

Modeling the Flesh of God: Semantic Hyperpriming and the *Teonanácatl* Cults of Mexico

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ABSTRACT

The ritualistic use of the ancient psychoactive sacrament *teonanácatl*, or “The Flesh of God,” represents an integral aspect of pre-colonial Mesoamerican culture and continues, in various syncretic forms, to this day. Providing a brief history of various tribes of Mexico known to utilize *Psilocybe* species within a shamanic context, focusing primarily on the Mazatec people of Oaxaca, this paper attempts to utilize contemporary cognitive research of psilocybin to better understand and contextualize the ancient *teonanácatl* ceremony; specifically, research into psilocybin’s induction of the hyperpriming state of cognition. Hyperpriming, or indirect semantic priming, is characterized by its expansive branched hierarchical associative structure within the semantic network and presents us with a valid and useful explanatory framework with which to interpret many of the reported psychological, linguistic, and perceptual effects underlying the traditional *teonanácatl* ceremony.

Key Words: teonanácatl, transpersonal, indirect semantic priming, psilocybin, semantic network, hyperpriming

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Introduction

Teonanácatl is a Mesoamerican shamanic sacrament used in a ritualized healing context for centuries – quite possibly millennia (Wasson, 1980; Stamets, 1996; Metzner, 2004). The word finds its roots in the ancient Aztec language, where it translates to “The Flesh of God.” Still utilized today by remote tribes, like the Mazatec, indigenous to that region of Mexico, the *teonanácatl* sacrament is typically composed of one or more mushroom strains of the *Psilocybe* genus, which were traditionally worshipped as gods in their own right (a religious practice

termed *mycolatry* by Wasson [1980]). The perceived divinatory and healing utility of the fungus derive primarily from the psychological effects of its principle psychoactive component, *psilocybin*: a naturally occurring tryptamine alkaloid whose actions are primarily mediated along the serotonin 5-HT_{2A/C} receptor sites (Presti and Nichols, 2004). These effects mirror those of other serotonergically-mediated psychedelics, such as lysergic acid diethylamide (LSD), peyote (mescaline), and N,N-dimethyl-tryptamine (DMT) and include significant subjective alterations in consciousness, with perceptual, emotional, cognitive, and somatic characteristics (Wolbach *et al.*, 1962). Of special interest to better understanding the architecture of the cognitive change underlying the psilocybin experience is the commonly-reported “rush of thoughts” (Isbell, 1959, p.32) and inspiration, which Spitzer and associates (1996) were able to measure as a function of indirect semantic priming, and, in doing so, represent the cognitive

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shift of the ecstatic state within the spreading activation model. Both this priming paradigm and the spreading of activation within the semantic network following psilocybin ingestion will be described in greater detail later in the paper, but first, a brief exploration of the history of the *teonanácatl* ceremony in pre-colonial Mesoamerica will help to provide a valuable contextual background for integrating that more contemporary cognitive research.

History

The earliest remaining documentation of the entheogenic ceremonies of the indigenous Mexicans comes from the Spanish Catholics' records of the "New World." Franciscan missionary Fray Bernardino de Sahagún, while accompanying Spanish conquistador Hernando Cortez, created the Magliabechiano Codex around 1570 which presented full color illustrations of what he labeled *teonanácatl*, the blue-staining mushroom of the Aztec people. These illustrations were, most probably, of the *Psilocybe caerulescens* strain. The subsequent suppression of the native spiritual heritage and extensive book burning by the conquering Spanish Catholics essentially erased record of the pre-colonial ceremonial practices from the literature, leading Saffor (1915) to write that *teonanácatl* was not a mushroom, but *Lophophora williamsii*, the entheogenic *peyote* cactus, native to regions of Mexico and the southwestern United States.

The Aztec emperor, Moctezuma II, held an annual spiritual celebration called "the feast of revelations," in which the philosophers and academics of his empire's *pipiltin* or nobility class would consume mushrooms in order to achieve visionary states which were perceived to have far reaching spiritual significance, or to contain information concerning future events (Stamets, 1996).

Unfortunately, the voluminous holy Nahuatl codex concerning these ceremonial practices was, most likely, among the first to be burned atop the temples by the Catholics. Any sacred texts predating their arrival would have been viewed as satanic, especially those concerned with visionary shamanic states of consciousness – states which would have been interpreted by the missionaries as the direct influence of the devil, himself, over the sensibilities of these potential Christians. Despite

the violent and devastating persecution by the conquering Spanish on the sacred heritage of the Aztecs and other Mesoamerican cultures, the ancient *teonanácatl* ceremony continued in secret, surviving only by remaining hidden to outsiders. Successfully kept secret for hundreds of years, the ceremonial sacrament was featured on the front cover of *Life* magazine on May 13, 1957. And, all at once, the secret was out – very out.



Figure 1. The ancient Aztec god, Xochipilli, or "Prince of Flowers," shown in the throes of entheogenic ecstasy (image courtesy of Wasson, 1980). Notice the blossoming mushroom mandala carved into the base of the stone statue. The "flower" symbol in Nahuatl texts is utilized in an entirely spiritual sense, in that the sacred teonanácatle ceremony, so depicted, caused 'the soul to bloom.' The distinct incurved margins of these mushroom carvings are a taxonomically correct representation of the *Psilocybe caerulescens*, or 'landslide mushroom' (Stamets, 1996).

Schultes and Reko subsequently collected samples of psilocybin mushrooms, purchased from native Mazatec of Huautla, and identified these as the *teonanácatl* of the Nahuatl (Guzmán, 1959; Davis, 1996). One of these purchased *teonanácatl* strain samples was of the classic *Psilocybe cubensis*, since popularized by both spiritual and recreational subcultures in the United States. A second Schultes' Harvard

herbarium sample of *teonanácatl*, initially misidentified by Singer as *Deconica* sp., was later identified as *Psilocybe caerulescens* by Guzmán (1959; 1960). A more recent review of the known *Psilocybe* taxonomy by Guzmán (2005) revealed some 250 species, of which 150 are known to be psychoactive. Fifty-three of these species are native to Mexico, of which only a portion (less than a third) is utilized ritualistically. As a general rule, the psychoactive strains of the *Psilocybe* species can be distinguished by their tendency to oxidize when “injured,” turning a dark blue color.

We cannot know the exact procedure of the sacred mushroom use of the ancient Aztecs or the Mayan equivalent. Even modern shamanic healers of Mexico may differ in their specific ritualistic protocol. However, the handful of reports and case studies we do have of Mazatec shamans offer a fascinating glimpse into a cosmology distinct to that part of the world, northeastern Oaxaca, in the Sierra Mazateca mountain range; specifically, the now mycologically-famous mountain town of Huautla de Jiménez (Schultes, 1939; Wasson and Wasson, 1957; Heim and Wasson, 1958; Krippner and Welch, 1992). Strictly speaking, the natives of Huautla de Jiménez are known as Huauteccans but, since they speak Mazatec, older anthropological literature labeled these inhabitants as Mazatecs, a label popularly maintained and retained within this article.

In addition to the Mazatecs of Huautla, other sacred mushroom cults utilizing shamanic rituals exist, even today: the Nahuatls of Morelos, Puebla, and Mexico states, the Matlazines of Mexico-state, the Totonacs of Veracruz, the Zapotecs, Chatins, and various mixes thereof within greater Oaxaca (Guzman, 2008). The worshiped strains of *Psilocybe* between these individual tribes are not uniform, owing much to the variety of ecosystems encompassed by the different Mexican states. The modern observable form of these ancient rituals reveals the strong influence of five centuries of Spanish Catholicism, which became syncretically rooted into the pre-colonial practices, unavoidably, over generations. The compositional similarities and differences of those pre-conquest rituals cannot be definitively known, as the majority of pre-colonial writing -- the great libraries of the Mayans, for instance -- were burned of Spanish missionaries, as the “ignorant heathen idolatry” of “primitives.” It is said these fires burned for days atop the temples,

when the Catholics destroyed the ancient libraries of a great civilization. Yet, it was the surviving “mushroom stones” of these ancient Maya that first led Gordon Wasson into Mexico in 1952, in search of clues to understand the meaning of the, as of then, unexplained stone images.[†] Within a year, Wasson would be the first scientist to consume *teonanácatl*, “The Flesh of God,” with the Mazatec *curandera*, María Sabina, in the town of Huautla de Jiménez (Wasson and Wasson, 1957; Wasson *et al.*, 1974), thereby setting in motion a cascade of academic and popular interest, culminating into Timothy Leary and Richard Alpert’s Harvard University Psilocybin Research Project and, soon thereafter, the *psychedelic revolution* and *consciousness expansion* movements of the North American 1960s. So, Wasson visiting the house of this little elderly mountain woman was a truly momentous occasion, from the perspective of the “wildfire” of widespread socio-political change that it was to inspire!

María Sabina and the Foreigners

Following the publication of Wasson’s *Life* magazine article about María Sabina and her people’s history of mushroom worship and related healing ceremonies, throngs of long-haired *searchers* began filing into her tiny Huautla town. The *hippies* had arrived! Here, from a transcribed interview, Sabina describes this intense period of sudden celebrity:

“For a time there came young people of one and the other sex, long-haired, with strange clothes. They wore shirts of many colors and used necklaces. A lot came... These young people, blonde and dark-skinned, didn’t respect our customs. Never, as far as I remember, were the *saint children* eaten with such a lack of respect” (María Sabina, cited by Estrada, 1981, p. 86).

“Before Wasson, I felt that the *saint children* elevated me. I don’t feel like that anymore. The force has diminished. If Cayetano hadn’t brought the foreigners...the saint children would have kept their power...From the moment the foreigners arrived, the *saint children* lost

[†] While the ancient Tzotzil Maya of Chiapas most likely utilized psilocybin shamanism, current indigenous inhabitants show no indications of modern use (Laughlin, 1975).



their purity. They lost their force; the foreigners spoiled them. From now on they won't be any good. There's no remedy for it" (Maria Sabina, cited by Estrada, 1981, p. 20).

When Wasson read those words, spoken by the lovely and caring old woman who had taken him into her home and kindly shared a sacred experience from her heritage with him, he was saddened and distraught. A lot had happened to her little mountain town and, apparently, the medicine, itself, following the flood of thrill-seeking American *hippies* into isolate community:

"These words make me wince: I, Gordon Wasson, am held responsible for the end of a religious practice in Mesoamerica that goes back far, for millennia. I fear she spoke the truth, exemplifying her wisdom. A practice carried on in secret for centuries has now been aerated and aeration spells the end" (Gordon Wasson, cited in Estrada, 1981, p. 20).

Components of the Traditional *Teonanácatl* Ceremony

While there is a range of variation between individual Mexican tribes and their shamanic use and worship of mushrooms, including the variance of *Psilocibe* strains utilized by a given tribe, these sacred sacramental ceremonies reveal a handful of common threads, suggesting a shared ancient ethnographic root extending back into Mesoamerican prehistory. For instance, the ceremony is exclusively held at night, with the belief, at least among the Mazatecs, that eating *teonanácatl* in the daylight will cause madness (Munn, 1973). The darkest depths of night are seen as facilitative to the visionary experience, as though the sunlit realm of physical surfaces presents only a distraction when attempting to perceive inwardly and navigate the more subtle ranges of natural life, as is believed to be revealed in the heightened sensitivity of the *teonanácatl velada* ceremony.

The modern syncretic *teonanácatl* ceremony is called a *velada*, Spanish for "night vigil." Much like the indigenous use of *ayahuasca* among the tribes of the Upper Amazon Basin, the darkest part of the night (approximately 3-5 AM) is considered a sacred spiritual period, utilized in ceremony to aid in the manifestation of visions. The sunlit world of the day, and its physicality, is

seen almost as a distraction from this more spiritual side of nature; a subtle range of experiential phenomena, which gradually reveals itself when the absence of light is combined with the hypersensitive perceptual state induced by the small sacramental mushrooms, which the Mazatec refer to as "little saints," among many other reverential terms. In several Native American tribes, this period of 3-5 AM is known as the "dark face time," when it is said the world of spirits and ancestors wraps the earth like a great black blanket, their realm coming so close to our own that communication may be facilitated *across the veil*. In all three cultural groups, those of Mazatec, and varied North and South American tribes, it is experienced that this subtle range of natural life may reveal itself, most often as direct entity interaction, whereby information, healing, or guidance is revealed through hypnagogic visionary or mediumship states. The "night vigil" and the "vision quest" are similar in this way, and the *velada* and *ayahuasca* ceremony, are, in some ways, even more steeped within a rich cosmology of direct spiritual interaction. These rich cosmologies often define a hierarchy of spiritual entities, both benevolent and malevolent, with whom the shaman may form healing alliances, battle, or even establish agreements with; dealings which sometimes involve elaborate bargaining or trickery on the part of the shaman to get what is needed – be it information or assistance – from these supposed ancestors and entities. For all of these different forms of spiritual experience during the given ceremony, darkness is the basis that facilitates the subtle perceptions during the induced state of ecstatic hypersensitivity. The *Middle World*, this material objective environment of waking consciousness, is seen almost as a distraction in this instance from this more subtle range of natural energetic phenomena which, with the right tools and perceptual skillset, may reveal itself to the shaman when the absence of light is combined with the heightened sensitivity of the non-ordinary state of consciousness. The following quote from Maria Sabina describes the revelatory importance of darkness to the traditional *teonanácatl velada*:

"During the vigil, the candles of beeswax that are used in the vigils should be put out; the darkness then serves as a background for the images one is seeing. It isn't necessary to close one's eyes, but only to *look toward the infinite*



background of the darkness" (Estrada, 1981, p.90).

The *velada* "night vigil" is always held under the guidance of a shaman, either a man or woman, and typically at that individual's home, utilizing a Catholic altar space (Guzmán, 2008). The use of Catholic imagery represents the unavoidable syncretic synthesis of Spanish colonial Catholicism and traditional pre-colonial shamanic traditions; a cultural pattern which manifests in many additional interesting ways throughout Central and South America. Placing the psilocybin mushrooms into a *jicara*, or gourd, fragrant resin is burned as the participants are provided with 6 pairs of wet mushrooms, typically of the same species. The *teonanácatl* is consumed on an empty stomach, and abstinence from sex, alcohol, heavy foods, and all other forms of medicine is practiced leading up to the ceremony, as well as a commonly-prescribed period sexual abstinence afterwards. It is widely believed that consuming more than 6 pairs of the mushrooms is psychologically dangerous, as is the act of mixing multiple strains of *Psilocybe* sacrament in the *jicara* at the same time. The mushrooms are never traditionally eaten alone and are not used solely to have spiritual experiences – it is a medicine for use with illness. This work is a major investment of time and energy, especially for the elderly shamans who, sadly in many cases, represent the last surviving practitioners of these ancient *teonanácatl* techniques among the Mazatec, as younger generations are drawn away to Mexico City or elsewhere, by the lure of employment and modern conveniences.

Cognitive Models of Transcendence

The influence of psilocybin on the human brain has been studied, as has its influence on associative cognition. Study designs utilizing functional magnetic resonance imaging (fMRI) show psilocybin reduces cerebral blood flow maximally in the anterior and posterior cingulate cortex (ACC and PCC). The amount of activity decrease in the ACC and medial prefrontal cortex (mPFC) was proportional to the intensity of the subjective "unitive" effect (Carhart-Harris *et al.*, 2012), suggesting the reduction of activity to these inhibitory hub regions enables a state of unrestrained associative and perceptual faculties. These fMRI studies of psilocybin's specific neurological correlates is certainly important and

still ripe for interpretation, and certainly give us valuable hints as to the neurophysiology at play during the Mazatec shaman's intentioned transition into specific non-ordinary states of consciousness. Yet, it is the influence of *teonanácatl* on the semantic network (Spitzer *et al.*, 1996) that was of primary interest in attempting to surmise the cognitive mechanics of that subjective "unitive" effect of the sacrament, and how those mechanics relate to the phenomenal shamanic journey undertaken by Mazatec healers, like Maria Sabina, in their "night flight" through subtle ranges of conscious experience.

It is primarily the exceptional subjective state induced by the "Flesh of God" that facilitates the shaman's visions. This state of consciousness, in many ways, can be thought to act like a *carrier medium*, allowing the ecstatic shaman to become receptive to non-ordinary ranges of perception -- those perceptions dependent on the perceiver transitioning into a distinct state-of-consciousness. Utilizing the standards set by Tart's comprehensive Systems Model (1975), these could be referred to as *State-Dependent Perceptions*, as they depend on one crossing over into a non-ordinary range of consciousness. The non-ordinary information content the Mazatec shaman receives during their *teonanácatl* intoxication often represents subtle aspects of their immediate surroundings, not typically perceived in normal waking consciousness. The subtle energetic signature of a person suffering systemic inflammation, for instance, or the keen empathic sense of shifts in the emotional tone of the room, can all be utilized by the Mazatec shaman in her healing work. Learning to perceive this subtle energetic signature of illness, from a shamanic perspective, is the first step towards learning to *interact* with, influence, and extract that non-physical manifestation of disease. Westerners may consider this subtle form the *electrochemical* aspect of disease: the distinct oscillatory pattern of the nervous system under immunological stress, which is, of course, localized to the area of injury, constriction, or inflammatory insult. Although this electrochemical explanation is, by no means, exhaustive to all of the shaman's many functions, techniques, and healing practices, it is an example of a subtle energetic aspect of physical illness which the Western medical model has established using quantitative research and advanced imaging technology. In her learning to



Indirect vs Direct Semantic Priming

Key to understanding the inspired cognitive shift of the *curandero* entering the inspired state of *teonanácatl* ecstasy is in the distinction between direct and indirect semantic priming effects. To illustrate their difference by example, the word *lemon* acts as a prime for the target word *sour*, thereby decreasing the reaction time of its subsequent recognition in a lexical decision making task. These two words represent *direct* priming, as they are directly related to one-another – when we see *lemon*, we automatically think of *sour*. Yet, the word *sweet* is not directly related to *lemon*, but is associated to *sour*. That is to say, *sweet* is a step further away from *lemon* within the hierarchical representation of the semantic network, with activation spreading from first from *lemon*=>*sour*, then from *sour*=>*sweet*. This is an example of *indirect* semantic priming as *sweet* is distantly, or indirectly, related to *lemon*. Also referred to as *hyperpriming*, indirect semantic priming has been associated with enhanced creativity, thought disordered (TD) schizophrenia, as well as psilocybin cognition (Spitzer *et al.*, 1996).

What Spitzer's (1996) research was able to show was that an individual under the influence of psilocybin is able to associate those distantly related concepts, like *sweet* and *lemon* much more quickly than a "sober" person in an ordinary baseline state of consciousness. In addition to being able to relate ideas that they do not typically relate more quickly and easily, the psilocybin enabled participants to associate *extraordinarily* distant concepts with one-another (see Figure 3). To use our previous example, the hyperpriming state of the ecstatic *teonanácatl* shaman would allow them to quickly relate *lemon* to *citrus*, to *photosynthesis*, to *light*, to *sun*, to *the cycling vibrant source of all living things!* You can see how the nestled implications of something as simple and mundane as a piece of fruit could, all at once, reveal the transplendent unity of all life when the semantic network becomes so *saturated* with priming in this way, following the flood of thought associations characteristic of psilocybin cognition.

One conceptualization that may serve as an explanatory aid for the indirect priming effect of psilocybin on the semantic network is a *fluent model of nodal branching*. In other words, much like rivers that branch and divide, the spreading of activation can also be represented in terms of a

volume of fluid flowing through channels. In this view, the hypersensitive psilocybin state "floods" our semantic network with attention, a broad volume which spreads far outwards across new conceptual branches, priming them into long associative strands. By thinking of spreading activation in terms of attention in this way, an individual's limited capacity to focus and clearly express those expanded semantic associations may be partially defined by the limits of that individual's attention span. "Under the influence of the mushroom, one's power of concentration is far more pronounced than normally. You become deeply absorbed in whatever you may be thinking. There is no external distraction" (Swain, 2004, p. 206).

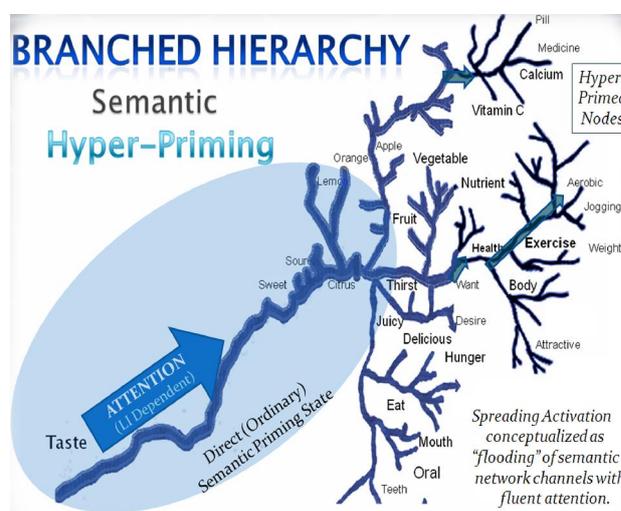


Figure 3. The hyperpriming state of cognition is induced by psilocybin ingestion and can be thought of as the result of a change in attentional processes, like latent inhibition (LI). These changes expand normal semantic activation range outwards from its baseline state, to prime semantic nodes from distant "branches" not typically associated in one's ordinary state of consciousness.

The administration of psilocybin, an agent known to affect the 5-HT system of the brain, leads to an increased semantic hyperpriming effect in human subjects (Spitzer *et al.*, 1996). This increased accessibility to typically-unavailable conceptual associations may help explain the commonly reported subjective effects of "consciousness expansion" and "enhanced creativity" classically described as characteristic of psilocybin use (Pletscher and Ladewig, 1994). Additionally, users of psilocybin typically describe a profound sense or realization that "everything is connected, or "all is one," to the point that these types of profundities have



become well-known clichés for the so-called “magic mushroom experience.” Yet, despite their popular or recreational conception, these descriptions mirror those of *unitive* consciousness: a distinct and ancient monistic mystical experience whereby the interconnection, or *unity*, of all things is realized. This unitive consciousness was considered a cultural universal by Jung, who represented it as a great archetypal circle or mandala and featured it prominently in the intricately-chronicled psychotic episode of his *Red Book* (Jung, 2009). In the Eastern cultures that so influenced Jung’s understanding of the mandala archetype, this unitive or “all is one” realization is considered part-and-parcel of transcendence – that is to say that by *transcending* the grounded view of one’s life, one may attain a rare and exceptional perspective of *height* over the inward representation of that life – colloquially, “to get high,” or attain a higher state of consciousness. To use our theoretical terminology, this perspective of height affords a *map view* of the greater expanse of the semantic network as a unitive whole; one that allows the journeyer to associate far-flung, distantly-related concepts to one-another (it is no coincidence that the term “Far out!” was popularized alongside the use of serotonergic psychedelics in American culture!) It is in this induced capacity to see the relationships between ideas that one had never before been able to see that forges novel or recombinant thought associations in semantic memory. The subjective sensation of realizing these previously unseen relationships is described as a “rush,” (Isbell, 1959, p.32) or flood of inspiration, within which the perceived exceptional creativity of the state is experienced.

“Words and concepts exploded in my brain with multilevel ripples of meanings that set off cascades of feeling and physical sensations” (Metzner, 2004, p.180).

The Mushrooms of Language

Within the Mazatec culture, the *teonanácatl velada* was defined primarily by its characteristic effect on language; inducing vivid ecstatic and animated hypervocal states in the shaman, who would weave long threads of winding thought associations late into the night. These inspired improvised poems, songs, and chants were described by Henry Munn in his famous early essay, “The Mushrooms of Language” (1973),

where he documents several Mazatec *veladas* in which he took part, writing about this distinct lexical effect of the mushroom in great detail.

“The Mazatec shamans eat the mushrooms that liberate the fountains of language...”

(Munn, 1973, p. 92).

The image of a *flow* of language, of a fountain suddenly freed where it had previously been inhibited, is powerfully meaningful and, in many ways, essentially identical to that of semantic priming, which is, itself, a way of understanding the fluidity of semantic thought using the metaphor of flowing water – to *prime the pump*, so that it flows more readily. To think of this pump being *fully* liberated – that is, to not merely be flowing, but *fountaining* – implies a more extreme semantic priming state, that of *hyper-priming*. The hyperpriming state activates many semantic concepts at once, allowing the individual to relate ideas which were previously unrelated, leading to a “flood” of novel thought associations which, when vocalized, as is done in the traditional *teonanácatl velada*, are observed as an ecstatic hypervocal state, with highly expressive, indefatigable poetic chants, typically extending long into the night, often until sunrise.

In Estrada’s published translation of several of Maria Sabina’s *veladas* from Mazatec to English (1981, p. 173), we see pages of these long-weaving tangential chants, revealing the traditional Mazatec style where each line typically ends with “says:”

I am the little woman of the great expanse of the waters, says

I am the woman of the expanse of the divine sea, says

I am a woman who looks into the insides of things, says...

Clown woman beneath the water, says

Clown woman beneath the sea, says

Sabina was describing a “great expanse of the waters,” and the act of diving beneath the surface of those waters, into the depths, into the whole realm of divine undersea life that could not be seen from outside, from the *sunlit surface* of things. This is Sabina tapping into that powerful metaphor of “oceanic consciousness,” which is touched on or utilized in an explanatory way by so many cultures and authors of various eras. The term “subconscious,” (as opposed to Freud’s



preferred “unconscious”) implies this image of *depths*: of descent through layers or ranges of consciousness. It was while in relaxation that one could gain access to the content of that subconscious state, in Jung’s time. Although Freud, too, utilized the term “oceanic consciousness,” albeit from the context of a stage of infancy, the metaphor was one which he, too, saw as something meaningful: an ocean, huge and deep; a medium density conception of consciousness utilizing three dimensions. The shaman, like a diver who can *control his breath*, holds it as they explore beneath the water. This controlling of breath represents meditation and how, when Sabina closes her eyes and slowly exhales to begin her inward meditative journey during the *velada*, she is descending beneath “the great expanse of the waters,” to where the subtle non-physical aspect of disease can be seen. By looking “into the insides of things,” illness is perceivable there, along with a great number of other things *beneath the surface*.

“Seated on the ground in the darkness, seeing with her eyes closed, her thought travels within along the branching arteries of the bloodstream and without across the fields of existence...” (Munn, 1973, p. 97).

In Munn’s quote, we see a description of the inward journey of an ecstatic Mazatec shaman, from the depths of his *teonanácatl velada*. The long expansive chants, which extend far through nestled hierarchies of semantic meaning, are described here as branching arteries, extending out with a rush of flowing fluid -- or, as the priming metaphor implies, an extensive plumbwork of pipes, primed and pumping with pneumatic pressure. These branches are expressed and displayed in the chants, as they expand outwards, through imagery and meaning, directed with the intention of a masterful guide. Munn here also shows awareness, expressed with poetic grace, of the “inwards” and “outwards” aspect of this “field of existence.” In his imagery, of a long rolling expansive field, the hidden landscape of all existence, you cannot help but notice parallels to the imagery of a wide rolling ocean used by Sabina – mirrored in that they are the two images of a wide expanse which the shaman may enter and descend beneath; the “within” and “without” of the shaman’s close-eyed travels. The branches of meaning he describes are semantic in nature, representing all the concepts of the world; of “all existence,” as he says. These branches of

linguistic meaning are conceptually identical to the branches of spreading activation seen in semantic network models, although the theoretical model can be thought of as a *higher-resolution* picture detailing these branches of meaning, one which cognitive psychologists may measure and graph changes within. Here (Figure 4), this change in indirect semantic priming is measured during the psilocybin experience.

Munn’s “Wellsprings of Meaning”

Hyperpriming is thought of as an abnormal “flooding” of semantic activation, as if that activating *fluid* being primed through those various branching channels has the potential to dramatically increase in *volume* and *pressure*, pushing outwards from the small typical branches of baseline to extend further, creating wide-reaching branches, activating deep and distant semantic nodes in the network (see Figure 2). This sudden surge of priming volume measured in the psilocybin experience (Spitzer *et al.*, 1996) can be conceptualized as a flooding inlet of attention; the pupils dilating in a state of hyperawareness and hypervigilance, the whole nervous system buzzing with vibrant sensation, the eyes allowing more light information to shine inwards from the surroundings, spurring neuronal activation and reducing cerebral bloodflow (Carhart-Harris *et al.*, 2012) to areas of the brain responsible for latent inhibition (LI), or the filtering down of sensory information from conscious awareness.

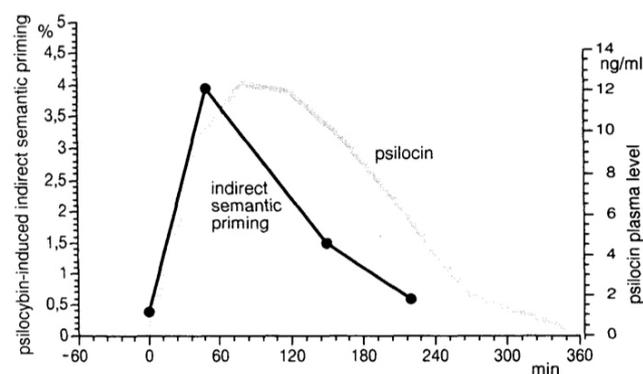


Figure 4. Mean plasma levels of psilocin, the primary metabolite of psilocybin (graph courtesy of Spitzer, 1996). Blood tests reveal psilocin is formed rapidly after drug intake, reaching peak plasma levels approximately 80 minutes after ingestion (data from Holzmann, 1995). Psilocybin-induced increase in indirect semantic priming, and subsequent decay, overlaid in 4 points.



The changes in semantic priming that occur during the *teonanacatl velada* are today as reliably-induced and, assumedly, just as profound as they were 700 to 800 years ago, among the advanced healers working within the thriving civilization of the Aztecs, to whom the modern day Mazatecs are direct cultural and linguistic descendants. The powerful psychedelic state of their sacrament induced a form a perceptual hypersensitivity, an awareness of subtle ranges of nature. Yet, in this ancient Aztec culture, such expansive realms of nature and consciousness were, themselves, referred to as gods -- a conception of god which differed dramatically from the monotheistic Catholic God of the invading Spanish Conquistadors and their missionaries. It was *Quetzalcoatl*, the winged serpent, assumedly conceived during a *teonanacatl* visionary ceremony, whose form joins the Lower world (of the serpent) with the Upper world (of the bird). His flying upwards from beneath the earth is an example of a concept Eliade (1964) considered near-universal to shamanic cultures, the *axis mundi*, or bridge between the three worlds, Upper, Middle, and Lower.

The Path of Truth, The Path of Clarity

The idea of paths appears so frequently in the shamanic discourses of the Mazatecs – often described as paths of light or paths through fields, such as cornfields. These fields, and paths through them, are used to signify movement and travel; the inward journey of the *curanderos* in their state of expressive ecstasy. A male Mazatec shaman, observed and recorded by Munn (1973), described his chant as revealing the “path of truth,” the “path of clarity,” as if his hypervocal state of ecstasy could be controlled in order to direct the rising inward light of the *teonanacatl* experience. This inward light, when so directed, can reveal what was once hidden, or in the dark. Like the directing of a flashlight’s beam onto a well-worn, previously unseen path at night, so the shaman may guide his patient along a non-physical type of path. These terms, “truth” and “clarity,” which are used to describe this revealing of the path, imply it is a path, not of location, but of meaning – or, more specifically, that the truth and clarity revealed to the Mazatec shaman during his or her illumination is seen as existing within a *field* of semantic meaning; from (node) point A to (node) point B... and C, and

further out still, along the path which extends through many areas. It is these points of meaning which the shaman connects and guides the patient, bringing *clarity*, to reveal luminous *truths* along those great journeys of association. “I am he who puts together,” (Munn, 1973, p. 113) he says, describing his shamanic function during the *velada*, that of *bringing together what is far separated*. This comment by the Mazatec shaman is a description, not of physical things, but rather of bringing together ideas and concepts of the world, which are far separated. This separation between ideas is best understood by contemporary cognitive psychology as the branch distance of spreading activation within the semantic network, which is extensively studied albeit, primarily, in terms of pathology; thought disordered (TD) schizophrenics exhibit attentional abnormalities related to increases in indirect (or *hyper*) semantic priming (Spitzer, 1996; Moritz *et al.*, 2001; Wentura *et al.*, 2008).

Munn (1973) described this broad “bringing together” of distant meanings undertaken by the shaman as (being at) “the center of convergent message fields, sensitive to the meaning all around him...he expresses and communicates, in direct contact with others through speech, an articulator of the unsaid who liberates by language and makes understood...Reality reveals itself through him in words as if it had found a voice to utter itself” (p. 114). Here, Munn is hinting at the semantic network as a “message field,” within which the shaman travels through meaning via their hypersensitive state of consciousness, but is, to some degree, able to *share* these extraordinary meanings, or thought associations, by speaking them as they come. It’s by way of these stream-of-consciousness chants that the hidden reality, revealed and revealed in during that ecstatic hypersensitive state, is transmitted from one person to another; an influence exerted over the patient’s state-of-consciousness, which requires a keen empathic sensitivity and receptivity to that participant’s condition in order to masterfully guide their inward experience using imagery and intention. The chants guide the individual, point by point, through disparate regions of the semantic network, *bringing things together* for the participant and revealing unity where only difference was seen.



Cognition Relative to Subtle Perception

The shaman must utilize and control considerable attention in his or her trance work and, as a practitioner of a specialized profession, is typically acknowledged as an intelligent and knowledgeable individual by their society; a respected authority, held in a similar regard to that of a Western physician. By utilizing focused attention within distinct states-of-consciousness, dream-like images and thought associations are not merely revealed, but navigated with intention behind his or her closed eyes. The shaman gains access to ranges of information not typically available from within the ordinary or baseline state-of-consciousness; that ordinary, waking state to which the other members of his society are limited. While the shaman, of course, exists and lives, works and loves within that ordinary waking state-of-consciousness, like everybody else, it is his ability to extend his attention, at will, beyond the boundaries of that sunlit physical range of perception that defines him, and his shamanic profession. Latent inhibition is the faculty of cognition which governs our access to those non-ordinary ranges of information and, by learning to lower his LI filter and carefully open the door of his perception – sometimes with the use of attentional aids like psilocybin – awareness and understanding of the subtle non-physical systems and spiritual ecologies of nature are revealed to him. With dedicated practice and continued self-discipline, his influence and masterful control over these systems is what make him a proficient spiritual healer.

Conclusion

States of hypersensitive perception and hyperprimed cognition are reliably induced by the consumption of the sacred Mazatec *teonanácatl*, or “Flesh of God” sacrament, and assumedly have been for the better part of a millennium. For this reason, theoretical models utilized in the investigation of perceptual or semantic processing abnormalities, like the spreading activation framework seen in the study of thought disordered schizophrenia, are also valuable tools to understand the influence of psilocybin on those same cognitive processes. The semantic hyperpriming and spreading activation paradigms may be interrelated by their alterations in the faculty of attention, as seen in the administration of psilocybin under controlled conditions. Extending this framework to

represent the changes in perception and thought association at the core of the traditional Mazatec *teonanácatl velada*, provides us with a systemic and quantitative means to better understand and further explore the subtle subjective mechanics of this ancient healing ceremony.



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