3. Results

I conclude here that:

1. The finite “being” and “speed” (“1”) of arbitrary physical means, syntax rules, and prototypical meanings in any language—or the particular grammar behind our first attention/intention—resides in our cerebral cortex ([+1] or the Pyramid of the Sun in figure 2); and the world of chaotic “nonbeing” (the bird of lunacy/madness [-1] kicked by “Tonantzin”/“The Virgin of Guadalupe” at the center of figure 2), in denying copies stored in our cerebellar cortex;
2. **pragmatics**, within the coherence of quantum divergence and *infinite speed* (“∞”), concurs with **nonlocal long-term potentiation (LTP)** (“Coatl-quetzal goes,” or [2] in figure 2), the **joint attention** by which a one-year-old girl points to the “**tree of the knowledge of good and evil**” with her index finger and the **second attention** nonlocalized in the columns of her cerebellar microcomplexes;
3. finally, the Third Attention, or the Universal Grammar, starts with decoherence (“0”) in **long-term depression (LTD)** (“Quetzal-coatl returns”) and ends with our forebrain-back-of-brain **laughs** after we **get a pun** (3 in figure 2), or become aware of the divine reality of the Tree-of-Life and of any **irony**.

The previous results may lead to social artificial extensions, capable of translating appropriately figures of speech, ironies, and puns. Still, we will not be able to build an ironical artificial **interpreter** without getting the **social implications** of the Universal Grammar, the Tree-of-Life, or the identity “∞ x 0 = 1” behind all languages.

4. Background

The melting of methyl clathrates from seeps of deep gas at the bottom of some seas and the thawing of organic material in the permafrost could disturb the tipping point of the Arctic as a carbon sink. At 1000 ppm of carbon dioxide (CO₂) in the atmosphere, the chemocline that separates sulphur-fed from oxygen-fed bacteria in our seas would start rising (Ward, 2006). If that feedback occurred, vast amounts of methane, CO₂, and hydrogen sulfide (H₂S) would enter Earth’s atmosphere—a fact that would intensify global warming, shock the ozone layer, and kill most species and us too early.

The sterile obedience of brainwashed cadres will prove unable to seize the challenges imposed by global warming, plunging us too into the ongoing 6th extinction (Cassella, 2017a, 2018c, 2018e). Knowledge of the **thought** impaired in autism, however, *can help us evade the horror that would beseech our children*. Indeed, “Con-science” of the Science behind **humane irony** and the Universal Grammar could swap a karma of chaos for a **dharma of progress**.

4.1 The One and the Many from Charles Sanders Peirce and Ferdinand de Saussure to Heraclitus

By considering the Irony of uniting mutually exclusive relationships—as in “There is no griffin,” and “A griffin is a winged quadruped” (Peirce, 1868, p. 287, § 4)—**infinity** and **nothingness** in Charles Sanders Peirce’s **pragmaticism** (Peirce, 1905, p. 483 and p. 492) can help us **reinterpret** the **union** of Darwinian **need with chance**.

Peirce hoped that the scientific base of Pragmaticism would side with God’s inscrutability in protecting creators from adverse events (Peirce, 1908, 5th section, 2nd §). He implied the existence of **infinite speed** and **infinite divisibility** (Sfendoni-Mentzou, 2006, p. 269) in social minds, whereas the “semiology” launched by Ferdinand de Saussure never **harmonized** the **infinity** that stirs an artless talk with the finiteness behind the dull words and rules of any language.

In the early 20th century, students’ notes from the Swiss Ferdinand de Saussure agreed with the aims of “semiosis,” in which any language (“langue” in French) uses arbitrary clusters of physical means (“paroles”) associated to meanings (“idées”) within a particular syntax. Because he studied Homer’s Greek and ancient Sanskrit, de Saussure may have known about the grammar writings of the Hindu Pāṇini (5th century BCE) and the Greek Dionysius Thrax (2nd century BCE). I assume that his limited contribution to the exploration of the Universal Grammar never went beyond the combination of the “syntagmatic” chain of words by which a *horse* asks the barman of a Western saloon for a double whisky; and tells its *rider* that he can have only a glass of milk (paradigmatic substitution), because “he has to drive.”

Although Roger Bacon did not match Arthur Köestler (1964) in recognizing the paradoxical principles behind a **joke**, in the Middle Ages Doctor Mirabilis acknowledged that a unique **philosopher’s stone** underlies human discourse. In fact, he wrote that, “*Under the substance of any language lies one and the same grammar, although it may vary by accident*” (Hovhauden, 1990, p. 123).⁷

Saint John’s verse, “in the beginning was the Word (Logos), and the Word was with God, and the Word was God” (John 1:1, KJV) goes deeper: The uniplural **nature** of human languages “walks with” the **nature** of God.

The Greek philosopher Plato (Hamilton and Cairns, 1961) preceded Peirce, Roger Bacon, and Saint John in highlighting in the 4th century BCE the **union** of rigid **being** with flexible **being-and-nonbeing**. In all dialogues by Plato, but

⁷ My translation from Latin; and my **combination** of underlying with **bold**.

Parmenides, Socrates uses his “**irony**” (coherence in the second attention) to discredit the knowledge of his interlocutors; and his “**maieutics**” (decoherence in the Third Attention), to rebuild it—without undermining the rigid Parmenidean perfection attached to unchanging ideas (the first attention).

In Plato’s *Parmenides*, however, an old and fictional Parmenides travels from Italy to Athens to teach a young Socrates about the **flexibility** of **less-than-perfection**—in which “**unity joins plurality, like joins the unlike, and “being joins nonbeing**”. That **view**, at once **doubting** and **hopeful**, would have been anathema to the real Parmenides.

One century before Plato, the real Parmenides praised the immortality of an invariant being (figure 3, central band, +1 opposed to -1 in the first attention) when he wrote, “To understand and to say must be being; being exists, nothing is not” (Cerri, 1999).⁸ Parmenides criticized the slightly older philosopher Heraclitus for writing, “**The way up and the way down are one and the same thing**” (Cappelletti, 1972).⁹ Actually, Parmenides wrote, “People with two heads; . . . who think that **being and nonbeing are and are not the same thing**” (Cerri, 1999).¹⁰

Beyond the rigor of Parmenides, Heraclitus and Plato **realized** that we may **unite ill-assorted meanings** (e.g., in **puns** and **the upper part** of figure 3)—in order to **win with** whomever we **laugh with** or **cry with** (3).

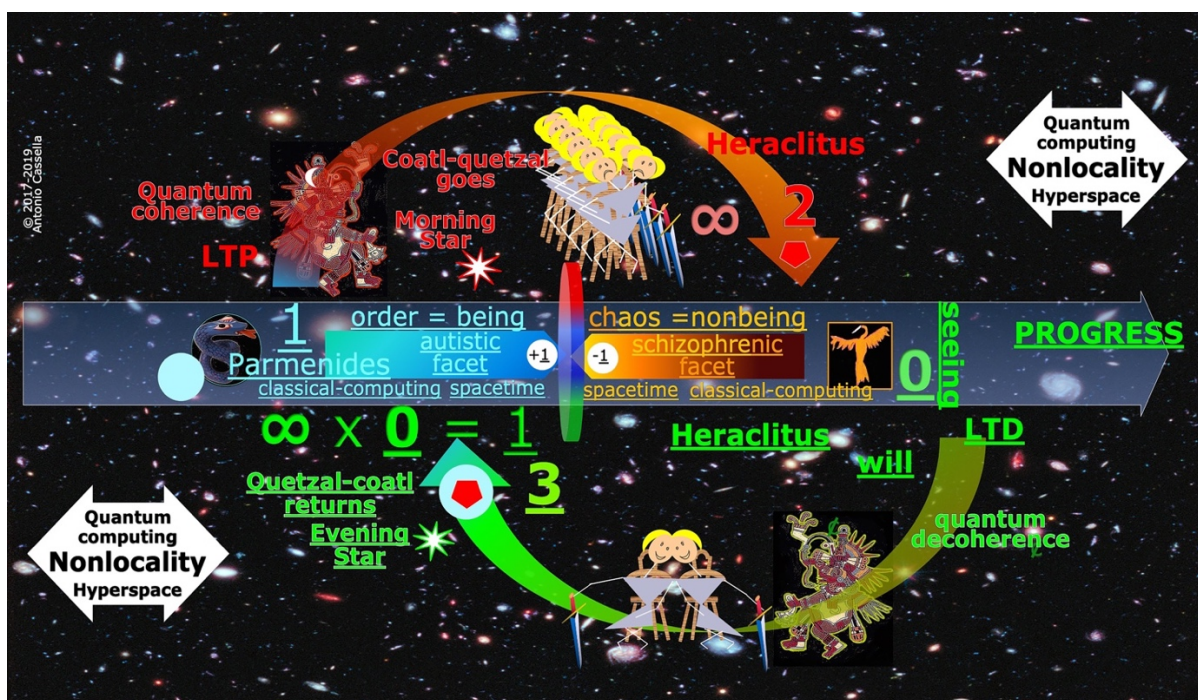


Figure 3. Parmenides’ being-opposed-to-nonbeing (+1 and -1) and the coherence-decoherence (2 and 3) of Heraclitus

In order to **read, laugh and cry with others**, or **convince others**, we **need both** the autistic facet of Parmenides and the artistic facet of Heraclitus, classical rigidity and **quantum flexibility**, bread and wine, perfection and **less-than-perfection**, literal and esoteric reading, finite and infinite speed, or rigid grammar **and** flexible **pragmatics**.

4.2 Social Interaction and the Name of God

A millennium before Heraclitus and Parmenides, the *Pentateuch* authored by Moses (Katznelson, 1991) included a dialogue between that author and God (Exodus 3:13, KJV):

“. . . The cry of the children of Israel is come unto Me: . . . Come now therefore, and I will send thee unto Pharaoh, that thou mayest bring forth the children of Israel out of Egypt” . . . And Moses said unto God, “Behold, when I come unto the children of Israel, and I shall say unto them, ‘The God of your fathers hath sent me unto you’; and they shall say to me, ‘What is His name?’ what shall I say unto them?”. . . And He said, “*Thus shalt thou say unto the children of Israel, ‘I Am’ hath sent me unto you.*”

⁸ My translation from Italian.
⁹ My translation from Spanish.
¹⁰ My translation from Italian.

Since any person calls himself/herself “I Am,” the name “I Am” (Cassella, 2018c) stands for the name of God and for any **social interaction** between the self and the other. In any **intersubjective discourse**, two socially-minded “I am” **enrich** each other by **taking the place of the other**—without moving from where they “are”—in a **divine combination** of **infinite** and **finite** speed.

God’s words to Moses explain the success of the Italian 1938-song “*Un’ora sola ti vorrei*,” written by Umberto Bertini with music by Pacia Marchetti. In the verses, “Un’ora sola ti vorrei, per dirti quello che non sai . . .” (“If I had just one hour with you, *I would tell you what you do not know*”¹¹), this song implies that in a short time (one hour, for example) **any “I Am” might enrich the knowledge of another “I Am.”**

The **power** envisioned by God, Moses, and Bertini’s/Marchetti’s popular song is depicted in the “Johari window.”

4.3 The Self and the Other in the Johari Window

In 1992, Joseph Luft explained to me in Colorado the implications of the four panes of the **Johari window** (figure 4) that he and Harrington Ingham had devised in the mid ‘50s. As shown by the two left windows of figure 4, there is an “I am” pane, in which the knowledge of the self is transparent to others as well. Likewise, we all guard a pane unknown to others; a pane in which others know something of us that we do not know; and a pane unknown to the self and the other.

In any Johari window, **mutual trust** leads the “I am” of two interlocutors to **grow** (stage 3 in figure 4). That said, *the philosophical, psychological, and neural path by which we jump from stage 1 to stage 3 in the Johari metaphorical window remains enigmatic.*

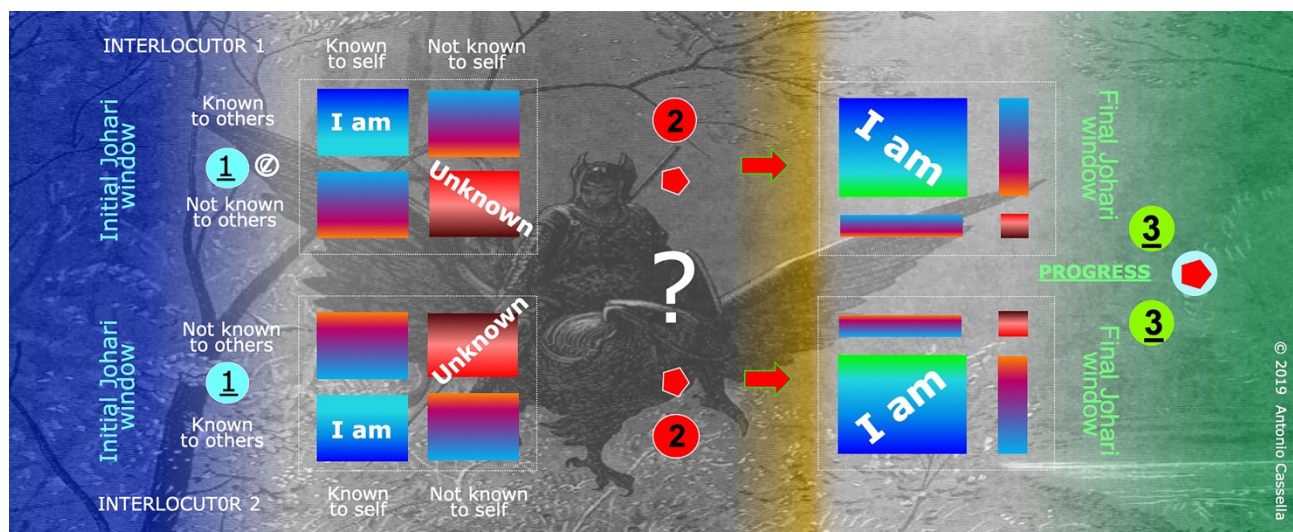


Figure 4. The self and the other in the Johari window

We may crack the enigma of the road to Progress in the Johari window by considering that most philosophies (Cooper, 1996; Ricoeur, 1991) imply Noah Chomsky’s proposition (Lyons, 1978) that our minds retain the genetic effects of an unknown **universal organization** behind the natural intersubjectivity that enriches the self and the other.

4.5 The Concept of a Universal Grammar in Noah Chomsky, Charles Sanders Peirce, and Charles W. Morris

To explain Chomsky’s point, consider a nonautistic preschooler who uses a vocabulary of only 90 meanings. Choosing among 90 different permutations responds to the factorial of 90, or the number 15 followed by 137 zeroes (Cassella, 2018c). The fact that nonautistics may give an opinion by choosing naturally their words among a vast number of competing alternatives truly reflects a cognitive miracle. *Misinterpretation, however, is always possible!*

His initial choice of an ill-suited example about the practical effects of humans’ creativity, for instance, places Peirce as the founder of American **pragmatism**, with William James and John Dewey. Still, Peirce aimed at **something** deeper than using **hands-on schemes** (e.g., saddles, plows, guns, etc.) in exploiting the world (Peirce, 1908, section V, 6th §).

In time (Peirce, 1905, p. 483 and p. 492), his Third Point led Peirce to use the word “**pragmaticism**” to highlight the **social impulse** hidden in the works he wrote in the **isolation** of his dwelling. Peirce realized that **hope** and **humility** can lead the “implicit self” **beyond** Cartesian **doubt**. Peirce’s work implies that behind Descartes’ “I think, therefore I am”

¹¹ My translation.

(Parmenides' being) "lies" a **liar** who "**is and is not**" (the griffin in figure 4) before **landing** into a better self-other. That is akin to the **wisdom** of King Solomon, who **lied** in **giving** an infant to his **true mother** (1 Kings 3:16-28, KJV).

Charles W. Morris, heavily influenced by behaviorism (Deledalle, 2000, pp. 115-118), structured Peirce's pragmaticism in an incomplete semiotics, which underscored nevertheless the essentiality of two components of creative discourse (Padrón, 1996): rigid rules (grammar) and their flexible use (**pragmatics**).

In researching pragmaticism and semiotics in 1998-2000, I took José Padrón's offer at Caracas's UNESR (Universidad Nacional Experimental Simón Rodríguez) to add a qualitative drive to the research I had undertaken in Cambridge (MA) with Alfonso Caramazza (Harvard University) and Helen Tager-Flusberg (U-Mass then; and Boston University now). I will recap here and now the major steps of my research at Harvard and UNESR (Cassella, 1997, 2000, 2011).

4.6 *The Damage to the Alliance of the Like with the Unlike in Autism*

Within my quantitative search, in the summer of 1996, I examined a group of 18 subjects (16 autistics and two geniuses). Helen Tager-Flusberg introduced a task (*False Belief*) in which my subjects had to choose a false over a true belief. Doing that implies **mastering quantum meta-representation**, which is equivalent to **choosing** after **seeing simultaneously** the two sides of a coin or **mounting a griffin**. I introduced *Proper Self*—out of an unpublished protocol (at the moment) provided by Daniel Povinelli (Povinelli, Landau, and Perilloux, 1996). In *Proper Self*, my subjects had to spot the invariance of their self over time (classical meta-representation as a finite link between two known concepts, which Down subjects cannot handle).

Because they could not meta-represent, my intellectually disabled¹² autistics failed *False Belief* and *Proper Self*; the genial subjects passed both tasks; and my high-functioning autistics failed **False Belief** as expected (Baron-Cohen, 1995). Their passing *Proper Self* (Cassella, 1997),¹³ though, demonstrates the need and insufficiency of the first attention. *As any griffin shows, classical supports quantum meta-representation only in nonautistic subjects.*

My qualitative research at UNESR (Cassella, 2000) led to **understanding** why *nonretarded autistic adults trail normal four-month-olds in shifting their attention between opposite stimuli* (Courchesne et al., 1994; Johnson, 1995). Later, the work of Landry and Bryson (2004) aligned with my hypothesis that autistics lack the neural **capacity** to tackle infinite speed in the **shifts of attention** attached to doubting. However, autistics' anchoring in alleged truth might result advantageous in tasks in which there is no spurious **doubting**. One example is "Zaitchik's Photo Task" (Zaitchik, 1990).

In the early 2000s, I realized through Perner (1991) that **infinite speed** forces normal subjects to trail autistics in tasks in which finite speed is the only passenger of the ship of knowledge. In Zaitchik's Photo task about the invariance of the other, autistics beat nonautistics in remembering who was lying on a mat when a picture was taken of their situation.¹⁴

Figure 5 sums up the results of my attempts (Cassella, 2000) to **harmonize infinite** with finite speed by **crossing** my qualitative **search** at UNESR with the quantitative **search** that I had performed at Harvard University. The union of the two searches told me that autistics *cannot follow simultaneously* their "I am" and the different "I am" of others. They cannot deal with the word "**maybe**," in which the "no" of nonbeing (i.e., a false belief) **embraces** the "yes" of being.

In essence, autistics cannot **mount a griffin** in leaving spacetime (1) and **going** (2) into **hyperspace** through diverging **quantum coherence** (upper arrow in figure 5) with the Mesoamerican demigod "**Coatl-quetzal**" ("snake-bird," or "being-and-nonbeing"); and unmedicated schizophrenics cannot **return** to a **renovated shared world** (the lower arrow in figure 5) with "Quetzal-coatl."

At this point, I wish to recall that Piaget (Piaget, 1983; Cassella, 2000, 2018c) found that normal children pass . . .

- a) the first month of life, to assimilate the perfection related to *proprioception in the movements of the self*;
- b) the following three months, *to link one sensation to proprioceptive movements*;
- c) the eight months before the first birthday, *to hook two sensations to the self*;
- d) the year before the second birthday, *to link the self to a representation*; and
- e) the five years before age 7.5, *to bond at least two signs to the self*, or the wicked meta-representation.¹⁵

¹² Intellectual disability, a euphemism for "mental retardation," is taken here as the inability to complete Piaget's revisited five-stage scale, up to age 6.5 years.

¹³ According to Povinelli, my application of the Proper-Self protocol to autistic subjects in 1996 fed a pioneering effort.

¹⁴ The Proper-Self protocol can be examined at Researchautism.com. *Down subjects will fail Proper Self and Zaitchik.*

¹⁵ Although Piaget set the onset of meta-representation before age 7.5 years, all normal children meta-represent before the age of 6.5 years.

Piaget missed the “is” of **quantum coherence**.¹⁶ Hence, he also missed the need to **defeat graciously** the wants of a self destined to age and die. Gretchen, the beauty deceived by Doktor Faust after he signed with his blood a pact with the devil, becomes **mad**; while Faust is saved after **repenting** (von Goethe, 1832-2014).

Johann Wolfgang von Goethe’s scheme agrees with science and mysticism, since schizophrenia does not hit old people; and sincere repentance holds the key to Paradise.

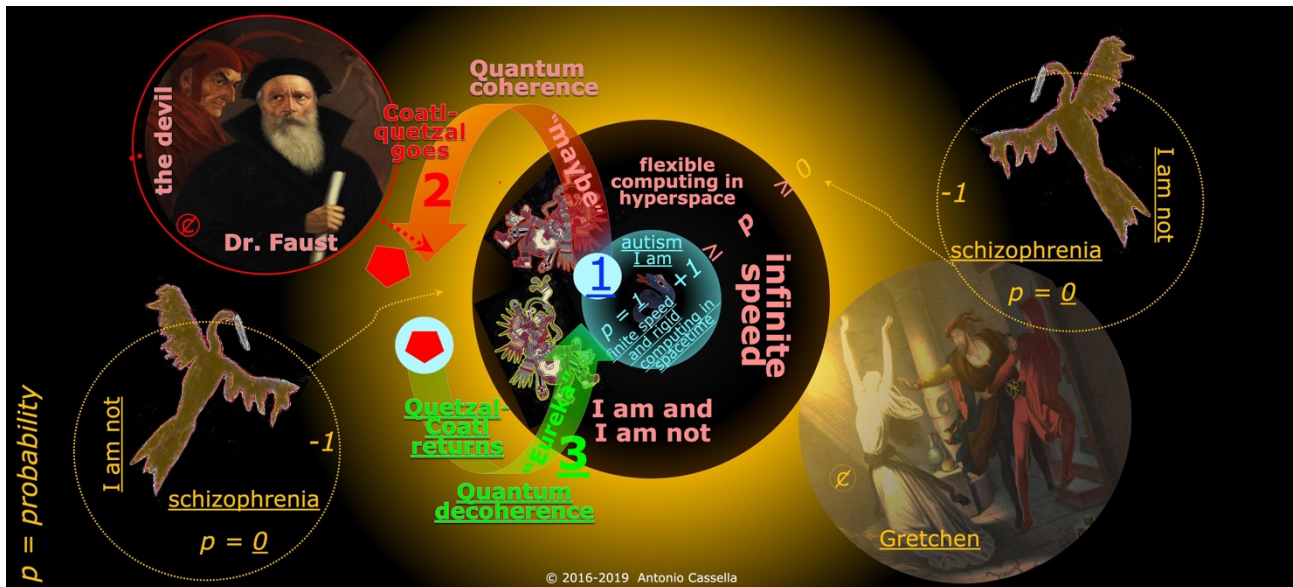


Figure 5. The classical world of “I am” (center), “I am not” (the yellow halo), **and** the world of “I am and I am not”

4.7 Overcoming Temptation and Madness in Intersubjective Bouts

Beyond the softness of von Goethe, within the logos heuristics, I follow Yu the Great, Moses, King Solomon, Laozi-Confucius, Lord Krishna, the Buddha, Christ, Quetzalcoatl, and Muhammad about the need to derail **temptation** in us (2). The **devils** that *brainwash others into accepting their undeserved authority* will join Gretchen in hugging their own “I am not” (the outer circle). They will never **return** to a better world (3 in figure 6)—unless they **repent!**

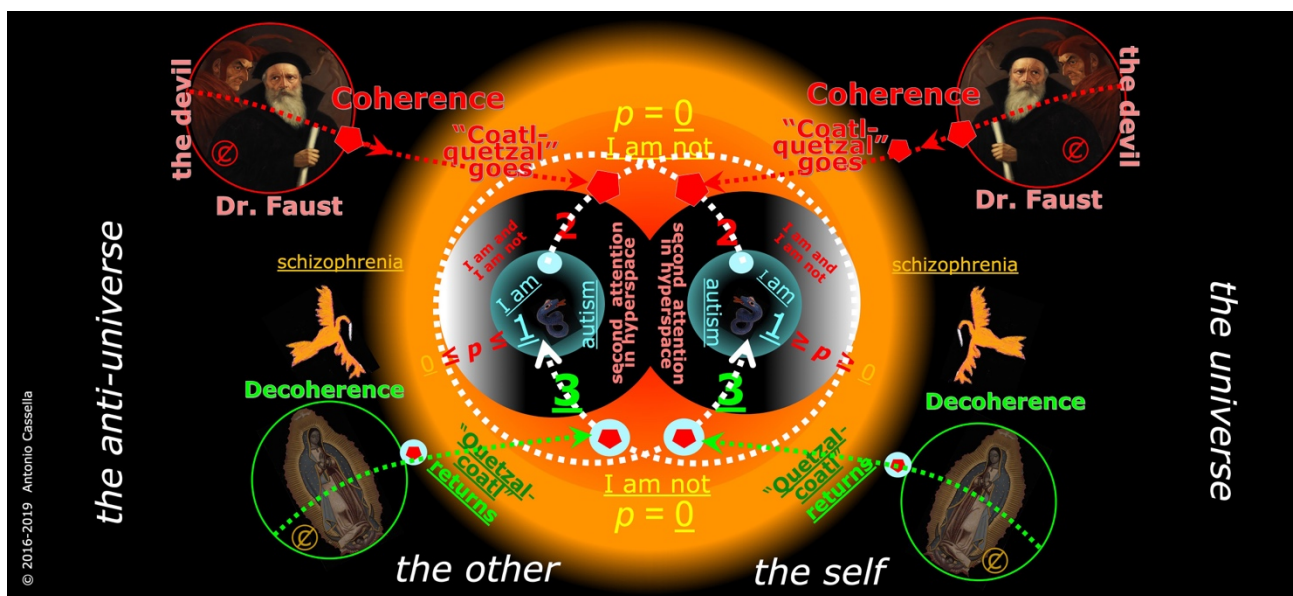


Figure 6. The meeting of the self and the other in the hyperspace of a spontaneous dialogue

¹⁶ In teaching **social talk** to an autistic person, one has to introduce quantum computing into Piaget’s classical scale.

Mentally blind readers cannot see the **cross** that unites quantum **coherence** (2 in figure 7), quantum **decoherence** (3), the **principles of classical computing** (left in figure 7), and the **principles of quantum computing** (right in figure 7).

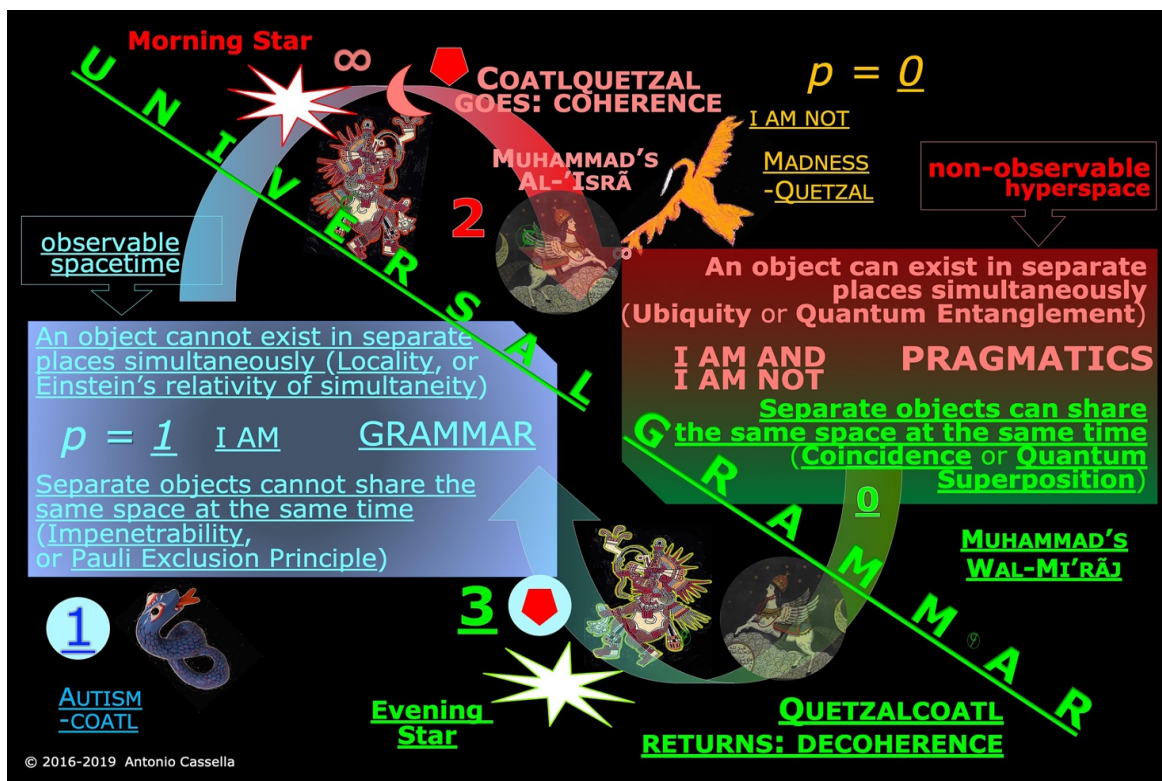


Figure 7. The principles of the logos heuristics

Dr. Deborah Zaitchik told me in 2001 that the principles impaired in autistics contradict the principles spared in them. If Muhammad’s winged horse “Buraq” were considered a metaphor for the infinite speed of neural quantum computing, however, the meaning of his going (the top arrow and Al-’Isrā in figure 7) and of his returning flight (the bottom arrow and Wal-Mi’rāj), in just one night, would soar in the mind of readers whose Common Sense and Third Point wake up from the comfortable bed of truth opposed to falsity set by the finite speed of classical computing.

5. Discussion

The aim of the Discussion section is to arrive at the neurological implications of autistics’ loss of the pragmatic capacity for entering the one-way bridge of quantum coherence (the upper arrow in figure 7 or Muhammad’s Al-’Isrā) and of schizophrenics’ difficulty to cross the bridge of quantum decoherence (the lower arrow or Wal-Mi’rāj).

In my aim to follow Peirce’s implications about the Distributed Hierarchy of a Universal Grammar in all the languages of the cosmos, I use the principles exposed in figure 7 to join the pragmatical role of infinity (∞) and nothingness (0) to the sameness/repetition (1) that rules semantics-morphology, syntax, and physical means (figure 8) in any language.¹⁷

5.1 The Role of Pragmatics in Readjusting Semantics, Syntax, and Physical Means

Figure 8 follows Charles W. Morris’s simple scheme of placing pragmatics above grammar. A Universal Grammar has to comprise the fact that, in building spontaneous dialogues and creative texts, pragmatics (the second attention/intention) readjusts grammar rules (the first attention/intention). Recall, however, that Morris’s behaviorism hid from him the social dimension of Peirce’s cognitive view. In the wake of most semioticians, Morris did not grasp the essence of Peirce’s pragmaticism: Expose any dialogue of the self with the other to win-win situations. Morris did not realize that the devil in our second attention (figures 5 and 6) invites despots and misers to overwin.

Figure 8 follows Morris’s view that physical means are readjusted by syntax; syntax, by semantics; and semantics, by pragmatics. In my interpretation of Peirce’s Pragmaticism, however, without a pragmatics immersed in a social dimension, semiotics goes out, while madness comes in. As with the Aztec Tonantzin and the Hindu Aditi, true mothers

¹⁷ Morris included in semantics anything that is not syntax or physical means.

are graciously predisposed to defeat madness in following their Third Point. Relatedly, envision a mom and her deaf-mute, 10-year-old daughter.

While crying, the girl gives her parent a paper in which she has written, “a *tear* in my eye”. A behaviorist mother would empathize with her daughter by falling into crying herself. But our mother would show a different empathy by valuing a paradoxical fact: *The words “tear” associated to crying and “tear” associated to ripping are homographs.*

If I had to read the *previous sentence*, I would read it correctly because the two homographs are clearly linked to their respective contexts. But without a social pragmatics, no one could read the grammatical message exposed in figure 8.

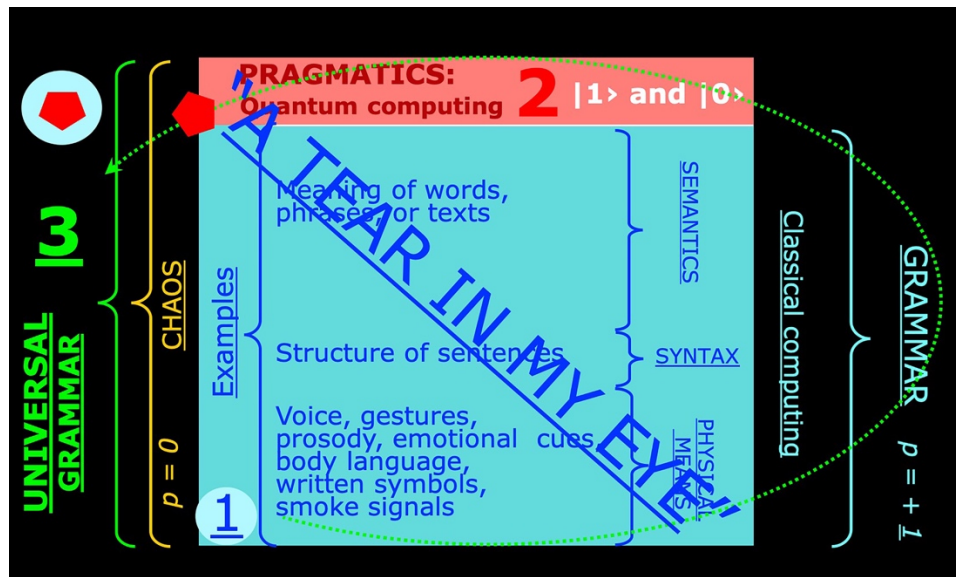


Figure 8. The Distributed Hierarchy of a Universal Grammar

Indeed, **doubt** about the true meaning of the message would invite any true mother to interpret the ambiguous word “tear” under the eventuality that its meaning might correspond not to a bout of sadness in her daughter but to a “tear-ripping” in one eye and an empathic “tear-drop” in the other eye.

A true mother would “suspect” that her daughter might have had a dangerous accident; and will take her immediately to the ER (Emergency Room) in the nearest hospital. Within suspicion, any true mother would embrace the infinite speed of ubiquity by placing her self simultaneously (2) in the context of a “tear” in my dress” (“teə,” IPA) and the context of a “tear” in my eye” (“tiə,” IPA). After dividing her attention by embracing infinite speed, the Third Point of that mother would invite her to return to a new and hypothetical interpretation of reality (3) in figure 9) through the principle of Coincidence (the dot/crossing-point at the right of the crossing line of the two planes).

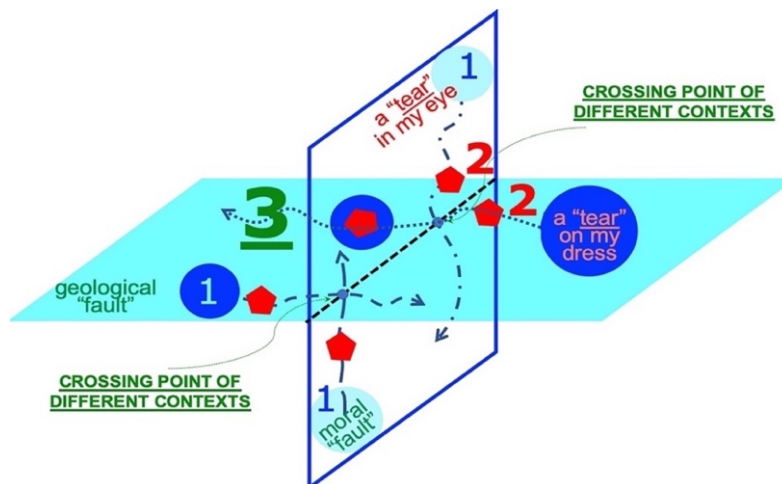


Figure 9. The crossing of contexts in homographs and puns

5.2 The Crossing of Different Contexts

In facing a **problem** with the **hope** of solving it serendipitously, we cry when the problem cannot be solved; **laugh and cry simultaneously** when we realize that solving a problem today will lead us to an unsolvable problem tomorrow; or **laugh with contentedness** when we realize that unfathomable *problems and amusing puns go by the same structure*.

Thus, in the pun in which, after an earthquake, a small mountain tells the opposite big mountain, “It was not my fault,” the witty listener will return to reality by **laughing** with the meaning of a geological fault and the meaning of a moral fault.

Our laugh after understanding a pun proves that the principles of Impenetrability and Locality in spacetime do not suffice to **choose well** or to **give up** choosing when we face polyvalent words (e.g., “tear” and “fault” in figure 9).

Most people do not get “missed” in the “mist” when they talk to each other or when they **read** a creative text because the principles of classical computing talk to the principles of quantum computing in the social mind—the reason why any decent politician can **read** a paper upside-down.

5.3 The Secret of the Alphabet

Don Juan, the “**Man-of-Knowledge**” who in the 1960s tried to teach the cognitive reality of **quantum computing** to the anthropologist Carlos Castaneda, told once his pupil about an untaught politician who was caught holding the sheet of his inaugural address upside down (Castaneda, 1974). That illiterate politician saved face by claiming that *anyone could read a writing upside down*—a **statement** that Castaneda never **deepened**.

At first sight, the claim of the unschooled leader seems wrong. For example, in a downside turn, the letter “b” becomes the letter “p”; and the letter “d” becomes the letter “q.” To complicate matters, the letter “b” becomes the letter “d” when it is placed in front of a mirror, whereas the letter “p” becomes the letter “q” (figure 10).

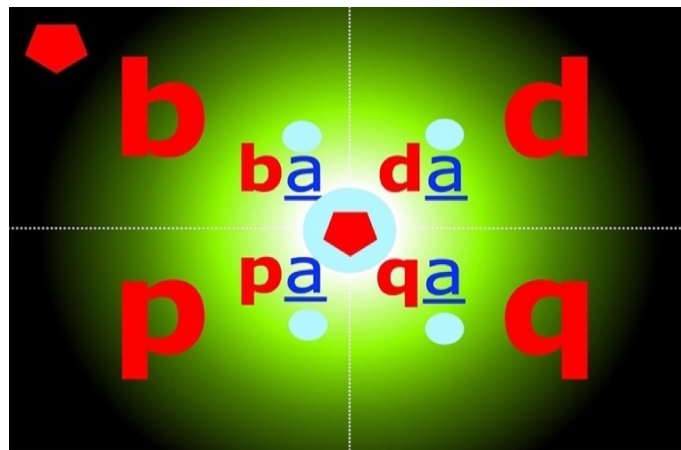


Figure 10. The secret of the English alphabet

Autistic individuals show us another facet of the mystery unleashed by polyvalent graphemes. If we show an autistic boy that the grapheme “6” should be associated with six objects, he will also associate the number “9” with six objects (Cassella, 2918c). To an autistic—more than to a nonautistic child in the process of learning how to read, the letter “b” and the letters “p,” “d,” and “q” make the same thing; as do the numbers “6” and “9.” The reason of autistics is simple: No one can change into a different person by turning 180 degrees on a couch.

Their respect of monovalent graphemes suggests why retarded autistics will pass the “mirror self-recognition” test ascribed to age two years (Cassella, 2019b; Gallup, 1970) and will predictably fail the ToPP test related to **pretend play** (Clift, Stagnitti, and de Mello, 1998) at the age of two years: *Autistics can fathom monovalence, not polyvalence.*

Figure 10 demonstrates that the union of **polyvalence** (e.g., in the letter “b”) with monovalence (e.g., in the letter “a”) equates the union of **pragmatics** with grammar in the Universal Grammar behind all languages.

5.4 The Secret of Pronouns

In the same manner that we explore and treasure polyvalent graphemes or phonemes, we can explore and treasure any **polyvalent word**, be it a noun (the case of the words “fault,” “tear,” and “mist”), an adjective (the phoneme “missed”), a pronoun, or even a humble preposition.

By way of illustration, consider the story in which a Native American chief gives a ride to a Native American woman

holding a bottle of whisky in her left hand. Upon looking sideways at the bottle, the driving chief says after a while, “Good whisky!” Following his words, the woman says, “I got it *for* my husband.” “Good trade!” remarks the driver.

Suppose also that in a bank a nonautistic customer sees a pen on the floor, near the lady ahead of him in the line. He might pick it up and offer it to the potential owner with the words, “I truly know that *this* is *not my* pen; can you tell me if it is *yours*?” If she answers, “It is *mine*! How kind of *you* to return *my* pen to me here and now, just when *I* need it,” the male customer will rest sure that he did the right thing.

Still, how could the two interlocutors understand each other if the woman called “my pen” what the man called “not my pen”? Besides using opposite determiners (*my, not my*) and possessive pronouns (*mine, yours*) in denoting the same object, they replaced their respective names with mutually exclusive personal pronouns (*I, you*). The evasive qualification of “deictic” to the capacity of normal humans to adapt to context in the use of personal pronouns does not explain why autistic individuals fall into pronoun reversal (Cassella, 2018c). However, the thought that in the previous example **infinite mental speed** allowed **both bank customers to exchange place without moving from their respective locations** will do; as does the American ventriloquist Darci Lynne by **existing** in three places **simultaneously**.

Odysseus too **embraced infinite speed** when he told the cyclops Polyphemus that his name was “**Nobody**” (Pindemonte, 1922). When nearby cyclopes inquired about the pain-loaded screams of Polyphemus, whom Odysseus had blinded not to become a “hors d’œuvre,” the one-eyed giant voiced harshly, “Nobody has blinded me!” His neighbors left him alone. The autistic cyclopes never **saw** the **polyvalent mask** by which a noun (“Nobody”) **hid** behind a pronoun (“nobody”).

5.5 The Mask of Zorro

Children are thrilled by the masked heroes (the Phantom, Batman, Spider-man, Zorro, etc.) that dwell in the “**World-of-the-in-between**”—or the **unknown ($|1\rangle$ and $|0\rangle$)**¹⁸ **between known order and unknowable chaos** (figure 11).



Figure 11. Zorro in the world of reality (yes, left), unreality (no, right), and the “**World-of-the-In-Between**”

The story goes that in the California of old lived “Diego de la Vega,” a hidalgo. Under the black mask and attire of **Zorro**, Diego’s **hope** and **compassion** (the middle column) fought a shady Governor and his Captain of the Royal Guards.¹⁹

The mysterious **Zorro**, his “**Cordobes hat**,” and his **rapier** make the **less-than-perfect world** of invisible **pragmatics** that readjusts the perfect laws (**grammar**), violated by **Zorro-the-bandit** and respected by **non-Zorro** (Diego de la Vega).

His capacity for **being everywhere** (Ubiquity) and **nowhere** (Coincidence) allows Zorro to **SEE** the malicious tricks of the Captain of the Guards and to **WILL** a better world for Californians and Mexicans alike. The main message of figure 11 is that **nonbeing in the third column to the right is as important as being in the first column**. If **nonbeing**, **mosquitoes**, and our **enemies** in the third column vanished, **being and nonbeing**, or the **world of the “in between,”** would vanish too; and **creativity** with it.

¹⁸ Pronounced “*ket one and ket zero*.”

¹⁹ Although Diego should go in the first column of figure 11, he has to hide in the third column to save his freedom.

Likewise, in figure 12 the **quantum power** (the bow) and the **infinite speed** of the gray/black circles of **pragmatics** would vanish if either end of classical power (being or nonbeing) vanished. (I hope that despots **will** notice this fact before brutalizing their foes.)

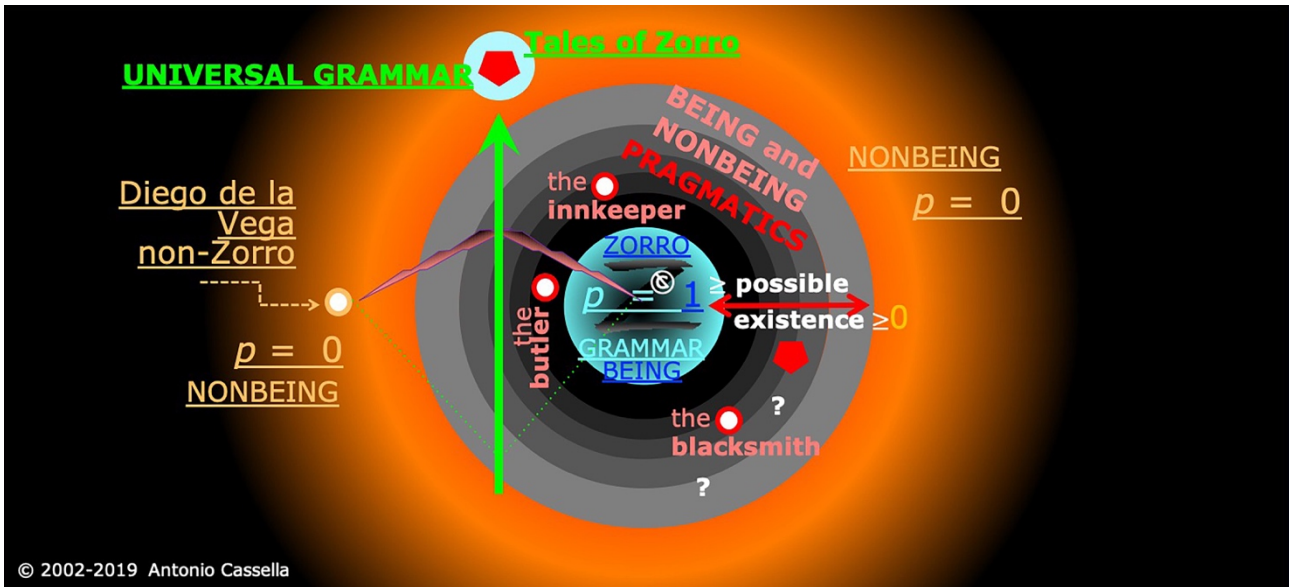


Figure 12. Zorro and his variations in the mind of the Captain of the Royal Guards

5.6 Creating New Prototypes

While he keeps his own routines invisible, **Zorro sows doubt** in the certainty of the routines followed by a few visible prototypes (e.g., his butler, the innkeeper, and the town blacksmith in figure 12). Script writers of Zorro’s movies know that both Zorro (the bandit) and non-Zorro (or Diego de la Vega) must be protected in saving the **tension** of Zorro’s fans and **unknown variations**, which *might enter* reality as new prototypes (figure 13).



Figure 13. Being, nonbeing, and being-and-nonbeing from a snake (1), through a dragon (2), into a dragonfly (3)

As figure 13 shows, the tension of “Coatl-quetzal”—as a snake-scaled **and** bird-winged dragon—**joins** the prototype of a “snake” ($p = \text{probability} = 1$) to the denial-nonbeing ($p = 0$) of the prototype of a “bird.” Any dragon ($1 \geq p \geq 0$), **Zorro**, or “**earth-sky**” can be linked to **pragmatics**; and any **dragon** may swallow the copy of a prototypical “fly” (non-Zorro, or Diego de la Vega) in **becoming** a “dragonfly.”

The **second attention** creates new prototypes (into the Third Attention at the bottom of figure 13), after affirming and denying simultaneously the prototypes guarded by the first attention.²⁰ I hypothesize that *the being-and-nonbeing of the quantum computing inherent in simultaneous affirmation and denial cannot take place in the same autistic domain in which classical computing guards the being of prototypes* (the forebrain); for prototypes are sacred.

For example, if a stroke destroyed the image of “Popeye” in our right cerebral hemisphere, we could not read the word “spinach,” and perhaps the names of vegetables. Similarly, if Tarzan lost the image of the first monkey he saw, he could not separate his friend Tantor/elephant from his enemy Sabor/leopard, or read the names of the leaders (animals) that deny global warming.

Before the going of Coatl-quetzal into **pragmatics** (and after the **return** of Quetzal-coatl to the world of semantics, syntax, and physical means), prototypes can only court the classical being ruled by grammar. Thus, when Diego de la Vega talks to the Royal Captain, *Zorro’s butler rides in town dressed as Zorro*. Equally, *copies of prototypes must ride*.²¹

Any expendable copy of a cerebral schema can be denied in the cerebellar cortex, before becoming part of the fleeting reality of **being and nonbeing**. Under moonlighted **doubt**, the masked butler accompanied by the unmasked innkeeper and blacksmith (figure 12) court **pragmatics** in cerebellar micro-complexes darkened by the mysterious blackness of **Zorro**. Mystery may hide behind a *silk mask*, an *iron mask*, and even behind an *unmasked sign*.

5.7 The Man in the Iron Mask

In Alexander Dumas’ novel *The man in the iron mask* (Dumas, 2000), the three musketeers Porthos, Aramis, and Athos imprison in the Bastille the king of France, Louis XIV, and free his identical twin brother Philippe, who is accepted as the real king by extant courtiers in the royal palace. The trick is uncovered by Fouquet, the minister of finance, who places King Louis XIV back in power. The latter orders D’Artagnan to get rid of Philippe by sending him to the Fort Royal State Prison in Île Sainte-Marguerite, with an iron mask over his head.

In the fantasy of modern moviemaking, Philippe is avenged in 1998 by the actor Leonardo DiCaprio, who sends Louis XIV to die in prison with an iron mask over his head. The three musketeers know that behind Louis XIV’s natural factions lies his identical twin brother Philippe, while “referents” (objects), “signifiers” (names), and “signifieds” (mental images) embrace the **fog of the unknown** in the mind of a few **suspicious** courtiers.

In that fog, one referent (the king of France) **lies in two places at once** (the royal palace and an infamous prison) and two referents (Philippe and Louis XIV) **share the same space at the same time** in the body of the free twin, while the use of **ubiquity** and **coincidence** feeds the **tension** that **enlivens** spectators—with an ironic twist: *As with the musketeers who know the truth behind the real factions of Leonardo-DiCaprio/Louis-XIV/Philippe, we can reach the true referent behind an irony* (“N,” at the top of the rose-window in figure 14).

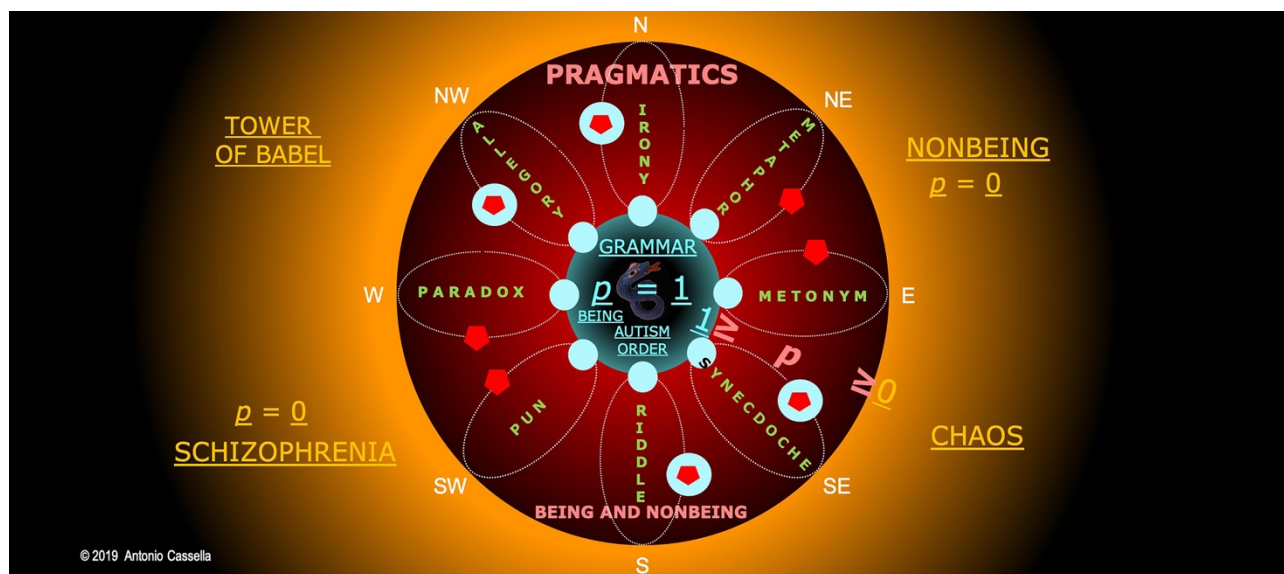


Figure 14. Polyvalence in some examples of “pragmatic” categories that autistics cannot handle

²⁰ Here, the quantum computing term $|1\rangle$ and $|0\rangle$ (ket one and ket 0) parallels the probability distribution $1 \geq p \geq 0$.

²¹ The author assumes that thalamic nuclei send copies of relevant information to the midbrain/hindbrain in waiting for the recognition of a **problem**, the **finding** of a new solution, or a **fight or flight** response.

The next story might clarify the point under scrutiny. In Caracas's crime-ridden neighborhoods, most families keep closed the main door to their high-rise apartment. The teen daughter of a working mother, however, never learned that needed cautiousness.

Day after day, upon coming back from work, the worrying mother finds the door to her apartment open, until she decides to use irony in teaching her daughter about **social prudence**. That lucky day, the mother finds the door open, as usual. But she tells her daughter with a kind smile, "I see that today you closed the main door." Her affirmation goes against reality, *for the door is open*; yet her **irony** induces a novel **shame** in her girl, who stops making that **maddening mistake**.

Metaphor is more popular but less encompassing than **irony**.

5.8 *The Fox of the Desert, the Riddler, Batman, and a Poor-Rich Man*

Metaphor ("NE," or the second petal to the right, in figure 14) is a figure of speech²² attached to a substitution that draws on a relationship of similarity. In it, **being-and-nonbeing** also meddles with Ubiquity and Coincidence.

When we say that "General X is a fox," for instance, we do not mean that he **stands simultaneously** in the world of humans and in the world of animals, or that a fox and a man **share the same space at the same time**. We just mean that General X is as sly as a fox.

Metaphors are effective, gracious, and yet nonsensical. To prove the point, if General X catches a fox, the animal was not smart; and if the fox escapes General X's traps, the general cannot be smart. During World War II, General Erwin Rommel liked the nickname "Fox of the Desert," which he gained by winning several battles against the English Army in the Libyan desert. After the capture of the spy he had in Cairo, however, he had to return to Germany and Hitler—abandoning forever Africa, his metaphorical nickname, and glory.

In **metonymy** (figure 14, "E"), a referent is substituted for something closely associated—e.g., its cause. In the sentence that God directed to Adam, "In the sweat of thy face shalt thou eat bread . . ." (Genesis, 3:19, KJV), an effect (sweating) replaces its cause (harvesting wheat)—an example of the **reversible thought** impaired in autism. Hence, metonymy too belongs to the pragmatics of **being and nonbeing**, the prohibited fruit of the "**tree of the knowledge of good and evil**," or the quantum coherence by which the devil tricked Eve. Metonymy is effective and real, although the callous leaders who can unleash apocalypse by releasing rockets loaded with hydrogen bombs do not sweat to make their living.

Synecdoche (figure 14, "SE") carries another trick. By replacing the part for the whole—a harm to reality that autistics will reject—a poet may paint the grief of the forsaken heroine and the elation of the fleeing hero. So did Ludovico Ariosto with the verse, "In the far distance, she saw the swollen *sails* of her cruel master flee" (Lipparini, 1954).²³

When ironies, metonymies, or synecdoches adorn an entire artistic work, they produce an "**allegory**" (figure 14, "NW"), through which the whole story points at a **deeper meaning**, intended to shake the reader from his **autistic stupor**.

That is why, after leaving behind his coherence-Inferno, just before the bridge of decoherence-Purgatory, Dante writes in his *Divine Comedy*, "*To navigate better waters, even now the vessel of my spirit lifts its sails, leaving in its wake a cruel sea*" (Alighieri, 1955).²⁴ Still, we cannot equate Dante's **dream** to meet "Beatrice," the lady he elevated forever, with the Riddler's **dream** to meet Batman, the opponent he wants to sink forever.

The pragmatic E. Nigma—or the **Riddler** supervillain created by Bill Finger and Dick Sprang in 1948—corners Batman with difficult-to-solve riddles. Contrary to autistics, the masked Batman uses his midbrain/hindbrain in order to solve a riddle (figure 14, "S") in no time, to fall into the Riddler's traps in time, and to **escape** from them in the nick of time. The **diabolical wit** of the Riddler and the **social wit** of Batman **confront each other** in polyvalent **hyperspace**. As with Zorro, Batman always **returns** victorious to **spacetime**. (The reader may see figure 2 again.)

Different from the **riddles** solved by **Batman, puns** (figure 14, "SW") will never return to **monovalent spacetime**. The **laugh** that follows the understanding of a pun is physical, but the **infinite speed** sought by crossing stories in puns (figure 9), is mental only. *Puns are true and false simultaneously*, as in the affirmation, "**This proposition is false.**" The previous **paradox** (figure 14, "W") sits down on the same **chair** that welcomes **metaphor, metonymy, puns**, and the **use of the subjunctive** to show off our quantum computing ability for reaching almost anywhere in hyperspace; as does the "**queen**" on a chessboard, the **Goddess Mother**, the **Holy Ghost**, or the **Queen** of the cosmos (quantum computing).

²² According to Happè (1994), autistics cannot handle **metaphors**.

²³ My translation from Italian.

²⁴ My translation from Italian.

In contrast with Spanish and Italian, English and Hebrew rarely **use the subjunctive**. However, the Jewish-American actor “Zero” Mostel **used** repeatedly the **conjunctive** “If I were” in the 1964 musical *Fiddler on the roof* written by Sheldon Harnick and Jerry Bock.

The verse, “If **I were** a rich man” of the eponymous song encompasses a **play-pretend game** in which Mostel (and Chaim Topol after him) **imagined** what it would mean to him **to be rich**. Because Mostel “**was and was not**” **rich** or **poor** while singing “*If I were a rich man,*” he **belonged to opposite worlds simultaneously** (in line with the principle of Ubiquity). One may assume, then, that Mostel **was conscious simultaneously**—as a true actor **is**—of his material **poverty** and of his cognitive **richness**. Only **coincidence** in his **midbrain/hindbrain** could take him back to his **forebrain**—into a **spacetime** in which **ignorance of the reality of Common Sense**, the lack of Democracy, or interference in the electoral process places to-be-rich leaders into besetting cognitively **rich** concitizens.²⁵

5.9 The Relationship of the Forebrain with the Midbrain/Hindbrain

Functional neuroimaging in persons that present selective impairment of one category of objects (e.g., “animals”) over other categories (e.g., “fruits and vegetables”) (Caramazza and Mahon, 2003), reasoning about the relationship of sensory modalities and object domains (Mahon and Caramazza, 2008), and a review of the theories about the organization of object knowledge in the brain (Mahon and Caramazza, 2009) suggest that *the Common Sense hidden in the association of ubiquity and coincidence with locality and impenetrability, remains unrecognized.*

The **ignorance** by which Emperor Diocletian ordered Mauritanian archers to convert Saint Sebastian into an **urchin** is set aside hypothetically in figure 15.²⁶ The **bow** shown in figure 15 implies an **archer** and Peirce’s Science behind **irony**.

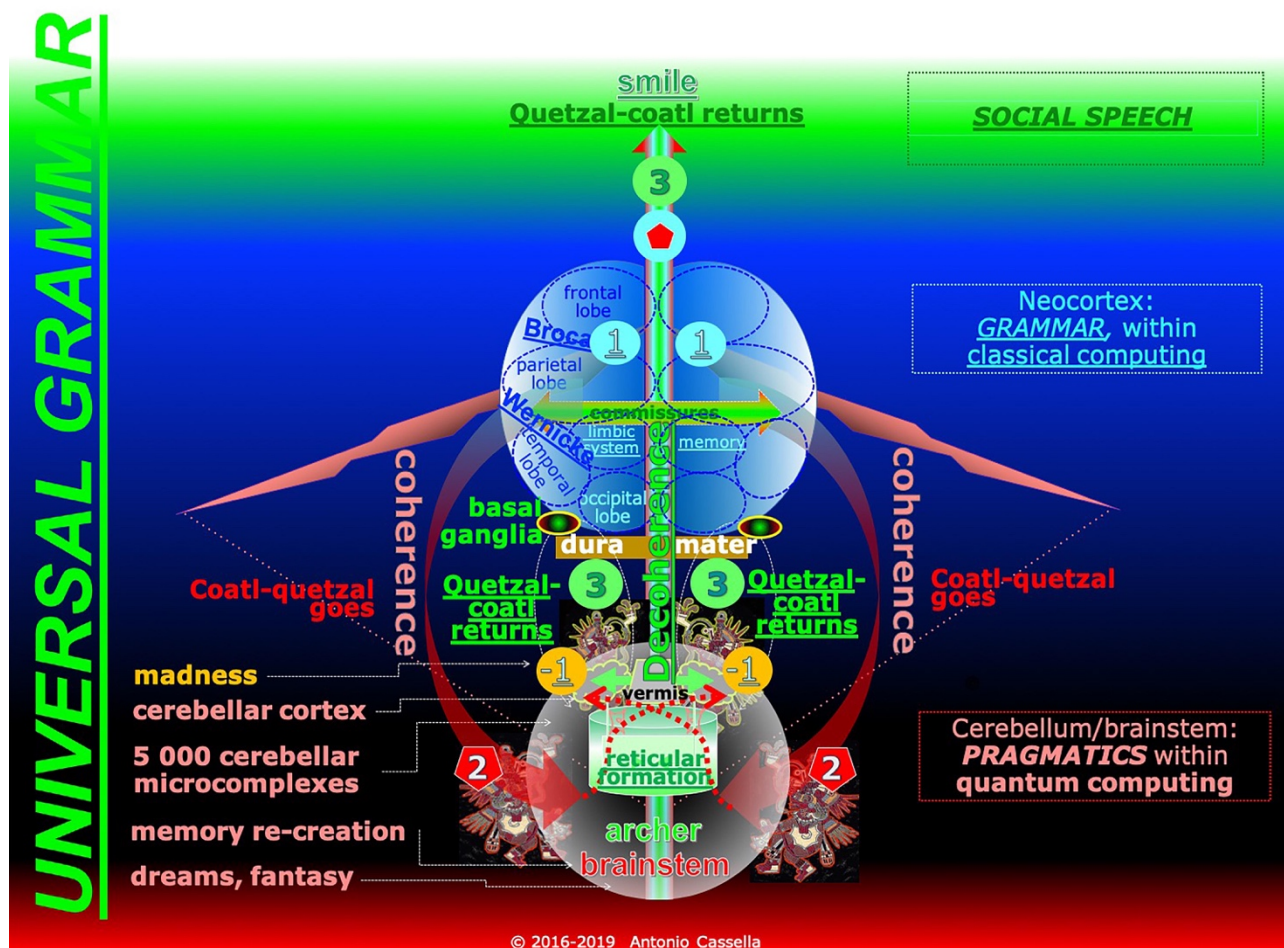


Figure 15. The “**link**” between **grammar/classical-computing** and **pragmatics/quantum-computing** in the brain

²⁵ At the moment, 1% cent of us are autistic; and 1%, schizophrenic.

²⁶ **Saint Irene** cured **Saint Sebastian**; but the scars on his body resembled the ones of the few survivors of bubonic plague. Thus, if people without access to antibiotics were bit by fleas carrying bubonic plague, they could pray Saint Sebastian.

Modern neuroimaging has found that syntactical rules are stored in the left cerebral hemisphere. For example, Broca's "expressive aphasia," in which a person comprehends what he or she is told but cannot speak or write, involves the frontier between the left-frontal lobe and the left-parietal lobe (Brookshire, 2007).

In Wernicke's "receptive aphasia," at the frontier between the left parietal and temporal lobes, people utter legitimate, yet empty, sentences (Kennison, 2013).

Both Broca's and Wernicke's aphasias in the forebrain point at an **overseeing structure** (figure 15). Also the modern philosopher, mathematician, and scientist René Descartes inferred that human intelligence transcends our forebrain. The service with Maurice Prince of Orange must have brought Descartes in the early 17th century to see a few skulls sliced along the sagittal suture of our parietal bones by the fierce cutting edge of Hussars' curved sabers. And the sight of enemies crossed with arrows must have helped him **reason out** that our two different cerebral hemispheres must be **coordinated** by an **archer** removed from twin-like structures.

In place of the pineal gland chosen by Descartes, I posit that the prototypical meanings of semantics and the rules of syntax stored in the cerebral cortex are readjusted through the **pragmatics hosted by cerebellar microcomplexes**. Cerebellar microcomplexes guard the unique **archer** that helps us deal with ambiguous stimuli and discourses.

To that matter, I propose in figure 15 that an **archer nonlocalized** in one or more among 5 000 cerebellar microcomplexes directs a cerebrum-cerebellum-brainstem-bow neurocircuitry, which coordinates both the different lobes in each cerebral hemisphere and the left hemisphere with the right hemisphere. Neuroimaging of the whole brain has shown (Buckner, 2013) that the association cortex projects to the cerebellar deep nuclei and to the contralateral cerebellar cortex.

According to Buckner, the **cerebellum** contains copies of the maps stored in the neocortex. The cerebrum and the **cerebellum work together** in mammalian species. Mammals with a large cerebrum have a large cerebellum—*within a neurocircuitry built by hunting in groups an intended victim that had to escape alone*. That said, the way in which the association cortex works with cerebellar microcomplexes is unknown; for one reason mainly: Lesions in the cerebellum cause *subtle changes* that researchers have been unable to reason out (Buckner, 2013).

The anatomy of different brains of infant and adult deceased autistics (Bauman and Kemper, 2006) and the performance of nonretarded autistics in neuropsychological tests (Cassella, 1997, 2000, 2011), however, suggest that spontaneous discourse relies on the uniplural relationship of a **pragmatic nonlocality** handled by cerebellar microcomplexes in the midbrain/hindbrain with a grammatical locality hosted in the forebrain.

I will discuss next the harmony of rigid-classical and **flexible-quantum** computing in the brain of humans and cats.

5.10 The Crossing of Internal Models

I described last year (Cassella, 2018b) how we may link through finite speed a purpose wanted by the self (e.g., the inverse model by which we offer a sweet to a visitor) with a purpose wanted by the other (i.e., the forward model by which a visitor extends his arm to grab the sweet). Still, a one-year-old nonautistic girl might lean on cerebellar internal models in **teasing** an unaware visitor by **retracting** her hand at the last second. Although the little girl can neither represent or meta-represent yet (recall that meta-representation arrives by age 6.5 or before), her mind can **embrace simultaneously** a conceding inverse model and a denying inverse model by **crossing with infinite speed** (Ubiquity) the **chasm between being** (affirmation) and **nonbeing** (denial). Regrettably, an adult autistic would **tease** no one.

As figure 16 shows from left to right, by conceding candy in the end (3), the **playing** youngster will **return** to spacetime from the Coincidence in which she had deconstructed her self. Her **social** concession (3 in the center circle and the right circle) would follow the **teasing**, or **musement**, backed by her cerebellar Ubiquity (2 in the same circles).

Through **teasing** (2) followed by **concession** (3), a seven-year-old child may **combine** known schemata of familiar words in **spontaneous and novel dialogues**, in which **unsettling ambiguity** (2) **is transformed** (3) into **new repetitive memories**, or the togetherness of the two sides of a metaphor produces a serendipitous **understanding**.

In a **dialogue** filled with metaphors, two interlocutors **go** (2) into the hyperspace of neural quantum computing embedded in pragmatics by **teasing** each other (center-left)—before **returning together** (3) to the shared spacetime evoked by classical computing. *That scheme suits the case of the buffalo that 40 000 years ago escaped the chasing unleashed by an ambush of saber-toothed tigers or by a party of human hunters. The scheme suited also the predators.*

5.11 The Symbiosis between Saber-toothed Tigers and Buffaloes

In a chat Masao Ito and I held in Cambridge (MA) about ten years ago, near the Picower Institute for **Learning and Memory** of MIT, we could not connect autism to a specific cerebellar internal model. I hypothesize now (the middle circle in figure 16) that autistics suffer an impairment in the capacity by which: a) a saber-toothed cat **crossed** two inverse models **with** two forward models to kill an escaping gazelle or b) a gazelle escaped an ambush of smart tigers.

In other words, **quantum computing** in the cerebellar microcomplexes of mammals is the product of lucky ancestors, born with the capacity for adding **polyvalent** to **monovalent** computing to hunt a prey or escape a predator. Autistics cannot easily use **quantum computing** in **re-adjusting** classical computing.

We will continue to be lucky if our leaders realized that **saber-toothed cats** are gone, that **prides** of hunting lionesses are vanishing, that our pride is soaring, and that **cockroaches** familiar with the uselessness of **WMDs**, the corruption of **ambitious militaries**, the appetite for caviar of **manufacturers of weapons**, and the ills of **excessive consumerism** might contemplate **empty squares** from the heights of any wall of Washington’s, Moscow’s, and Tiananmen’s obelisks.

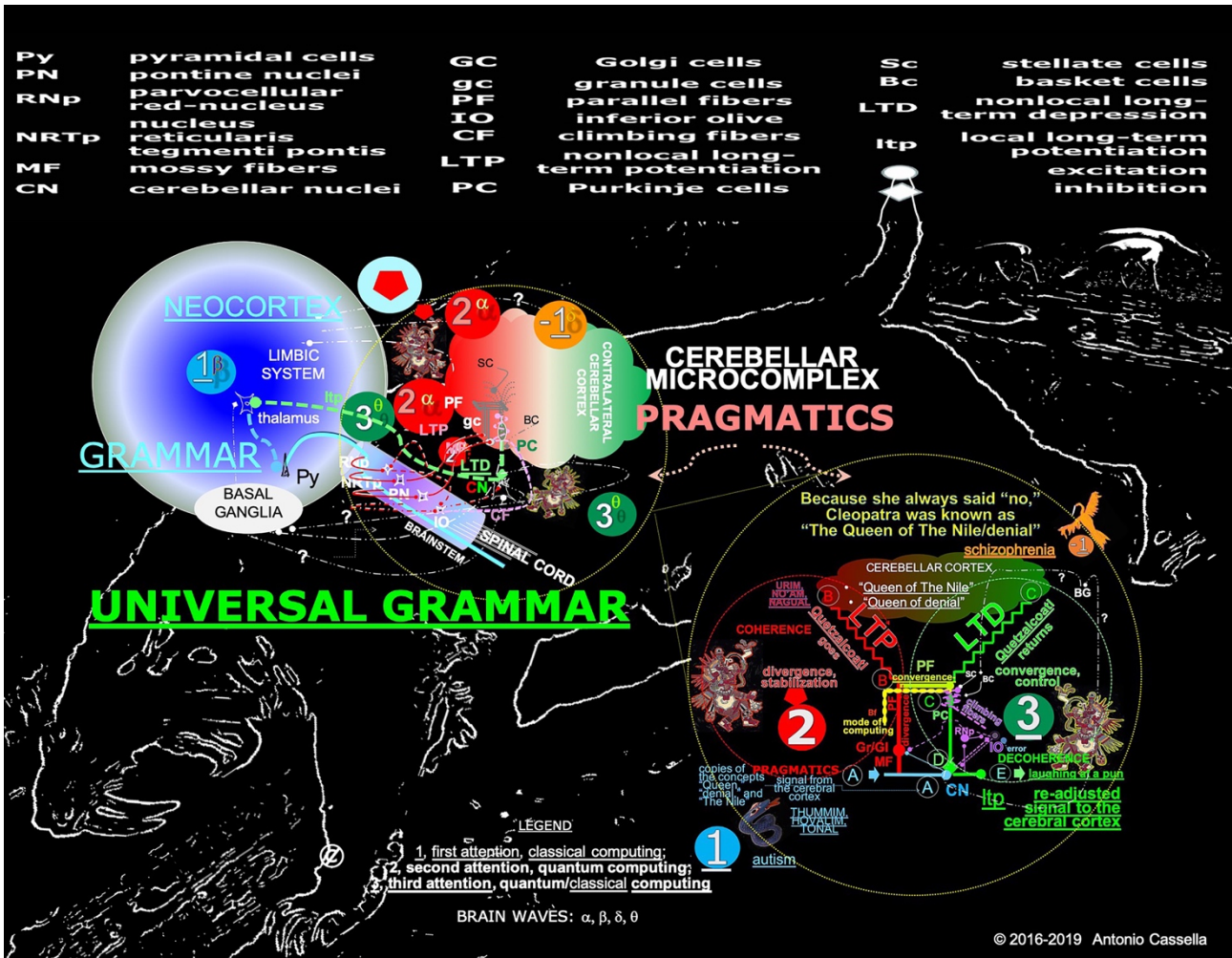


Figure 16. Searching for (2) and producing speech and puns (3) between sanity (1) and madness (-1)

In line with the neural implications of Peirce’s semiotics, I consider that,

- the **crossing** of two inverse models (in 2) precedes a speaker’s ability to **express a metaphor or a pun** (e.g., about Cleopatra as the “Queen of The Nile/denial” at the right of figure 16) (in 3); and
- the **crossing** of two forward models (in 2) precedes a listener’s ability to **understand** a pun (also in 3).

These thoughts allow hypothesizing that **crossing** two forward with two inverse models underlies further possibilities,

- o a gazelle may **escape** a pride of lionesses;
- o the maker and the reader of a pun may **laugh together** (in 3 at the right circle in figure 16); and
- o we can **regain conscience** of our hard-won disposition to use **common sense**, to reach our Third Point, and to **change** our dismal future into a new opportunity of re-creation and Progress.

The latter hypothesis concurs with the **dialogue** that took place about 150 years ago between two Argentinian “gauchos” (“cow-boys” of the Pampas), at the south shore of the estuary of La Plata River.

6. Conclusion

6.1 A Dialogue between Two Gauchos of Old

Figure 17 shows seven stanzas of the poem *Fausto* by Estanislao del Campo (1866). In *Fausto*, the gaucho “Anastasio el Pollo” plays with internal models stored in his cerebral memories in order to recount to a gaucho-friend of his, “Don Laguna,” the gist of Gounod’s *Faust*, which he had just seen in the “Teatro Colón” of Buenos Aires.

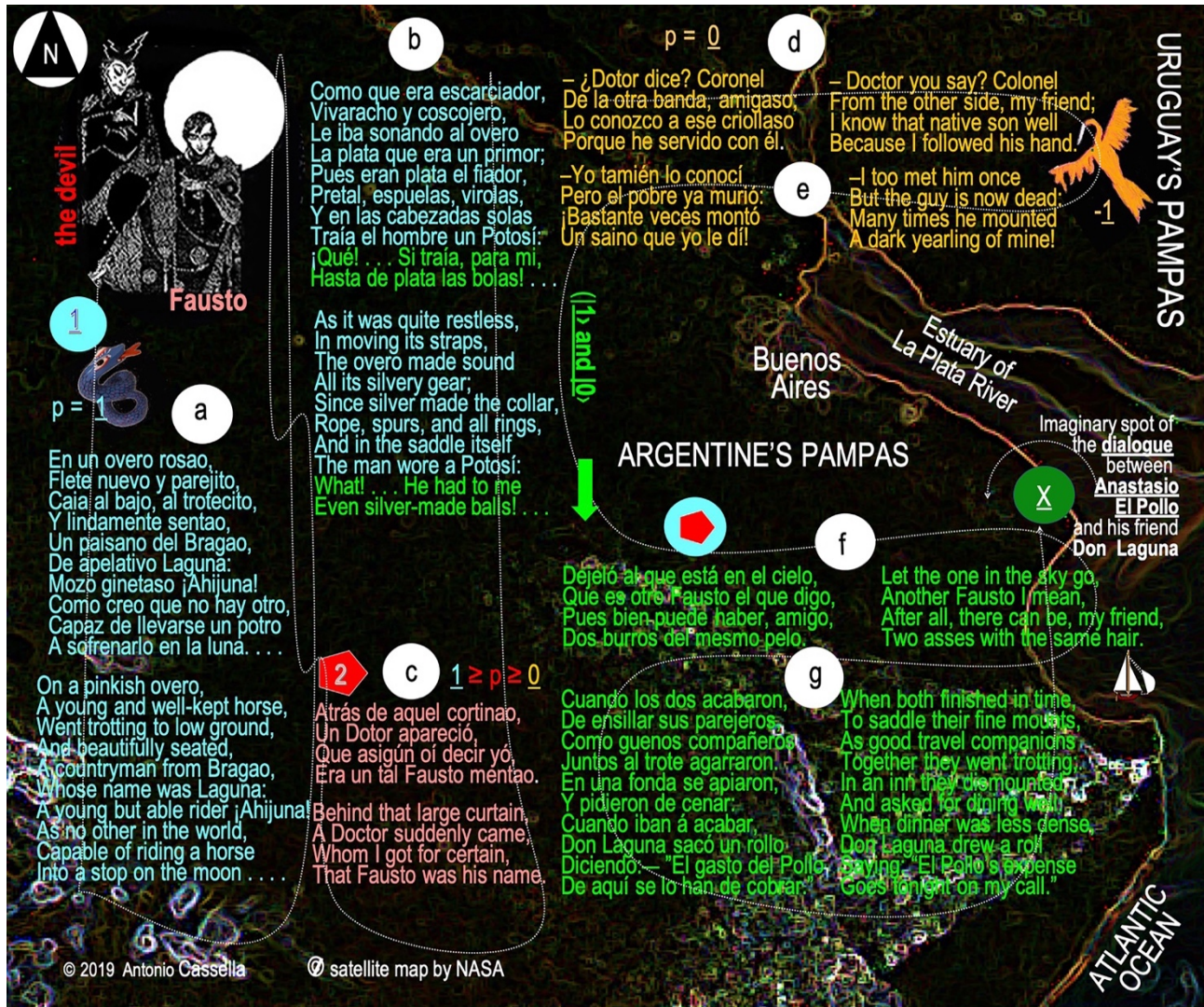


Figure 17. Seven key stanzas of *Fausto*, a satirical poem published in Buenos Aires by Estanislao del Campo in 1866²⁷

Comments about the blindness to **theatrical play-pretend** by Don Laguna and El Pollo abound. However, the writer-poet Estanislao del Campo “**knew**” unconsciously that the poorest Argentinians of his time could remember (classical computing), recognize a problem (quantum coherence), and find witty solutions (quantum decoherence). Although he makes some crazy mistakes in *Fausto* (stanza [d]), the role of Don Laguna cannot be limited to **coherence** in the second attention; whereas El Pollo clearly shows that he masters **decoherence** in the Third Attention. Behind the poetical discourse of both gauchos, of course, stands the cognitive richness of Estanislao del Campo, who masters the first attention (Thummim), the **second attention** (Urim), and the **third attention** (Thummim **and** Urim). At the end of the second stanza (b), the sudden change that places the rider as a subject, instead of the horse, **evokes** the image of a gaucho with silvery balls.²⁸

²⁷ My translation.

²⁸ Don Laguna had won the silvery trimmings and his money in games of **wit** with seasoned gamblers.

Quantum coherence appears with the discontent Doctor *Fausto*, who wants to be young again ([c] in figure 17)—a simultaneously proud and maddening proposition.

After Don Laguna's erroneous attribution of the name "Fausto" to a Uruguayan Colonel ("the other side") (d), El Pollo suggests that sometimes behind the absurdity of misinformation lies just a dismal reality (e).

In stanza (f), El Pollo implies that we may exit infinity and madness by balancing elegantly the divergence of **quantum coherence** with the convergence of **quantum decoherence** ("*two asses may have the same hair*").

I reason that Don Laguna took in El Pollo's kind criticism because he too was a master of the difference between classical and **quantum** computing. Indeed, by paying for his friend's dinner at the end of the poem (g), Don Laguna conveys his respect for the narrative ability of Anastasio El Pollo, who matched Quetzalcoatl's lynx-eyed Third Point in keeping his friend **in tension** until the last second of his dramatic re-interpretation of Gounod's *Faust*.

6.2 Seizing Progress

There were few mentally blind or indifferent gauchos in del Campo's time. Our pervasive indifference to the suffering of nonhuman species and the teachings of our Sacred Texts, works of art, and philosophical theories has led us into misusing the **quantum power** (the going "Coatl-quetzal") of the Universal Grammar and losing our discernment (the return of "Quetzal-coatl"). For instance, voters may back today corrupt despots who will lead them to pervasive poverty and massacre. Peirce wrote that "a general massacre of all who have not thought in a certain way has proved a very effective way of settling opinion in a country" (Peirce, 1877, section V, § 3). Criticizing free press precedes poverty and massacre.

Controlling alleged enemies, a country, or the entire world by intentional massacre or by the *menace of chaos* continues to be a sought-after strategy to remain in power. However, the devilish leaders, pseudo-scientists, and the rigid militaries who do not get the identity " $\infty \times 0 = 1$ " should examine what happened in the 6th century CE, after a climate upheaval, to the buildings of the powerful at Teotihuacan in Central Mexico. Teotihuacans took refuge in their plan B.

In our case, *taking refuge on Mars does not make a plan B*. Likewise, a vast massacre will not help an emperor of the world to overcome global warming and stop the degeneration of our minds. Only Education and Gandhi's **Swaraj** can exchange the desire to own material goods for a cognitive wellbeing and a communitarian "disposition of heart" (Peirce, 1878, last § of Section IV) that could help us win with the other on the road to sustainable Progress!

After seizing Peirce's pragmatism, the power attached to the "**Tree of Life**" (Cassella, 2019a), memory of common sense, the return of Quetzalcoatl, and their third point, we could help our descendants by:

- *having less children,*
- *destroying all WMDs,*
- *consuming less energy,*
- *using nonoffending containers, and*
- *restoring the Commons of the Earth (e.g., oceans, lakes, rivers, glaciers, the cycle of water, forests, the atmosphere, and the freedom of nonhuman species).*

Reaching the Third Point may *stop the foolish bent for changing our cool planet into hot Venus*, and regain instead the Earth that hosted Smilodon saber-toothed cats 10 000 years ago, when *the atmosphere was cooler by 2 °C*.

The following five ideas may enliven our initial thrust:

- a) The social relationship between **pragmatics** and grammar makes the Semiotics-Pragmatism of Charles Sanders Peirce ("p3:rs," IPA) and the Universal Grammar behind any language in the Universe and the Anti-universe;
- b) fixed rules of grammar can be linked to classical computing; and flexible pragmatics, to **quantum computing**;
- c) grammar (first attention) is located in cerebral columns and pragmatics (second attention) is nonlocated in the columns of **cerebellar microcomplexes**;
- d) **pragmatics** can be associated with cerebellar **LTP** (long-term potentiation) in the infinite speed of **quantum coherence**; and
- e) our return to a **renovated reality** matches **quantum decoherence** in cerebellar **LTD** (long-term depression).

Although others may falsify my ideas, I cannot deny the possibility that the Wisdom of Ganesha and Kali will add my explanation about the Universal Grammar to the Dharma and Common Sense that underly a new wave of Progress.

Within Common Sense, most inhabitants of Earth will mount Peirce's **griffin** to sow a new wood (Giono, 2003).

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I wish to thank my wife Ligia Uribe for sustaining my dreams.

About the author

The website *researchautism.com* allows the downloading of free films and articles about autism and the logos heuristics. Antonio Cassella was born in Ethiopia in 1940. He had his primary education in Italy; and high-school, in both Italy and Venezuela. In 1965 he obtained from LUZ-Maracaibo a *BSc in Petroleum Engineering*. For the next 17 years Antonio developed oil fields in the tidal bay of Maracaibo with Creole (a subsidiary of Esso/ExxonMobil), Lagoven, and PDVSA (Petróleos de Venezuela).

In 1976, he worked with EPRCO (Exxon Production Research) in Houston; and with Strategic Planning of PDVSA between 1983 and 1993. From 1994 to 1997 he was a scientist at MIT-CEEPR (Center for Energy and Environmental Policy Research), in Cambridge (MA). His research at MIT led to establishing two scenarios of the global growth of population, energy, and the economy; i.e., until 2060 (Cassella, 2008).

In June 1997, his exploration of autism led to a *master's degree in Psychology*, the *Dean's List*, the *Thomas Small Prize*, and the *Award for Outstanding ALM Thesis in the Area of Natural and Human Sciences* from Harvard University. In 2001 Antonio Cassella received from Universidad Nacional Experimental Simón Rodríguez (UNESR) in Caracas a *doctoral degree of Research and Teaching in Sciences of Education*.

His writings in Italian, Spanish, and English at Amazon and *researchautism.com* show that we have a limited time window to restore the Commons of the Earth—among them, the atmosphere, the forests, and the cycle of water.

Persons, enterprises, and institutions that want to explore a problem of their own choosing may e-mail Antonio Cassella at *researchautism.1@gmail.com* or press the tab CONTACT US at the website *researchautism.com*.

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