Article

A Scientific Study of Spirituality as the Foundation of Consciousness & the Core Component of Mental Health & a Meaningful Life

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ABSTRACT

Using Judaism as an explanatory model, this study demonstrates how consciousness is a construction of spirituality, spirituality forming the very foundation of our evolutionarily defined core behavior. This core behavior is integral to mental health while simultaneously susceptible to suppression and even distortion by socioenvironmental pressure. In this study, a neuropsychologist introduces the neuroscience-informed modality of Cognitive Neuroeducation (CNE) for the prevention of and recovery from mental disorder through the renewal of core human behavior, exploring the spiritual qualities embodied within mental health and well-being, tightly coupling spirituality and science toward understanding how we define and achieve a whole, self-actualized, meaningful life.

Keywords: Cognitive neuroeducation, neuroplasticity, synaptic strength modulation, long-term potentiation, long-tern depression, enriched environment, core behavior, self-renewal, well-being, Judaism.

Core human behavior as defined in Judaism and science

In his 2018 lecture entitled, *Can we ask about the 'whys' and the 'hows' of* Torah (the Five Books of Moses – the first five books of the Hebrew Bible) *and* mitzvos (the sacred duties of righteousness), *or do we have to accept it all without questions?* Rabbi Simon Jacobson states: "Questioning is a part of faith. It goes hand-in-hand – faith and reason – reason as a complement of faith." The balance between the Jewish tradition of faith and the natural human inclination to question and to strive for knowledge and enlightenment has long been, and continues to be, a topic of discussion among Jewish thinkers (e.g., Bronfman, 2013; Horowitz, 2005; Sacks, n.d.; Leener, 2017).

Putting this into a scientific, evolutionary perspective, both faith and reason are inherent components of the uniquely human social brain that directs our interpretive process in interacting with our environment (for studies on the uniquely human social brain, see, for example: Adolphs, 2009; Bhanji & Delgado, 2014; Blakemore, 2008 and 2010; Brüne, Ribbert, & Schiefenhövel,

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2003; Cozolino, 2006; U. Frith & Frith, 2010; Grossman & Johnson, 2007; Insel & Fernald, 2004; Kennedy & Adolphs, 2012; Lieberman, 2013; Saxe, 2006).

Insufficiently equipped to compete with other animal taxa (kinds) for survival on an individual basis, humans evolved to rely on the competitive edge of cooperative behavior in groups. This cooperative behavior is the driving force constituting the Jewish principle of *b'tzelem Elohim*, literally meaning 'in the image of *HaShem*' (*HaShem*, literally, 'The Name,' a traditional Jewish convention honoring the ineffable name of the Unimaginable Majesty) – the expression *b'tzelem Elohim* referring to the commitment to the conception that humankind was created in the image of *HaShem* [as proclaimed in *Bere'shit* (Genesis) 1:27], and that every human being should be treated with the reverence and dignity honoring the sacredness of that image.

B'tzelem Elohim further dictates that, as we are all created from a sacred image of humankind, we were all created to live and work together in harmony and cooperation to perpetuate humankind, and in this regard, a number of basic Jewish values and principles of life emerged: *chesed* – generally translated as 'mercy,' referring to compassion and caring for others; *g'milut chasadim* – acts of kindness, assistance and charity to others; *sh'lemut* – literally, 'wholeness' or 'completeness,' referring to the pursuit of wholeness through honorable actions; *amcha* – literally, 'your people,' referring to our sense of Jewishness that, though we are scattered across the globe, connects us together as one people from one generation to the next; *derech eretz* – literally, 'the way of the land,' referring to the inheritance of our shared Jewish tradition in the honoring of mutual respect of our fellow humankind and acceptance of responsibility in our daily actions in dealing honestly and with forbearance with others and following the secular laws and rules of the greater society in which we live; *tzedakah* – literally, 'righteousness,' referring to the obligation of the Jewish community to set an example of justice in the world; and *tikun olam* – literally, 'repair of the world,' referring to our obligation, collectively as a Jewish people and individually as Jews, to engage in activities directed toward righting the wrongs of the world (i.e., to take action against injustices and corruption, including the moral duty of engaging in conscientious and responsible social activism). These maxims are universal throughout the various denominations of Judaism. From an evolutionary perspective all of these Jewish values are in fact inherent qualities that define us as human; i.e., behavioral dispositions of group unity and solidarity that evolved to give competitive advantages that enabled our taxon (*Homo sapiens sapiens*) to survive (*b'tzelem Elohim* – in the image of *HaShem* for the sake of humankind).

These core behavioral dispositions evolved as pseudo-fixed action patterns defined as engrained behavioral tendencies, that, rather than fixed action patterns of nonhuman animals – i.e., hardwired, preprogrammed automatic responses (as first described by Lorenz, 1970, pp. 316-350) – are, in humans, more prone to mediation by genotype (genetic composition) and phenotype (the interaction between genetic composition and environmental and experiential factors), and may even be entirely overridden by experience (as learning outcomes), stressing the flexibility of human behavioral response, with its dependency on learning [the cognitive imprinting in the codifying of all experience from sense-given impressions of external stimuli and the interpretation thereof in ideational constructions of meaning through internally configured associations (see Wood, 1942)] and, consequently, the susceptibility of human behavior to molding by environmental influence.

As an evolutionary biological determinant of survival, the uniquely human social brain evolved highly flexible behavior through pseudo-fixed action patterns – including the acute stress response (fight-or-flight response), attachment/bonding response, mating (procreative) response, tend-and-befriend response, etc. – to adjust to changing environmental conditions and to allow adaptation to the widest variety of habitats, overcoming the limitations of the fixed action patterns that regulate behavior in nonhuman animal taxa. Fixed action patterns regulating behavior in nonhuman animals, while eliciting behavior finely tuned to adaptation to a very specific habitat, are unresponsive to environmental changes, whereby the preset behavioral patterns may become ineffective or maladaptive in the changed environment such that even small environmental changes may lead to taxon extinction. Rather than a fixed preadaptation to a specific habitat, humans evolved to ***learn*** to adapt to the widest variety of habitats by the creative use and manipulation of the resources available within and in the vicinity of their habitat through curiosity, inquisitiveness, imagination, creativity and reasoning. With a critical dependence on 1) learning as the mechanism for adaptation to the widest variety of habitats, and 2) cooperation as the key to human survival, the neurophysiological system of the uniquely human social brain became organized for the optimization of the facility and flexibility of learning and the orientation towards social behavior and structures of community.

By cooperative behavior facilitated by language, which led to both higher-order reasoning and tool-making flexibility to manipulate their environment, humans were able to out-strategize, out-plan, out-maneuver, and simply out-think their taxonomic rivals for survival. Humans organized in groups such as bands or tribes also competed against each other – group against group – in a particular habitat or region, so that social cohesiveness as well as role and skill diversification and skill expertise within a group leading to more specialized supportive social structures became the keys to group survival that pushed evolutionary determinants toward the human tendency for more sophisticated, intricate and complex social organization.

So-called 'morality' evolved as a condition of group survivability. Such so-called human 'virtues' as courage, love, compassion, forgiveness, charity, mercy, consideration, honesty, honor, selflessness, steadfastness, loyalty, self-sacrifice, etc., that though became instituted in codes of behavior in the formulation of social order and sacred ideals of religious conviction, stem from *natural* tendencies embedded within the pseudo-fixed action patterns and cognitive constructions of the uniquely human social brain that are designed to solidify group cohesiveness and effectiveness in maximization of the competitiveness of a group. The greater these qualities among its members the stronger the group; conversely, the degree to which they are lacking among the members of a group (be it a mating pair, a family, a band, etc.), the less a group is able to work together effectively and benefit from the interrelationships of its members.

For basic human survival:

1) learning became the central operating principle of the uniquely human social brain;
2) curiosity or inquisitiveness in response to novelty became the driving force of learning;
3) logic and reason became the principal method of understanding;
4) and affective state (emotive response) became the mechanism mediating the balance between understanding and action.

Affective (emotive) qualities constitute essential components of pseudo-fixed action patterns, such as fear, anger, rage, hate, aggression and violence in the acute stress response and love, compassion, empathy, concern, and selfless, protective loyalty in the attachment/bonding response and the tend-and-befriend response, etc. While the predisposition of affect is an innate biological determinant of human behavior, the individual capacity for and/or particular nature of affective reaction is mediated by genotype and phenotype to the extent that each individual possesses a unique basic affective profile. Individual affective reaction is highly malleable, and is learned or modified through experience such that highly indoctrinated societies can skew mass behavioral tendencies.

Cognitive and behavioral disorder

In human pseudo-fixed action patterns behavioral flexibility and inventiveness can respond as group action while maintaining basic individual core principles of social cohesiveness and harmony in meeting changing environmental demands, but, on the other hand, such behavioral flexibility is equally responsive to pressures of conformity and pervasive social indoctrination that can mold individual characteristics to such extent that basic natural or core dispositions are altered, subverted or completely overridden, skewing the very nature of individuals, of groups, and even of entire societies, toward mindsets and behavior antithetical to core values, leading to cognitive and behavioral disorder (i.e., so-called 'mental disorder') in individuals and/or 'sick' (i.e., dystopic, dysfunctional or nonsustainable) societies.

The brain of the anatomically modern human is a biologically evolved social brain, whereby all voluntary (consciously directed) human behavior, including social interaction, is learned. In the human social brain all learning is grounded in and constructed from a social context (the very basis of self-identity) and all positive learning – i.e., learning consistent with core values and cognitive growth – occurs in a normative positively stimulating environment or, in negative learning – i.e., learning inconsistent with core values and/or cognitive growth – in an impoverished environment ('impoverished environment' referring to a dearth of positive stimuli as experienced in a corrosive, threatening, confined, isolating or otherwise psychosocially inhospitable or deprived, barren environment). Impoverished environments as well as different forms of diseases or organic disorders resulting in cognitive neurophysiological disturbance can lead to cognitive and behavioral disorder; i.e., so-called "mental disorder."

Since our behavior is defined by our learning experiences, in addition to effective treatment for any organic pathology, recovery from cognitive and behavioral disorder requires relearning and more intensive positive stimulation than in normative learning in order to trigger a stronger neurophysiological response to rebuild stagnant cognitive neurocircuitry and/or rewire cognitive connections from negative (i.e., maladaptive or distorted) cognitive constructs to positive cognitive constructs (cognitive constructs = conceptual orientations) and override and transform negative behavioral patterns set through the previous negative experience. The design, content and application of such a more intensive positive stimulation or positive learning environment, is referred to as the 'enriched environment' (for studies on the enriched environment and its efficacy in recovery from cognitive and behavioral disorder, see, for example: Alwis & Rajan,

2014; Hannan, 2014; Kleim & Jones, 2008; Kleim, 2011; Sampedro-Piquero & Begega, 2017; Nithianantharajah & Hannan, 2006 and 2009; van Praag, Kempermann, & Gage, 2000; Hebb, 1947; Taubert, Villringer, & Ragert, 2012; Draganski & May, 2008; May, 2011; Pascual-Leone, Amedi, Fregni, & Merabet, 2005; Woo, Donnelly, Steinberg-Epstein, & Leon, 2015; Sweatt, 2016).

An enriched environment is the primary foundation of Cognitive Neuroeducation (CNE), a rigorously researched cutting-edge, neuroscience-informed modality for the prevention of and recovery from cognitive and behavioral disorder. The CNE enriched environment is one that has constancy, creates a bonding group dynamic, provides fun, engaging and challenging eclectic learning experiences and is positive, reinforcing, stimulating, rewarding, encouraging, supportive, and full of possibilities. In the CNE program we explore together conceptualizations, beliefs, modes of social interaction and interpersonal relationships, reactions to situations, emotive contours, flights of imagination, aesthetic visions, creative artistry and nuance, duty, purpose, loyalty, love, spirituality, sense of destiny and myriad other products of the mind that define the true essence of being human in understanding others and discovering or rediscovering ourselves through games, stories, group outings, music, skits and drama, motion picture films and dance, study sessions and discussion, debates, etc.

We are normally born with a pseudo-fixed action pattern of curiosity about our environment and the world we live in. This curiosity or inquisitiveness, this fascination for the answers to the mysterious and the unknown, this striving to know and understand, this questioning and great wonder and delight of discovery is an inherent part of being human manifest from infancy, becoming the dominant preoccupation of early childhood. This innate curiosity was the spark that ignited exploration, discovery and creative manipulation of natural resources that enabled humankind to adapt to diverse habitats, an essential feature of our evolutionary survival. In the modern formula-driven, staid curriculum of education reinforcing the artificiality of the modal socialization of mass consumerism, our innate curiosity is suppressed and largely overridden by force-fed narrow concepts, empty sound bites, dissociated ‘facts’ and rote stereotyped surface role-playing by the time we reach adulthood in the impersonal, hype-infused, small-minded, electronic-media-inundated anonymity of modern urbanized daily life. If, however, our natural curiosity and questioning is nurtured it may be maintained throughout life, and through CNE can be regenerated in adulthood, fostering creativity; an open, receptive mind; critical thinking; and an ongoing love of learning.

The Jewish tradition of learning as mirrored in CNE

In the Jewish tradition, learning and education, questioning, the continual seeking of more definitive answers, and the honing of the intellect, are revered and assimilated into the religious practice itself as exemplified in consideration of the *Talmud* (the collection of the commentaries of the noted rabbis of the ages in the interpretation of the Scriptures) as a process, not a product, as summed up in the phrase ‘turn and turn the *Torah*.’ In the study of the *Talmud*, when an answer to a question is developed, it is not the end, but only the beginning of a new question using the principles and techniques of hermeneutics and the hermeneutic circle in the deep

analysis of the Talmudic text in the questioning and revisiting of the meaning underlying grammatical construction and every term, expression, generalization or exception and all the interrelationships thereof. The Talmudic way of thinking is the seeking of ever-new ways to see.

This thinking is paralleled in the CNE curriculum based on learning as the mechanism for the remediation of and recovery from cognitive and behavioral disorder and sees the accumulation of learning, that is, knowledge itself, as composed of relative truths, as all things may be understood from many different starting points, frames of reference and personal perspectives. Being relative does not make these 'truths' any less real to the frames of reference in which they reside. The full recognition of this relativity leads to the undeniable, stirring realization that there are so many more, endless things to discover, so many more, endless ways by which to view all phenomena, so many more, endless ways to think about life and all its mysteries and so many more, endless contributions to knowledge waiting for eager, imaginative, curious, probing, questioning minds to reveal.

The CNE activities, related materials and group dialog explore the different realms of understanding and knowledge from the widest possible perspectives, stimulating each of the group members with the awe of the vast potentials of discovery, of endless paths on the journey through life, and the eager anticipation of the possibilities waiting beyond the bend in the road on the great adventure of being. While invisible to the CNE participants, this exploration seamlessly blends hermeneutic techniques and exegetic principles in the group dialogs and interchanges between the CNE participants in questioning, probing and debating in the quest for understanding the various scenarios, situations and responses encountered in the CNE activities, thus realizing the many considerations, nuances and different sides that may reside in any question. We live within our mind and the journey of life continues on in elderhood and even in infirmity of body through a healthy, active mind and an environment arousing our innate curiosity and deep human need to communicate, share experiences, exchange ideas, work through challenges and involve ourselves with others.

Faith and the scientific method

Faith is the very cornerstone of this journey through life. Quite contrary to the common myth that faith is antithetical to reason and the anathema of science, faith is the very foundation of science and the thread of life that ties together the binary constructs of reason (rationality) and spirituality, intellect and emotion, practicality and idealism, common sense and imagination – the paradoxes that form the very essence of being human. Let us consider science then in understanding this critical role of faith.

According to a rigorous interpretation of the scientific method, science is defined as possessing the following qualities:

1) it is *empirical*: based on actual experience
2) it is *rational*: following the rules of logic and consistent with known facts, subject to change as new evidence dictates

3) it is *testable*: verifiable by experimentation – it is possible to imagine ways that scientific theories and hypotheses prove invalid
4) it is *parsimonious*: the explanations must be simple in that they involve few assumptions; i.e., solutions must be tightly constructed in which all facts are accounted for in a seamless logical progression of cause and effect, and considered invalid if any elemental facts do not fit in and/or fundamental questions remain unanswered
5) it is *general*: theories work for a relatively wide range of phenomena
6) it is *tentative*: theories are readily abandoned when confronted by new, refuting evidence
7) it is *rigorously evaluated*: hypotheses are continuously subject to testing, retesting and modification

The rigorously logico-deductive scientific model of hypothesis testing is constructed as follows:

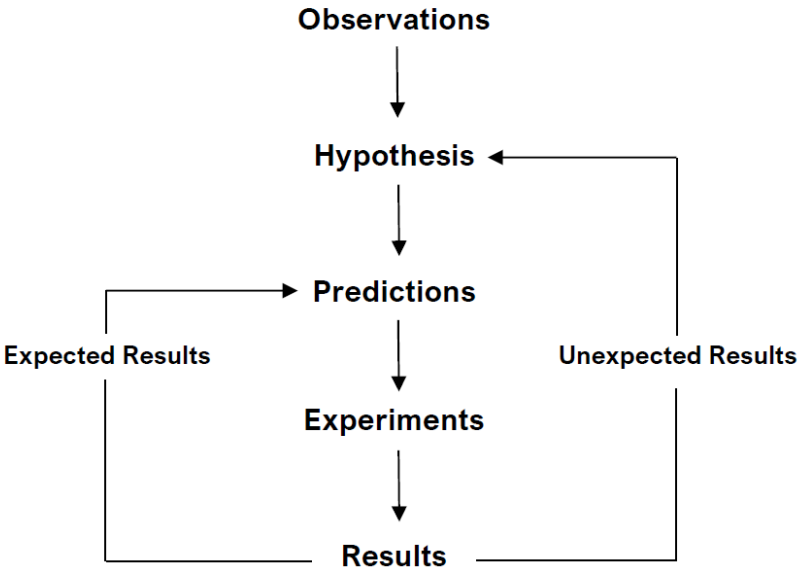

Figure 1. The Scientific Method: The Steps of Hypothesis Testing

As the diagram above shows, hypotheses testing, and therefore, scientific results, are never finalized or proven, they are simply approximations of the rules governing observed phenomena that represent our current understanding of the mechanisms of physical properties. Testing, probing and questioning are ongoing processes of experimentation in 1) either the revision of hypotheses in the event of unexpected results, or 2) in new predictions in the event of expected results, digging deeper into ever more detailed understanding of a phenomenon and its relationship with other phenomena. There is no end to the accumulation of knowledge or learning, and within scientific study, no absolutes, only different ways of understanding and new relationships and new concepts to be discovered. This comports with the tentative nature of science that, in point 6 above, maintains that theories are readily abandoned when confronted by new, refuting evidence, and in point 2 maintains that scientific understanding is subject to change as new evidence dictates. This never-ending cycle of testing also follows the tenets of science in points 1, 3, and 7, that all scientific statements are testable, based on actual experience (i.e., experimentation) and are continuously subject to testing, retesting and modification in a restless dialectic.

However, in science, as well as in all efforts of understanding, every problem, idea or observation is seen in light of some intrinsic basic assumptions stemming from an adopted worldview. Every scientific endeavor, every experimental design, must start with some basic assumptions. Basic assumptions include underlying tenets concerning questions of primary concepts. In science, for example, we must make some assumptions regarding such questions as: 1) is there an outside intelligence operating, or is the system closed, depending only on internal known laws? 2) are the laws of nature constant everywhere? 3) were the laws of nature in the past the same as they are now? 4) what initial conditions are assumed as base phenomena? Science does not, and cannot, take place in a vacuum – an underlying worldview, i.e., belief system, a faith in some view of the basic agent or agencies which regulate the world, is presupposed.

The belief system upon which modern logico-deductive science rests is known as naturalism and is based on the ***faith*** that 1) the entire universe can be explained entirely on the basis of physical realities plus time plus chance and 2) that the laws of physics have never changed since the beginning, so that the evidence revealed by experimentation in the modern natural world can be applied to explain past conditions as reliably as today's conditions. This ***faith***, however, is being challenged by new evidence that suggests that perhaps the laws of physics have indeed changed over time and that some so-called mathematical constants are actually fluctuating values (Moscovitch, 2013). While this new evidence challenges some basic scientific concepts and implies how we might need to rethink some of the tenets of science and some of the processes of the scientific method, scientific thinking and the fundamental philosophy of the scientific method, when rigorously applied, offer the most systematic, credible, rational and precise way to explore and unravel the mysteries of the physical world, as science demands, first and foremost, that all results must be able to be repeated without fail and therefore, be fully verifiable to others, and that a problem and its experimental design be constructed around a phenomenon in which large amounts of data are available, as the results from small amounts of data are inconclusive since small sampling populations are statistically meaningless.

Science, then, by its own rigorous mandates, is, by definition, limited. Although qualitative research as a model of enquiry is gaining traction among the social sciences, it is still largely dismissed by the more quantitatively oriented scientific disciplines due to the lack of rigor in theoretical grounding, analysis, replicability and intersubjective verification in much of the corpus of qualitative research studies. However, qualitative research rigorously following the hermeneutic triad of *claims*, *evidence* and *warrants* and the *hermeneutic circle* (see Robinson, 2012, pp. 1-2 and pp. 9-10) not only incorporates many of the principles of the scientific method, but can even exceed its rigor, and, freeing research results from dependence on statistical evaluation, opens up a much wider field for scientific investigation. Such a wider field of exploration may embrace such areas as 1) deeper and more experiential explorations of the mind, behavior, and theology; 2) cognitive interpretation of history, art, music, dance and literature; 3) mysticism, metaphysics and the essence of being, and spirituality (as inclusive of but a broader phenomenon than religion per se); and 3) semantics and the meaning of meaning and other areas of fundamental critical and compelling concern and interest beyond the material arena of the physical world (see Robinson, 2012 and 2008/2010, respectively, for 1) a description of an exclusively hermeneutic, scientifically rigorous qualitative research model; and 2) a comprehensive study rigorously employing that exegetic model).

From the above, we see how faith anchors science – the most rational, evidence-based process of thinking and understanding. Without faith, there can be no science, as reason itself is the principal method of the uniquely human social brain in understanding the world in which we live, and faith is an intricate component of reason as faith establishes a world-view, the essential platform upon which rational explanation may begin – the fundamental concept of order: the starting point of speculation, questioning and exploration – the belief and trust in some order and agency by which phenomena may be explained and understood. This vital aspect of faith molds our cognitive constructions such that understanding is founded on the unquestioned (faith-based) acceptance that there is some order or plan, that is, governing principles, that constitute the arrangement of our world – not only the order that we find in nature, but equally the order that we inherently generate from the constructs of our socially oriented brain in molding our social structures.

The agency by which this order is established becomes the central question of faith. Is this order 1) the result of the laws of nature as discovered and explained by science, though many things remain unexplained and perhaps unexplainable by science? 2) the result of the laws of nature that can be explained by science, but also extend beyond the reaches of science, with the laws themselves originating from and governed by a Being – a Deity, unfathomable, omniscient, omnipotent, eternal, the Creator of all? 3) the sole result of the will of the Creator? 4) the result of some essence that surrounds us and resides within us all and which we are an integral part of – an ethereal or incorporeal thread connecting all things and from which life and all matter emerges – an agency that we might simply refer to as Nature, constituting the interconnection of all things?; 5) or is it some combination of the above or something else entirely, or perhaps all the same seen from different viewpoints?

The phenomenon of faith and its relation to intellect and understanding is put into a Jewish perspective by the former Chief Rabbi of Britain, Lord Jonathan Sacks, as follows:

> The historian Paul Johnson once wrote that rabbinic Judaism was "an ancient and highly efficient social machine for the production of intellectuals." Much of that had, and still has, to do with the absolute priority Jews have always placed on education, [secular] schools and the bet midrash [a bet midrash is a Jewish study hall located in a synagogue or specialized school of Jewish religious study] – religious study seen as an act even higher than prayer, learning as a lifelong engagement, and teaching as the highest vocation of the religious life. (Sacks, n.d. – insertions in brackets mine)

"But much too has to do with how one studies and how we teach our children. The *Torah* [refers to] the most powerful and poignant juncture in Jewish history – just as the Israelites are about to leave Egypt and begin their life as a free people under the sovereignty of God;" Moses entreats the Israelites to "Hand on the memory of this moment to your children," – but not in an authoritarian way – rather in the encouragement of our children "to ask, question, probe, investigate, analyze [and] explore. Liberty means freedom of the mind, not just of the body. Those who are confident of their faith need fear no question. It is only those who lack confidence [i.e., real faith], who have secret and suppressed doubts, who are afraid [to question]" (Sacks, n.d. – insertions in brackets mine).

> **Note**: I have inserted explanations for clarification in certain quotations, and, because of the difference of expression used in liturgy and Scripture as opposed to theology, and the common conflation of liturgy and Scripture with theology in religious writings,

> to maintain consistency with the language of the central theological theme presented herein, that of the nameless indefinability of the Great Absolute, I have substituted or added words in certain quotations, preserving the meaning, and hopefully balancing the 'flavor' of the original text, with that of the prevailing theological theme in each instance.

As Rabbi Sacks (n.d.) states, it is important to recognize, and to teach our children, "that not every question has an answer we can immediately understand. There are ideas that we will only fully comprehend through age and experience, others that take great intellectual preparation, yet others that may be beyond our collective comprehension at this stage of the human quest. . . In teaching its children to ask and keep asking, Judaism honored what Maimonides [Rabbi Moses ben Maimon] called the 'active intellect' and saw it as the gift of God [the 'active intellect' is discussed by Maimonides in Part 2, Chapters 36-37 of his circa 1190 tome *The Guide for the Perplexed* – a very accessible English translation of which may be found in Friedländer, 1904, pp. 225-229 – in Scripture, the gift of the intellect is included in the 'seven gifts of the spirit of *HaShem*' in *Nevi'im* (Isaiah) 11:2-3, in which four of the seven, i.e.; wisdom, insight, counsel and sense of truth (the latter two consisting of prudence and the perspicacity of inference and penetrating judgement), are all manifestations of the intellect (see Jewish Publication Society (JPS), 1999/2000, p. 870)]. No faith has honored human intelligence more" (insertions in brackets mine).

Judaism itself then is a religion based on intelligence, reason and faith, equally valued. In honoring the 'active intellect' as the gift of *HaShem*, understanding becomes the avenue by which we exercise our faith – coming closer to *HaShem* and embracing existence itself by striving to ever more deeply discern the mysteries of *HaShem*, the meanings and appropriateness of the *Tanakh* (the complete 24 books of the Hebrew Bible), the *Halacha* (the collective body of Jewish religious laws), the *Musar* literature (the didactic Jewish ethical literature which describes virtues and vices and the path towards perfection) and our duties and responsibilities, not only as Jews but as citizens of a society and as members of the human race.

Our faith is based on our belief that, as Rabbi Sacks (n.d.) states, ". . . intelligence is [*HaShem*'s] greatest gift to humanity" and "Judaism a faith that is centered on asking questions, sometimes deep and difficult ones that seem to shake the very foundations of faith itself. . . Rashi [Rabbi Shlomo Itzhaki] understands the phrase that [*HaShem*] made man 'in His image, after His likeness,' to mean that [*HaShem*] gave us the ability 'to understand and discern.' The very first of our requests in the weekday *Amidah* [*Tefilat HaAmidah*, 'The Standing Prayer,' the central prayer of the Jewish liturgy] is for 'knowledge, understanding and discernment. . .'" There is no word in Biblical Hebrew that means 'to obey' [that is, in the sensu stricto of a forced act of absolute, unquestioning compliance]. "When Hebrew was revived as a living language in the nineteenth century and there was need for a word meaning 'to obey,' it had to be borrowed from the Aramaic *le-tsayet*. Instead of a word meaning 'to obey,' the *Torah* uses the verb *shema*, untranslatable into English because it means 1) to listen, 2) to hear, 3) to understand, 4) to internalize, and 5) to respond. Written into the very structure of Hebraic consciousness is the idea that our highest duty is to seek to understand the will of [*HaShem*] [i.e., to delve into the mysteries of the principles, construction and metaphysics of the order of The Great Design], not just to obey blindly" (insertions and substitutions in brackets mine). Note that Maimonides

discusses more nuanced meanings of 'obey' and the Hebrew word '*shema*' in *The Guide for the Perplexed*, Part 1, Chapter 45 (see Friedländer, 1904, pp. 58-59).

Simply because we use the masculine personal pronoun to refer to *HaShem* does not mean that *HaShem* is male or can be identified with any attributes that we can define within the limitations of language constructed by mortal man, it only means that we have no non-gendered pronouns that we can use to refer to *HaShem*, as the neuter pronoun 'it,' redolent of the insentient, would be disrespectful, even blasphemous, so, traditionally, from the ancient patricentric Near Eastern culture of the Biblical Lands, the male personal pronoun was adopted in early Judaism to refer to *HaShem*. But though *HaShem* may be defined as a mysterious absolute beyond human contemplation, we certainly must try to understand *HaShem* up to the very boundaries of human limitation, as understanding is a form of connecting, adoration and respect; the striving for understanding then the path to internalize as much of the absolute of *HaShem* as our human intellect allows. The more we know about that Absolute and understand it, the more we can engage the essence of all things, of which we ourselves are a part, and merge its connection with us into our perspectives of life.

The 'absolute' in Jewish mysticism and in science

The question of what constitutes an 'absolute' is highly contentious and lies outside the purview of the quantitative scientific method and outside of the capacity of comprehension of mortal man, like 'infinity' or 'nothingness' – though such words themselves are understood as superficial concepts, their reality is beyond human contemplation (to illustrate, try to visualize what the concrete reality of nothingness or infinity would be like; a condition without time? without cause and effect relationships? without beginning or end? without boundaries or development or growth? a condition without conditions?). While *HaShem* is an example of an absolute beyond human contemplation, we may still gleam important, vital concepts by carefully probing aspects of The Elemental Vitality such as defined by Maimonides in Part 1, Chapter 50 of *The Guide for the Perplexed* (as translated in Friedländer, 1904, p. 67), where Maimonides states: "Those who believe that [*HaShem*] is One [and has] many attributes, declare the unity with their lips, and assume plurality in their thoughts" (substitutions in brackets mine). Since *HaShem* is thus described in contradictory terms, Maimonides concludes that one cannot describe or define *HaShem* in terms of positive (that is, definitive) attributes, but can only consider *HaShem* in terms of negative attributes, that is, what *HaShem* is not, such as not corporeal but an Absoluteness of One, a Singularity, having no parts, no arms, no legs, no back, no front, no end or beginning – an Essential Impetus that does not occupy space, has neither generation nor corruption (i.e., is everlasting – never born, never aging, fading, or deteriorating – an Eternalness). The nature of *HaShem* is so far beyond the realm of human existence that it is unimaginable, unfathomable, incomprehensible to human conception, and therefore utterly beyond description, as *HaShem* is revealed to Moses as Nameless, related in *Shemot* (Exodus) 3:13-14, as follows: [13]"Moses said to [*HaShem*], when I come to the Israelites and say to them, 'The [*Guiding Light*] of your fathers has sent me to you,' and they ask me, 'What is His name? what shall I say to them?'" [14]"And [*HaShem*] said to Moses, 'Ehyeh-Asher-Ehyeh.' He continued, "This you will say to the Israelites: 'Ehyeh sent me to you'" (Jewish Publication

Society [JPS], 1999/2000, p. 117; – substitutions in brackets mine – JPS notes that the meaning of *Ehyeh-Asher-Ehyeh* in Hebrew is uncertain, but is conventionally translated variously as "I Am That I Am," "I Am Who I Am," or "I Will Be What I Will Be," with *Ehyeh* variously translated as "I Am" or "I Will Be"). Furthermore, in regard to the indescribable nature of *HaShem*, *HaShem*'s very attributes are proclaimed in *Kethuvim* (Psalms) 145:3 and 147:5 as unthinkable, as follows: 145:3, "Great is [*HaShem*] and much acclaimed; His greatness cannot be fathomed" (JPS, 1999/2000, p. 1592 – substitution in brackets mine); 147:5, "Great is our [*HaShem*] and full of power; His wisdom is beyond reckoning" (JPS, 1999/2000., p. 1594 – substitution in brackets mine).

As regards 'faith' in the Jewish tradition, Maimonides writes, "All we understand is the fact that [*HaShem*] exists, that [*HaShem*] is a Being to Whom none of [*HaShem's*] creatures is similar, Who has nothing in common with them, Who does not include plurality, Who is never too feeble to produce other beings, and Whose relation to the universe is that of a steersman to a boat: and even this is not a real relation, a real simile, but serves only to convey to us the idea that [*HaShem*] rules the universe: that is, that [*HaShem*] gives it duration, and preserves its necessary arrangement" (*The Guide for the Perplexed*, Part 1, Chapter 58, as translated in Friedländer, 1904, p. 83 – substitutions in brackets mine).

Faith is an essential component of spirituality and an inherent component of emotion, intellect and reason. This may be understood from an evolutionary perspective in the recognition that spirituality evolved as the vehicle driving the uniquely human social brain's orientation towards cooperative behavior through the dual impulse of 1) commonality, community, connectedness – the basic urge of transcendence, to go beyond the confines of self to connect with others, to bond, identify with and feel part of a group and of a larger wholeness, to connect with all that there is; and 2) curiosity and reason – the striving to know and to understand, to delve into the deeper mysteries of life, to get closer to the truth of existence and the origin of all things. These dual impulses of transcendence, that combine connectedness and inquisitiveness working together in the yearning of belonging, of sharing, of purpose, of meaning – propel the quest of the intellect and reason to understand what it means to be alive, to be human. Spirituality and its essential component of faith constitute that core of being that defines us as both human and each of us as a distinct, individual psyche that belongs to and is part of the very fabric of the world in which all life and all manifestations of nature are interwoven while simultaneously constituting our individual uniqueness and the need to define our individual, unique, special place within the universality of existence.

Jewish mysticism delves deeper into the very fabric of existence through the Kabbalah and other metaphysical texts, opening the door to a process of discovery in learning and knowing the revelations of *HaShem* and the mysteries of the universe in deep, intense study through the channels of inner contemplation and intellectual abstraction. This journey of discovery begins with the concept of the Nothingness of the Prime Force (*Ayin*) and its emanation into levels of knowing as revealed through the *Sefirot* (the finite receptors of the emanations of *Ayin*).

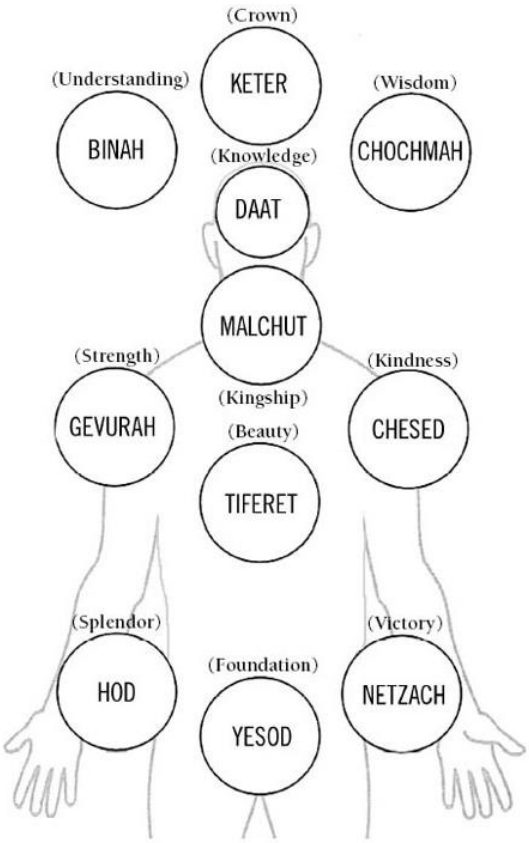

Figure 2. The Sefirot of the Kabbalah
Source: Dubov, Nissan Dovid. (n.d.). *The Sefirot*.
https://www.chabad.org/library/article_cdo/aid/361885/jewish/The-Sefirot.htm

Because the Great Absolute is so distant in reality from everything else, all else being only finite emanations of the Great Absolute, the Great Absolute, far beyond the frame of reference of human knowing, has been referred to in Hebrew by the Jewish mystics as *Ayin* (nothingness), meaning the Great Absolute is so far beyond anything that one could imagine, that the Great Absolute is like *no thing*, no other – nothing can compare with this absoluteness. *Ayin* has also been conceived as a nonbeing, and even a nonentity; i.e., an existent nonexistence, the Great Paradox of Paradoxes [as Plotinus states, The One surpasses our most basic and cherished categories such that "even being cannot be there" (as cited in Matt, 1988, p. 43) – a concept echoed by the Byzantine theologian Gregory Palamas, who wrote that "the One is not being if that which is not the One is being" (as translated in Sinkewicz, 1988, Chapter 78)] – a closed, sealed, unknowable Absolute, closely associated with the *Ein Sof* (without an end – infinity), a single infinite unity beyond any description or limitation. The *Keter* (crown) bridges the process of the unfolding of the *Ayin* with the *Sefirot* (the repository in the finite world of the emanations from the unfolding). The process of the unfolding is referred to as *Yesh me-Ayin* [something from nothing – beginning with a contraction (*tzimtzum*) providing an empty space for the unfolding leading to the Creation (creatio ex nihilo), the Big Bang)]. The *Keter* is intermediary between the *Ein Sof* and *Chochma* (wisdom), the first of the *Sefirot*. As a supreme revelation of the *Ohr Ein*

Sof (Infinite Light – the infinite "dispersion" of the emanations of *Ayin*), the *Keter* is deemed to transcend the manifest *Sefirot* (the finite receptors of the emanations of *Ayin*) and is therefore considered distinct from the *Sefirot* in some interpretations and interchangeable with *Daat* (knowledge) in others. Though each of the *Sefirot* is identified by a specific number and position on the Kabbalah Tree of Life and by specific names that constitute particular literal meanings, they assume different nuances of meaning in multiple planes of manifestation both individually and in different interconnections between them.

The Jewish mystical modal of the creation of the universe accepts, from both a spiritual and intellectual epiphany through a transcendental connection, that both the pre-creation condition representing the Singularity of an unknowable Nothingness, and the unfolding of the emanations of *Ayin* out of nothing (i.e., the creation of the universe) are mysteries and processes beyond human knowing. While the scientific concept of the Big Bang seeks to unravel the mystery of the creation of the universe, it nevertheless postulates the creation of the universe from an unknown state followed by a hot and dense condition preceding the Big Bang (see Lincoln & Wasser, 2013). Like the Jewish mystical model, the initial condition in the scientific model of the creation, then, is an undefinable state in the Big Bang theory or, in the case of the CEN theory, a condition of nonexistence (CEN referring to *C*reatio *E*x *N*ihilo – creation out of nothing).

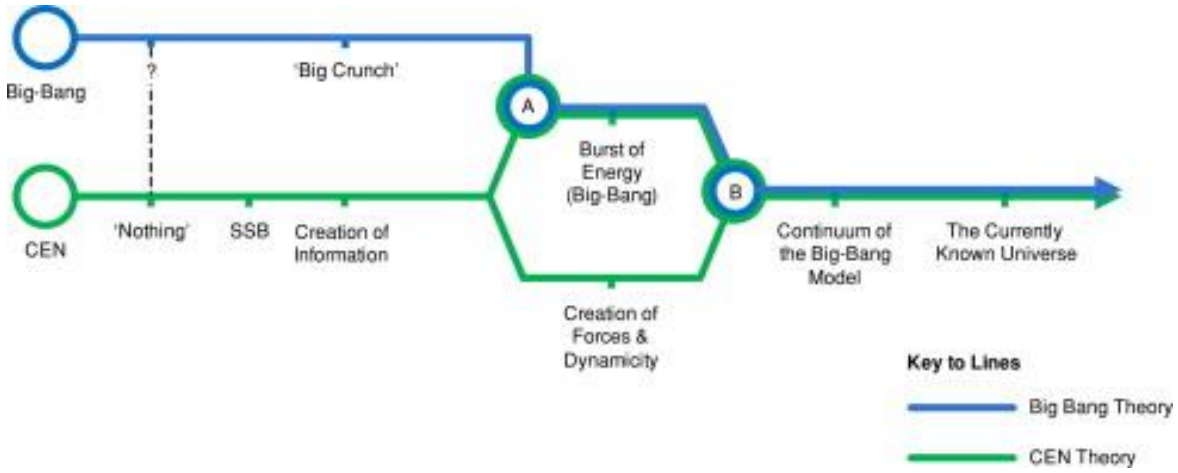

Figure 3. A schematic route map of the Big-Bang theory and the CEN theory in Lincoln & Wasser, 2013

"The Big Bang theory has been extremely successful in correlating the observable properties of the universe with the known underlying physical laws. Yet, this theory cannot describe what came before the Big Bang event and also what happened during the first miniscule time fraction after the initial Big Bang (Planck time)" [Lincoln & Wasser, 2013]. The Big Bang event itself is comparable to the series of transitions comprising *tzimtzum*/*Yesh me-Ayin*/*Ohr Ein Sof*/*Keter*/*Chochma*. Both the Big Bang and Creatio Ex Nihilo (CEN) scientific theories of the creation of the universe hinge on the assumptions of "a preliminary state prior to creation. Nevertheless, theories that require initial conditions are not considered complete since they lack an explanation of what created such conditions" (Lincoln & Wasser, 2013).

Both the CEN and Big Bang theories assume a nebulous precondition (an Unknown in the case of the Big Bang theory and a Nothingness in the CEN theory) and provide no explanation or cause for the transition from a preexisting state to the state providing the conditions leading to the state of creation, suggesting a correspondence with the Jewish mystical model in the proposition of the creation of something out of Nothing – the Creation emanating out of some undefinable, transcendental Great Void. While there are no definitive intersubjective criteria for equating metaphysical phenomena with purely physical events, especially in the consideration of a pre-physical void wherein neither time itself nor cause and effect exists under the same laws as the physical world, there are however plausible parallels that can be rationally conceived in correlating the Kabbalistic conception of the creation of the universe with that of the two prevailing scientific theories.

Referring to Figure 3 above of the parallels and divergences of the streams of the two scientific theories of the creation of the universe, 'SSB' on the CEN line refers to Spontaneous Symmetry Break – cosmological phase transitions in the early universe produced by the spontaneous breaking of a fundamental symmetry. It is plausible to consider that the point of SSB on this line corresponds to the *tzimtzum*, whereas the 'Big Crunch' on the Big Bang line would correspond to the combination of *tzimtzum*, *Yesh me-Ayin*, and *Ohr Ein Sof*, with the 'Creation of Information' on the CEN line corresponding to the combination of *Yesh me-Ayin* and *Ohr Ein Sof*, and the 'Creation of Forces & Dynamicity' on the CEN line and the 'Burst of Energy' ('Big Bang') on the Big Bang line corresponding to the *Keter*, with point A representing the second or final phase of unfolding leading to the Big Bang or moment of creation, and point B representing the manifestation of the *Sefirot*, the transference of the emanations of *Ayin* thereto, and the coalescing of the finite world – critical points of the Kabbalistic model of the creation of the universe paralleling that of both the Big Bang and the Creatio Ex Nihilo scientific theories.

In the *Ayin*, the *Ein Sof*, the *Ohr Ein Sof*, and the *Keter*, the Kabbalah explores the Infinite. From out of the infinite the *Sefirot* and the world of humankind arises. Referring to Figure 2 of the chart of the *Sefirot of the Kabbalah*, the Kabbalah represents the ethical properties in the different aspects that comprise righteousness. Loving kindness in *Chesed*, and justice in *Gevurah* (strength) are both mediated by compassion and mercy (*rachamim*). These nurturing affective (emotive) states are embedded within the attachment/bonding response and the tend-and-befriend response, pseudo-fixed action patterns that evolved in the anatomically modern human to foster social connection and cooperative behavior in the construction of well-knit social groups – the key to the survival of the human taxon. These pseudo-fixed action patterns form an integral part of an individual's *natural* or core disposition developed through nurturing and multifaceted experience (learning) and maturation in the context of positive social interaction.

The Sefirot and the CNE enriched environment

When cognitive growth is forestalled or one's core disposition is threatened and compromised past a cognitive/neurophysiological threshold by a negative environment, or distorted by organic pathology, cognitive and behavioral disorder emerges. To restart stagnant cognitive processes or reconfigure deleterious cognitive constructs in rewiring cognitive connections from negative (i.e.,

deficient or distorted) to positive cognitive constructs in cognitive and behavioral disorder requires a more intensive stimulation than the normal incidental experiences of pure chance and life choices. This dedicated, more stimulating learning environment is referred to as the *enriched environment*. In recovery from cognitive and behavioral disorder, the modality of Cognitive Neuroeducation (CNE) restores the individual's core disposition through an *enriched environment* of learning framed within an engaged group dynamic revolving around a central theme of perspective taking.

Humankind has been evolutionarily directed to live in a social environment, with a principal tendency toward complex social structures consisting of societies composed of a hierarchy of overlapping nested groups, each containing specific cultural and social norms under the umbrella of the general cultural and social norms of the encapsulating society. Not only pure survival, but basic psychological needs and the well-being and quality of life of the individual depend on the cognitive skills to effectively negotiate social interaction in meeting the demands of the individual's social environments.

The regulation of affect is pivotal to the formation and maintenance of social relationships. Affect not only informs and directs reasoning, but may also block it. This is reflected in the Kabbalah, which warns that even the pillars of morality embodied within the *Sefirot* become immoral and destructive once they become extremes, such that, loving kindness taken to mindless obsession can lead to both sexual depravity and lack of justice in failing to properly punish wrongdoing and thereby insufficiently protecting the innocent, and, when justice itself becomes overzealous, it can lead to unfair punishment and even to torture and the murder of innocents. With this understanding, 'emotional intelligence' – the maintenance of balance between emotion, rationality and morality – has now been recognized as an integral component of social integration in the fields of psychology and psychiatry (see, for example: Mayer, Salovey, & Caruso, 2004; Mayer, Roberts, & Barsade, 2008; Mayer & Salovey, 1997; Izard, Fine, Schultz, Mostow, Ackerman, & Youngstrom, 2001; Lopes, Brackett, Nezlek, Schütz, Sellin, & Salovey, 2004; Keefer, Parker, & Saklofske, 2009; Lopes, Grewal, Kadis, Gall, & Salovey, 2006; Lam & Kirby, 2002; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002; Emmerling, Shanwal, & Mandal, 2008; Di Fabio, 2015; Payne, 1986; Zeidner & Matthews, 2016; Schutte, Malouff, Bobik, Coston, Greeson, Jedlicka, Rhodes, & Wendorf, 2001; Sánchez-Álvarez, Extremera, & Fernández-Berrocal, 2015).

Although normatively conforming to the general rules and behavioral expectations of the larger umbrellas of civilization, culture, society, nation, state, city and community, social relations are actually experienced more directly, intensely, consistently and personally in small group settings, as outside of small groups person-to-person encounters are more random, fleeting and superficial, hence social rules and regulations are more directly defined and reinforced in interpersonal interactions within the group dynamic in small group settings. Since social relations are defined by groups, social integration is developed through the individual's interaction within each distinct group to which the individual belongs, particularly through the formulation of a shared understanding regarding common themes. It is the group dynamic in the participation of social/learning activities in small groups that forms the vehicle by which both social integration and learning is enhanced in CNE with its emphasis on perspective taking.

Perspective taking is an essential component of bonding and genuine, meaningful connection with another, consisting of the ability and custom to go beyond spontaneous, initial surface impressions and apply a thoughtful appraisal and a honed proficiency in recognizing and interpreting social cues that explain another person's thinking, feeling and behavior from that person's perception of her or his own situation in a particular social encounter.

Perspective taking involves the development of respect for, understanding of, and empathy with, other individuals by putting oneself in the other person's place and reflecting how one would feel and act in that place (*b'tzelem Elohim* applied on an individual basis). An important process of perspective taking is social context appraisal – the balanced assessment of social contexts and circumstances which account for an individual's behavior in a particular social encounter (the application of an aspect of both *derech eretz* that guides behavior in accordance with a particular society's rules and expectations and that of *chesed* in selfless concern for, and true empathy with another).

While the context of the individual is always essential for understanding individual behavior, in the CNE group dynamic social context appraisal transcends individual behavior, extending to the culturally transmitted 'norms' of the group (an application of an aspect of *amcha* in conjunction with *derech eretz* in one's identification with the group and its shared values, concerns and rules of conduct). In the CNE group dynamic, perspective taking integrates both the personal context and the social context defined by the group 'norms.'

An essential element of perspective taking is affective engagement. It is precisely one's own emotional state that influences one's perception of another's emotional state and determines the selection and processing of individually relevant social information that determines the degree to which one effectively picks out the essentials of a situation relevant to the individual or individuals concerned and the implications thereof within the particular social encounter. However, it is impossible to understand the affective state of another unless one's own affective response is appropriately well harmonized with one's own personal situation relative to the context of any particular experience. In order to correctly understand another's feelings, one has to consistently experience one's own *appropriate* emotional reactions. A major part of perspective taking then, is the realization of one's own emotional capacity by learning to engage experiences deeply through commitment and the full giving of oneself to the experience with introspection, reflection, sharing and attachment. By putting oneself totally into the experience as an integral part of the experience, the individual learns involvement and concern; and learns to fully relate to the experience and to others – to feel, to empathize, and to bond.

Though functioning as a powerful modality for the prevention of and recovery from cognitive and behavioral disorder, effective in even profound cognitive dysfunction, CNE is presented as a fun, engaging program of activities conducted through a group dynamic emphasizing shared engagement through teamwork, problem solving challenges, discussion, dialog, debate, critical thinking, and personal reflection. CNE participants experience the program as a recreational, social and educational curriculum promoting health and well-being for mind and body through exercise, social relations, and learning activities. There are no references of any kind to the stigma and negative connotations of therapy, pathology, disability, mental abnormality or diagnostic labels.

As new thought patterns and cognitive constructs emerge from engaged, affirmative, self-fulfilling learning experiences within the enriched environment, both the depth and breadth of the individual's cognitive core is exercised, strengthened and continually expanded through the introduction of new ideas, ways of thinking, frameworks of knowledge and understanding that open up ever-multiplying doors of possibilities. The richness of experience of bonding with and developing respect for and appreciation of others, the joy of belonging and acceptance in group identity, and sharing of discoveries and feelings opens up the individual's self-conceptualization and the possibilities of being.

Through the CNE program the participants internalize *chesed* and assimilate the harmony of the *Sefirot* in righteous actions (achieving emotional and behavioral balance and well-being in involving themselves with, and caring about, others). As the Kabbalah states, if there were no righteous humans, the blessings (emanations of *Ayin*) would become completely hidden, and creation would cease to exist [as only humans evolved pseudo-fixed action patterns embedded with emotions and morality, all other organisms driven by fixed action patterns of behavior – i.e., automated responses neither moral nor otherwise – therefore, without humans, especially those that act in righteous ways, there can be no morality, and consequently no *Sefirot* and no finite world (creation); as, without receptacles (*Sefirot*), the emanations of *Ayin*, though radiating in the nebulous Infinite (the *Ohr Ein Sof*), would be hidden, unrealized through finite righteous actions, and without realization – the ultimate purpose of the emanations – and, thereby, without purpose, there would be no impulsion or transcendent impetus for the unfolding of *Ayin*, and hence, no creation].

Human actions are the 'Foundation' (*Yesod*) of the finite world of the earth [*Malchut* (kingship)] – referring to the dominion (responsibility of stewardship) of humankind over the earth, as the *Torah* [*Bere'shit* (Genesis) 1:26-28] relates: [26]"And [*HaShem*] said, 'Let us make man in our image, after our likeness. They shall *rule* the fish of the sea, the birds of the sky, the cattle, the whole earth, and all the creeping things that creep on earth.' [27]And [*Hashem*] created man in His image, in the image of [*HaShem*] He created him; male and female He created them. [28][*HaShem*] blessed them and [*HaShem*] said to them, 'Be fertile and increase, fill the earth and *master* it; and *rule* the fish of the sea, the birds of the sky, and all the living things that creep on earth'" (Jewish Publication Society, 1999/2000, p. 2 – substitutions in brackets and emphases mine). But this so-called 'dominion' of humankind is not meant to be a domination or ascendancy over the earth, but that of a loving caretaker, which, through *HaShem's* gift of the 'active intellect' [*Binah* (understanding), *Daat* (knowledge) and *Chochmah* (wisdom)] endows humankind with the capability and the responsibility to oversee and maintain the balance and harmony within the ecosytems of the habitats in which humankind resides. Such action must accompany the conscious intention of compassion, not only for all humankind but equally extending to all lifeforms and all *HaShem's* creations. Compassionate actions are often impossible without faith (*emunah*), meaning to trust that The Ultimate and Undefinable always supports compassionate actions even when the evidence for such seems hidden in the mundane and vacuous priorities of unenlightened society. Ultimately, it is necessary to show compassion toward oneself too in order to extend compassion toward others. This 'selfish' enjoyment of the blessings (the appreciation of the majesty, beauty, bounty and awe of nature, and the pleasures in camaraderie and in satisfying the appetites of one's own senses, good health and vigor) – but only in order to empower oneself to assist others [the *Sefirah* of *Netzach* (victory)] – is an important aspect of

'Restriction' (avoidance of excess), and is considered a kind of golden mean (a perfection of balance or homeostasis) in Kabbalah, corresponding to the *Sefirah* of *Tiferet* (beauty or adornment).

The CNE enriched environment in a scientific context

Putting this into a scientific context, we define the neurophysiological correlates of the processes at work in the CNE curriculum through the agency of neuroplasticity, fundamentally understood as constantly changing patterns of neuronal interconnectivity ('neuronal' referring to *neurons*, herein defined as nerve cells of the brain) through 1] the modulation of channels of neuronal connectivity by a) synaptogenesis (the generation of new synapses; a synapse = the connective medium between one neuron and another) and b) pruning (the elimination of superfluous or ineffective synapses); and through 2] synaptic strength modulation involving the mechanisms of long-term potentiation (LTP) and long-term depression (LTD). LTP is defined as the development of a long-lasting synaptic strength between a presynaptic-postsynaptic neuron pair as a product of the interactivity (reverberatory interaction) of the pair and LTD is defined as the long-term persistence of the depression of synaptic action (i.e., inhibition of connection) between a presynaptic-postsynaptic neuron pair.

The CNE enriched environment contains strong, affirmative, stimulating, deep, constantly expanding learning experiences that trigger persistent reverberatory interaction in neuronal connections, and through such continual associative action effecting a change of thought patterns, weakens – in the lack of excitatory (connective) synaptic action – both the reverberatory interaction of neuronal interconnections representing previous faulty learning from negative experiences and the attendant ineffectual or detrimental cognitive constructs, as excitatory action is dominated by the new, affirmative learning and newly configured thought patterns constantly deepened and broadened by the positive-directed learning.

The cognitive constructs formed from the new learning within the CNE enriched environment are continually strengthened by LTP and become dominant cognitive constructs undermining the relevance of the previously formed detrimental or negative cognitive constructs, whereby the presynaptic-postsynaptic connection between neuron pairs comprising the pattern of neuronal interconnections representing a negative cognitive construct are less activated as the negative cognitive construct more and more fades from ongoing thought patterns, the related less active synaptic connections continually weakening to a threshold point triggering LTD that, in turn, triggers the elimination of the synaptic connection between the neuron pairs comprising the pattern of neuronal interconnections representing the negative cognitive construct, purging it from the behavioral repertoire of the individual's cognitive schema ('cognitive schema' refers to the continuously interacting 'combinations' and 'permutations' of the individual components of the full complement of one's cognitive constructs and the behavior induced therefrom).

These neurophysiological processes stimulated through CNE promote growth of mind and spirit, casting off negative traits in the revamping of deficient, dysfunctional or dormant cognitive constructs whereby the individual reaches higher planes of cognitive proficiency (animating the

'active intellect') and absorbs the harmony and ethical qualities of the *Sefirot* in communion with the emanations of *Ayin* on the road of righteousness (*tzedakah*), becoming whole (*sh'lemut*), reengaging with oneself, with others and with life itself in awakening to a new and meaningful life [*Hod* (splendor)].

While using Judaism as an example of the deep connection between spirituality, evolutionarily determined human values, mental health, religious quest and the enterprise of science, it should be borne in mind that spirituality is a universal condition of humankind, and most religions share basic principles of spirituality. Despite the surface differences in custom, ritual, liturgical texts, and forms of observance, in digging beneath the surface one can find that the fundamental spiritual quest is markedly consistent across a wide span of religious traditions, sharing the same basic affinities between faith, human values and science as demonstrated in this study.

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