

# Mandala Patterns in Nature – Incentives for Artistic Expression and Possible Development of the Intuitive Nature of Awareness in a Preschool Child

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## Abstract

*Vitaly creative forces in nature enable growth, leaving reflections – matrices in their material manifestations. In nature, one of the most remarkable is the central composition of the (natural) mandala. The article refers to the known attributes of the mandala - for the purposes of treatment, potentially establishing balance between the four functions of consciousness: intuition, feeling, sensation and thinking. It leads the human to wholeness and a harmonious and balanced relationship with the self. The results of the research conducted with preschool children, who used mandala compositions as incentives, are presented. The paper shows that a creative gene of the very nature's character, through the matrix of the mandala, can be associated with the possibility to successfully motivate children's attention and encourage them to perform art work upon observation, owing to the psyche's structure being innately developed in humans since birth, and which children intuitively experience.*

**Key words:** artistic expression; consciousness; intuition; mandala; preschool age.

## Introduction

The word mandala is of Sanskrit origin, meaning a circle. It represents the integrity, microcosm and macrocosm, whose manifestation is in nature in the examples of living organisms to the celestial phenomena. The circle, according to Rudolf Arnheim, is the simplest primordial form commonly found in children's drawings due to its central

symmetry in all directions. Rhoda Kellogg divided the development of children's visual art into four stages within the preschool period. Each stage is upgraded to the previous one and a child goes through all phases. After initial scribbling in the creation of basic forms, the child in the third stage of development begins to overlap the shapes. In this way, the child does the first mandala forms, such as a circle and a square divided by a cross into quarters. At the stage of creation of the basic forms, the child is driven by the instinct of psychological growth, which, at that age, aims to develop awareness of his/her own identity (moving from the "self" to "I", i.e. from the third person to the first). The child graphically efficiently and logically uses the circle to represent the phenomenon as a multiplicity of identities of self-contained elements. In some respects, he/she receives inspiration from various circular objects observed in his/her surroundings, and the form of the mandala in nature was also a great incentive for children's artistic expression. In the fourth stage, a child creates a human figure from mandala shape.

By studying dreams within psychotherapy, Carl G. Jung reveals the emergence of mandala in the dreams of a man resulting in a process of researching the meaning of life. Jung's research was also used by therapists who discover the patient's condition in his/her artwork. In nature, we find mandala as a structure that can be represented by elements from sacred geometry that speaks of the universality of natural relations as cosmic constants. In scientific research, samples were obtained representing mandala forms, such as frozen crystal structure of water, the Chladni figures, examples of steel plates that form mandala shapes when sanded under the influence of sound waves. The knowledge and almost mystical influence of sacred geometry have been transmitted for centuries through painting and architecture. Likewise, a frequently encountered term labyrinth, with the basic structure of a spiral leading the man to his inner centre, denotes the mandala.

## **Spiritual and Ritual Symbol**

The circle symbolises natural completeness, while the quadratic form represents an understanding of this in consciousness, quotes Jung (1973). According to Plato, the ball is a symbol of the psyche, and the square a symbol of matter. Marie-Louise von Franz, a Swiss psychologist of the twentieth century, "explains the circle or the ball as a symbol of the self", and the circle expresses the whole of the psyche in all its aspects, including the relationship between man and nature (Jung, Franz, Henderson, Jacobi, & Jaffé, 1973, p. 240). The Self signifies the totality of what makes Me, the totality of what makes personality and individuality. The alchemists were searching for the spirit of body and soul, and they produced a lot of names and symbols, and one of the fundamental symbols was the square footage of the circle, which is a mandala, emphasises Jung (1973). "Whether the circle symbol appears within the primitive sun-worship, whether in modern religion, in myths or dreams, in the mandala drawn up by Tibetan monks, city planning, or spherical concepts of ancient astronomers,

it always shows only one, the most important aspect of life - its ultimate wholeness” (Jung et al., 1973, p. 240).

The earliest preserved mandala originates from the 6<sup>th</sup> century AD, currently in the Metropolitan Museum in New York, and is a holy seal with the central figure of Shakyamuni, the founder of Buddhism who lived in the 6<sup>th</sup> century BC, surrounded by eight saints. “He made a mandala dedicated to the lord of time, Kalachakra, one year after reaching Awakening” (Barou, 2011, p. 102). Kalachakra mandala or the wheel of time is made of powder of various colours, as a momentary work that is sprinkled on the body of a practitioner or in a river. The Kalachakra Tantra is a collection of philosophical texts divided into five parts describing the physical world, the human body, Kalachakra’s initiation, meditation practice, and the state of enlightenment of bliss and void in unity. The second part of the collection of the inner Kalachakra speaks of the human body, its channels and centres, and the body is represented as a five-pointed mandala symbolically depicted by the corpse and four limbs. Martin Brauen (1948- ), a Swiss anthropologist, points out that, according to the tantric concept, the breath passes through the channels in the body and each has its own direction, element, aggregate and colour, thus forming a mandala.

The image repeated by all today’s mandalas is Buddha in the centre and eight petals around him, each one carrying a deity. According to Lama Anagarika Govinda (1898-1985), Buddhist interpreter, the symbols are not just arbitrary expressions but “spontaneous expressive forms that emerged from the deepest areas of the human spirit”, which are exactly the archetypes to which Jung attached importance (Barou, 2011, p. 103). In Tibetan Buddhism, richly decorated mandalas represent a cosmos in its relation to divine powers, according to Jung (1973). Some communities use the mandala motif to reestablish the lost inner balance, like Native Navajo Indians, who create mandala forms in sand to try to restore a sick man to be in harmony with himself and the cosmos. These pictures are sprouted on a diseased or on the ground. In the East, similar images are used for stabilising the inner being or for deep reflection. By using natural pigments and bird’s feathers, Australian Aborigines create a short-term installation on the ground of the desert shown as twisting of concentric circles, believing that they ensure the survival of animal species and plants. Oriental mandalas are drawn, painted, and shaped of living human bodies at special ceremonies. Mandalas are significant in ceremonies as they have a figure of great religious value in the centre. In all Eastern mandalas, there prevails a certain and clear style and traditional structure. “By studying the Tibetan mandala, Giuseppe Tucci says that the circle is really a ‘psycho-diagram’” (Barou, 2011, p. 101). Every colour refers to certain elements of personality: white to ignorance, yellow to pride, red to lust, green to jealousy and dark blue to anger. Barou (2011) states that colours are orientation, signalisation with the purpose of establishing a new foundation of personality. Through the mandala, a Tibetan intern exposes himself from the body, disappears from the appearing world and becomes an “empty form” – he is born

of himself, he is Buddha, points out Barou (2011). One Tibetan man told Jung that mandalas were spiritual, inward images that can only make a competent lama with the power of imagination. No mandala is the same, and those seen in monasteries and temples have no particular significance since they are only exterior representations, states Jung (1984). Consequently, the mandala has two aspects: the reestablishment of the order that existed earlier and the expression of something that does not yet exist. Mandala can be found in almost all cultures, according to Zhou (2015): African Bwa sun mask, Scythian Kelermes and Chinese bronze mirror, Chinese I-Ching, Chinese, Egyptian and Byzantine horoscope, hundred Chinese characters for longevity, Jewish Merkaba, Jewish wheel Sefer Yetzirah (Book of the Genesis), the ceilings of the Islamic mosques, the rosettes of the Mogul's Emperor, the Aztec, the Greek and the Egyptian Ouroboros, the Aztec and the Mayan calendar, the Celtic bronze disc, the Chartres cathedral labyrinth, the Christian celestial maps and the Greek Phaistos disc. Tribe Naskapi calls its soul "Mista peo", that is, the Great Man, an archetypal symbol for the self, represented as a circle divided into four parts.

Jung (1875-1961), a Swiss psychiatrist and psychotherapist, discovered the mandala symbol in dreams with a man who begins to have his own sense and order in life, or mandalas appear as expressions of divine experiences in the waking state. "Symbols of dreams in the process of individuation are images of archetypal nature that appear in a dream, and depict the process of centring, i.e. creation of a new personality core" (Jung, 1984, p. 49). Motives of dreams constantly return at intervals to certain forms which by their features make up the centre. The symbolism of the mandala includes all concentric-aligned figures, a circular path around a centre, round or square, and all circular or ball-shaped rows. Psychological images of the whole have mathematical structure: "they are usually quadruplets or their multiples" (Jung & Pauli, 1989, p. 46) Jung's patient with four hundred dreams showed a special preference for pictures in the form of mandalas: a snake describing a circle, a globe, a symmetrical garden with a fountain in the middle, a complicated ritual in a square area, a wheel with eight spokes, a circle with a green tree in the centre, a round bouquet of roses and so on. "In all these mandalas, the soul of the dreamer itself is depicted in its entirety and in its present truth. Sometimes, they point to the goal of development, centre, self, and sometimes opposition, the struggle of Me with shadow, or polarity, animus and anima" (Masquelier, 2011, p. 112). These images are already mentioned archetypes, great findspots of meaning that form collective unconsciousness of every individual. "The ultimate goal of researching man's own unconsciousness is to create a harmonious and balanced relationship with the self" (Jung et al., 1973, p. 213). It is the mandala that shows this perfect balance.

## **Meanings of Mandala**

Jung states that the condition of each individual is the result of a balance between the four functions of consciousness: intuition, feeling, sensation and opinion. The result of this equilibrium is consistency or integrity, an ideal that every man strives

for. In most people one function prevails, one is almost none at all, and the other two functions are somewhere in between, says Krystal (1998). When this function is dominant, a person uses it most because it gives one a sense of security in everything one does. In her work (1998), Phyllis Krystal describes an exercise called mandala that uses the visualization of these four functions in the form of a cross within the circle to establish balance. Each function has its own colour, the function being more or less developed, depending on the colour's strength.

From the beginning of 2000, empirical research on the effect of treatment was carried out using mandala. Unfortunately, research works are scarce, and not all of them are done under the best conditions, but some results have been achieved, and more importantly, there are instructions given for further research. A research study was conducted with participants who are characterised by post-traumatic stress disorder. The participants, 36 students, were divided into two groups, a mandala group and a control group. The mandala group received papers, pens and pastels, and the task of drawing a big circle that will be filled with pictures of emotions or feelings associated with their trauma using symbols and patterns without words. The control group was given the task of drafting a specific object (glass, bottle and pen), with as many details as possible, in three days. After one month, all participants completed the final questionnaire, and the mandala group had to further describe the symbolic meaning of their drawings. The results showed that the mandala group had fewer traumatic symptoms than the control group. "The mandala drawing provides cognitive integration and organization according to complex emotional experiences that will give meaning of the personal meaning, but it also serves as a mechanism of revelation through therapy, as does a written statement" (Henderson, Rosen, & Mascaro, 2007, p. 149). An objection to the research is a small sample of people from the same circle, different number of female and male participants, and a lack of comparison with other possible control groups such as other fine art therapy, a mandala to be coloured and the form of written therapy.

Another study investigated various types of fine art therapy to reduce anxiety. The participants, 84 students, were divided into three groups, where the first group painted an already structured mandala, the other group painted the plaid pattern, and the third received an empty sheet of paper and could arbitrarily draw what they wanted. The results showed that anxiety decreased roughly the same in the first two groups and that the two groups experienced a greater anxiety reduction than the third group receiving a blank sheet of paper. "Structured colouring of a reasonably complex geometric pattern can induce a meditative state that helps people suffering from anxiety" (Curry & Kasser, 2005, p. 81). This study is criticised for a non-representative sample of subjects.

The third study investigated whether creation of mandala had an effective impact on physiological stress reduction in people with mental retardation. Fifteen participants were divided into three groups, the first group drew mandalas, the second group drew

by their choice, and the third group did not get any assignment. The results showed that there were no significant differences in the groups as to the level of reduced stress, but in the mandala-drawing group there was a change in blood pressure, in a statistically significant reduction in both systolic and diastolic blood pressure between the first and the last response. “Drawing mandalas contributes to effective stress reduction in people with mental retardation, but there is no evidence that this is a more effective method than those from other control groups” (Schrade, Tronsky, & Kaiser, 2011, p. 109).

Under the influence of Jung’s psychology, visual therapist Joan Kellogg used the mandala drawing method in patient therapy. Kellogg considered that mandala drawing can give information on the current relationship between the ego and the self in the patient. Kellogg has developed archetypal levels of a large mandala circle that consists of twelve schemes of mandala structures reflecting the “spiral path of psychological development” (Fincher, 2009, p. 26). Each level has a set of typical patterns that can be found within the mandala. Figure 1 shows the cycle of psychological development, and the phase names are: emptiness, bliss, labyrinth, beginning, goal, dragon battle, squaring of a circle, functioning ego, crystallisation, death door, fragmentation and transcendental ecstasy.

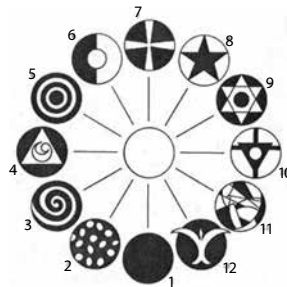


Figure 1. Archetypal levels of the big mandala circle (Fincher, 2009, p. 25)

Along with these levels, Kellogg offered a hypothesis about colour choice as a reflection of conscious and unconscious content within the mandala. Based on these studies, Kellogg has developed a MARI (Mandala Assessment Research Instrument), an instrument for exploring the mandala evaluation by an individual, used by many fine art therapists today. MARI is a comprehensive system based on Jung’s concepts that uses the form of mandala to reveal the inner reality of an individual, not just what his/her ego is depicting. Although this treatment differs from Jung’s treatment, because in this case the subject selects the symbols and colours that reflect it without the guidance of an analyst, who allows the respondent to make his own mandala on which the condition of the subject can be evaluated.

## Sacred Geometry

Sacred geometry is a natural science that has the foundation in the circle and its centre. The sacred geometry contains elements that describe many phenomena such

as plant growth, human body proportions, planetary trajectories, crystal structures, and music.

The two sizes are in the golden ratio if the smaller part relates to the larger one as the larger one relates to the total. Golden ratio or divine proportion is present in all aspects of human life and it connects mathematics, nature, technics and art, and is often perceived as representing the beauty and harmony of the object. The golden ratio is a mathematical constant which is indicated by the Greek letter  $\Phi$  (fi) and is 1.6180339887 ... Leonardo Fibonacci, a 12<sup>th</sup> century Italian mathematician, studied rabbit propagation and noted a sum of new-born rabbits: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, .... That string is called Fibonacci's string. The ratio of two consecutive members is equal to the golden ratio.

The rectangle where the ratio of a longer side to a shorter side equals  $\Phi$  is called the gold rectangle. Examples of gold rectangles in construction are very common: Greek buildings and sculptures, Giza pyramid, Chinese wall, Hagia Sophia, Taj Mahal, Notre Dame Cathedral, St. Mark's Church in Venice, St. Lawrence's Cathedral in Trogir and many other buildings. "Many Renaissance artists used golden ratio on their paintings and sculptures to achieve balance and beauty" (Zlatić, 2013, p. 85).

Charles Bonnet, an 18<sup>th</sup> century Swiss philosopher, studied the plant phyllotaxy (the way of growth) where he observed the regular occurrence of two adjacent Fibonacci numbers. The gold or logarithmic spiral is based on the golden ratio because in its construction we obtain squares whose surfaces are Fibonacci numbers. There are many spiral shapes in the nature: the structure of cones, sunflower seeds make up the spiral in two directions, the growth of broccoli, pineapple and various cacti and flowers, rose petals from the middle to the outer part grow in the form of a spiral, and the number of petals of most flowers is the Fibonacci number. In plant growth a number  $\Phi$  is displayed; rotating by the golden angle of 137.5° when forming new branches, leaves and flowers, plant ensures an optimal arrangement, says Zlatić (2013). The apple cut in half shows pentagram-shaped seeds with  $\Phi$ -fractions. Bees build hives proportional to sacred geometry, and if we divide the number of females with the number of male bees in a hive, we will get the number  $\Phi$ . "The body structure of many animals is in proportion of the golden ratio, e.g. butterflies, snails, dolphins, birds, penguins, ants and many other animals" (Zlatić, 2013, p. 86). The spiral can be seen in the human ear, fingerprint and even DNA structure, and the perfect human body is in proportion of the golden ratio. Water whirl, storm and galaxy like the Milky Way, form a spiral, and, for example, the planet Saturn and the Earth's distance from the Moon give the proportion of the golden ratio.

## **Artistry of Mandala**

Jung's understanding of the human equilibrium of the functions of consciousness: intuition, feelings, sensations and opinions, according to Peat (2000), can also be looked for in art. Jung (1973) states that in art, circle is often depicted with eight beams,



which expresses mutual interruption of these four functions of consciousness, so that four non-adjacent functions are found together, such as thought coloured with a feeling or intuition. “In fine arts of India and the Far East a four or eight-circle circuit is a common form of religious images that serve as a stimulus for reflection” (Jung et al., 1973, p. 240). The completeness symbolised by the mandala is often associated with beings from myths and legends.

“Marcus Vitruvius Polio wrote about the symmetry of temples, and compared their proportions with the proportions of the human body” (Zlatić, 2013, p. 85). Vitruvius drew a human body in the circle, later reinterpreted by Leonardo da Vinci. Giordano Bruno, an Italian Renaissance philosopher, created mandala patterns to stimulate the training of those who study mandalas. Jakob Böhme, a German philosopher of the 17<sup>th</sup> century, used mandalas to express his own conviction that God was the unity of darkness and light. When artists in the Renaissance began to return to the body and soil, an Italian artist and architect Francesco di Giorgio drew a plan for a circular church or a basilica based on the human body proportions (Figure 2).

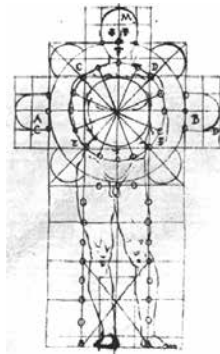


Figure 2. Francesco di Giorgio, human body inscribed in the plan of a church, 15<sup>th</sup> century

Aureole is also a mandala, where Christ’s aura is divided into four parts, “which is an important allusion to his suffering as the suffering of the Son of Man, and to his death on the cross, and at the same time the symbol of his differentiated integrity” (Jung et al., 1973, p. 241). The fundamental symbol of Christian art is the cross. “Until the time of Carolingians, a common form was an equilateral or the Greek cross, and therefore the mandala was indirectly implied” (Jung et al., 1973, p. 243).

In Zen, a simple circle represents the character of Buddha, the essence of reality and other unchanging phenomena. Referring to the picture “Circle” by the Zen priest Gibon Sengai (Figure 3), a Zen teacher says that the circle represents enlightenment and symbolises human perfection. In modern art, the relationship between the two basic forms, a circle and a square, does not exist or is very weak and accidental, and this marks the symbolic expression of a man’s mental state: “his soul has lost roots and threatens to break up” (Jung et al., 1973, p. 249). However, “India and Tibet take Kandinsky, Mondrian, Malevich and Klee into abstraction” (Barou, 2011, p. 98). Wassily



Kandinsky says that the circle is a synthesis of the greatest contradictions; Figure 4 is an example of his work.

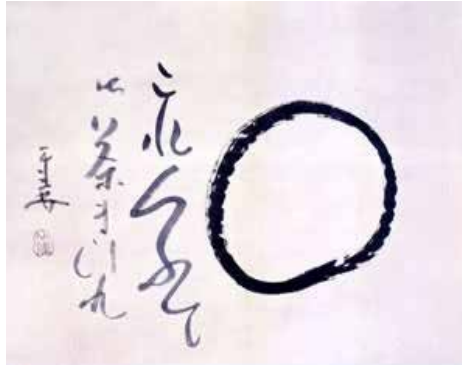


Figure 3. Gibon Sengai, Circle, 19<sup>th</sup> century



Figure 4. Vasilij Kandinsky, Circles in a Circle, 1923

## Mandalas in Architecture

René Daumal (1908-1944) wrote “Mount Analogue”, about a group of friends ascending the mountain, “linked by the common thirst for absolute, mythical journey to the Spirit” (Crossman, 2011, p. 108). The Analogue Mountain is a version of the Meru Mountain, the holy mountain, the cosmos centre in Hindu and Buddhist mythology. The hikers have a goal that is consistent with the quest for the Tibetan mandala devotees: “The quest for the highest bliss that awaits the one who reaches the last level of the palace contained in the circle, the highest point” (Crossman, 2011, p. 108).

As the centre of the cosmos is Meru Mountain, the Tibetan temple complex has a large hall in the centre where the Buddha statue is located. Following the mandala plan, the so-called *stupa*, a semi-circular construction with a base of concentric squares and a vertical structure in the centre that rises, is most often placed at the entrance to the temple for its protection. In addition to *stupas* there are stone sights, the so-

called *Mani dui*, piles of white round or square stones pointing to important turning points on the way to the temple. “The landscape around the temple defines a large-scale mandala bordered by mountains and water” (Xu, 2006, p. 73) Going around the sights, *stupas* or temples progresses to the centre, as if one walks through the mandala.

Mandala is present in the basic designs of secular and ecclesiastical buildings, but also in classical, medieval and modern city planning. An example of a city planning is Plutarch’s description of Rome’s founding. Romulus founded a city of circular shape around a circular pit called *mundus*, meaning the cosmos. According to one theory, the city was actually divided into four parts with a centre in the pit. It is precisely because of this mandala plan that the city rose with its inhabitants above pure secular frames, states Jung (1973). Many medieval cities were based on the mandala plan, surrounded by a circular wall, and the two main roads shared the quarters and led to four doors, while the church or cathedral was at the centre. This is not about aesthetics or economics, but such a plan meant transforming the city into a cosmic space, linking this sacred place to another world through its centre, as pointed out by Jung (1973). Every building or a city containing a mandala plan is in fact the projection of archetypal image of human unconsciousness into the outside world. “The city, the fortress, and the temple have become symbols of the psychic totality, and thus have a special effect on the people who enter or live in them” (Jung et al., 1973, p. 243). Examples of mandala plans are presented in the following pictures: religious centre (Figure 5), cathedral (Figure 6) and cities (Figures 7 and 8).



Figure 8. City of Palmanova, Italy

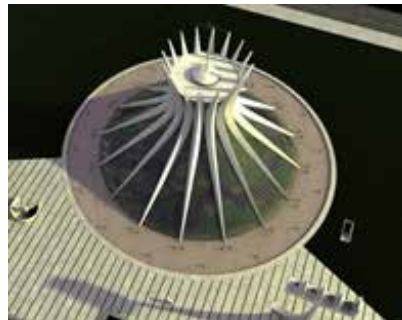


Figure 5. Temple complex Angkor Wat, Cambodia



Figure 6. Metropolitan cathedral, Brasilia



Figure 7. Place de l'Étoile (Fr. Star Square), Paris

## Labyrinth and Spirals

“The labyrinth in all cultures means the intricate and confusing picture of the world of matriarchal consciousness and it’s only those who are prepared for the particular introduction into the mysterious world of the collective unconscious that can pass through it” (Jung et al., 1973, p. 125). The labyrinth symbolically marks the search for the right path in life.

Labyrinth is a word derived from the language of the people of Crete. The Greeks accepted the expression *labris* that referred to the double axe, a common symbol on Crete that actually represents the butterfly wings and points to evolutionary transformation, which is quite consistent with the symbolism of the labyrinth. The Greek suffix *ithos* points to where the labyrinth is located. It is most likely that the term labyrinth originates from the Greek myth about the Minotaur which King Minos of Crete has imprisoned in a jail in the form of a labyrinth. People from the earliest times carved signs of a similar labyrinth on the cave walls or objects. In numerous European churches and monasteries we can find labyrinths as floor mosaics. Yet even today, it is not known whether the Cretan labyrinth was ever really built and whether the Legend of Minotaur is just a legend.

The labyrinth is an early form of sacred geometry, and the centre of the labyrinth is often referred to as a rosette consisting of six rose-shaped petals. Rose is a symbol of the Virgin Mary, according to Breese, which is associated with the Holy Grail and the lotus flower in the East, and roses and lotus appear in sacred art.

To make a labyrinth a labyrinth, the following elements must be met: one must have one entry, a path that winds or turns repeatedly, there must be no crossroads or blind streets, there is one centre, one path leads to the exit, and the exit is actually the entrance. In his work, Kezele lists nine types of labyrinths, and here we will mention two, a labyrinth of power and a labyrinth of feelings. The labyrinth of power, with its astrological name of the Sun’s labyrinth, is the most famous form of labyrinth. The labyrinth of power represents an inner way to the human centre, self or soul. The labyrinth consists of seven trails, and each path denotes a chakra or energy centre in the human body. “It is in this form that it is preserved on coins from Crete and found carved in stone in Central America or made of stone in northern Europe” (Kezele, 2007, p. 85). The labyrinth of feelings or the Moon labyrinth is the oldest labyrinth as it contains one of the oldest symbols of mankind, a spiral that reflects the act of movement. The circle-shaped labyrinth resembles a spiral, which is considered a map of the underworld, and which should point the souls of the deceased to the right path, according to Borovac (2004). “Spiral indicates what is emerging; it refers to the eternal return and to the recurring character of evolution. The double spiral, with its inward and outward motion, means return and regeneration, life and death” (Borovac, 2004, p. 142). The spiral that moves inward indicates the direction of energy, accumulation of power, arrival to the centre and preparation for creation, whereas moving out signifies

the manifested energy, the process of creation, and unification of the inner and the outer, according to Kezele (2007).

Labyrinths are the most powerful forms that exist and they create, radiate and give power, says Kezele (2007). Labyrinths serve to increase energy, intelligence and wisdom. “The labyrinths can be used like yantras, in the form of wall paintings or engraved labyrinth contoured tiles” (Kezele, 2007, p. 58). Yantra, one of the mandala forms, is a combination of geometric elements and serves as a means of contemplation. Yantras are objects whose presence creates balance in the entire system of a holder. Labyrinth trails lead to a hidden inner centre. “We can speak of the layers of consciousness through which we symbolically pass the paths in the labyrinth” (Kezele, 2007, p. 67). Walking toward the centre symbolises the movement inward to receive something, and walking toward the exit signifies the transmission of what we have received into the physical world, according to Breese.

## Presence of Mandala

Ernst Chladni (1756-1827), a German physicist and musician, investigated the plate vibration, scattering sand on the flat plate and directing sound waves toward it, which caused resonances where the plate segments vibrated in different directions. Node lines are places that are not subject to flickering, and by varying the frequency and amplitude of stimulation, various sand patterns, Chladni figures (Figure 9), are obtained.



Figure 9. The example of one of Chladni figures

“Sound waves emitted by the steel plate that vibrates, and made visible in a photo, form a pattern that strikingly resembles mandala” (Jung et al., 1973, p. 304). Chladni’s research was resumed by Hans Jenny (1904-1972), a Swiss physician, who invented tonoscope, an instrument that allowed him to observe the nodes in the vowel pronunciation. Jenny noticed that vowels of ancient languages, such as Hebrew or Sanskrit, are in the shape of Chladni figures, which are very similar to the form of written symbols in those languages, which cannot be said for contemporary languages. Masaru Emoto (1943-2014), a Japanese researcher, analysed the structure of frozen water and established the connection between mandala form and “healthy” samples in nature. Emoto discovered that frozen, pure water always has a crystalline mandala structure, while water that is polluted or does not have such a structure is fragmented,

partially crystalline structure. Emoto noted that every thought and feeling of human beings contributes to the crystal breakdown of the mandala structure or the re-establishment of the mandala form. Positive, generous and kind thoughts support the development of crystal mandala structures, while negative thoughts break this pattern. The fracture of crystal structures is also affected by electromagnetic products such as mobile phones, microwave ovens, televisions and computers. Fractal geometry, branch of mathematics, shows that iteration, that is, consecutive repetition of some computational or geometric process, results in a fractal image. The key element of a fractal is self-similarity, which means that the fractal can be divided into small parts, each of which is a reduced copy of a larger whole.

### **Philosophical Aspect by K. E. Wilber**

Kenneth Earl Wilber (1949-), an American philosopher, after exploring various types of developmental and evolutionary theories, conceived a square model of consciousness and graphically depicted the development of consciousness. The combination of four quadrants represents an integral theory of consciousness that integrates thirteen of the most influential schools of consciousness: cognitive science, introspectionism, neuropsychology, individual psychotherapy, social psychology, clinical psychiatry, developmental psychology, psychosomatic medicine, unusual state of consciousness, eastern contemplative tradition, quantum approach, research of subtle energies and evolutionary psychology. Wilber (1997) points out that all of these approaches are correct; no theory of consciousness can be complete by ignoring data from other dimensions of consciousness. Four quadrants signify intentional, behavioural, cultural and social existence, and each quadrant develops through twelve levels. Wilber sums up four quadrants down to three: individual subjective signifies the self, the collective, cultural signifies the worldview, and the objective manifested reality signifies empirical science as cited by Veršić (2008). Wilber (1997) emphasises that each quadrant causes others and is simultaneously conditioned by others in a circular and unstructured manner. Consciousness is equally present in all four quadrants; therefore the integral theory of consciousness represents mandala.

Clare Graves has developed a two-spiral model of human development in which man moves from one equilibrium state to another. "As the spiral develops, each round is moving from one reality to another without interruption" (Sobol, 2002, p. 11). A newer version of this model, proposed by Beck and Cowan, is spiral dynamics consisting of memes, "conceptual/information packages that are transmitted from mind to mind, from community to community" (Sobol, 2002, p. 11). Sobol (2002) states that this approach includes the concept of human development that reflects and extends the Wilber model.

### **Development of Children's Artistic Expression**

Rhoda Kellogg explored forms and patterns of children's drawings over a period of twenty years. Kellogg believes that there is a universal pattern of children's artistic

expression, regardless of children's different cultural backgrounds. Her research focuses on the characteristics of forming the line in the process of scribbling and drawing, so the development of artistic expression has been divided into four phases: the phase of a pattern, the shape phase, the design phase and the phase of an object. The development of visual expression begins when the child begins to scribble on paper for the first time, Kellogg (1970) states that it is around the second year of life, and the last stage of expression starts at the age of about five when a child begins to create a scheme to which the environment is inclined. Children go through all phases at different times, some sooner or later, but none of the phases is skipped, according to Kellogg (1967).

The first stage of a sample is a self-teaching phase that begins in the second year of life and consists of the classification of basic stripes and the position of samples. Kellogg's view (1970) is that visual interest in the process of scribbling is an essential component for acquiring the ability to later draw lines. Scribbling is not only a child's motor pleasure but also a valuable experience that develops the child's cognitive capacity, claims Kellogg (1967). Rhoda Kellogg defined twenty types of signs (points, lines, tangled lines, spirals, circles, and various combinations), where each sign indicates the movement of various variations of muscular tension that does not require visual instructions. When children's signs are progressing according to the classification of pattern positions, then the signs are in the marked space or frame requiring eye control to distribute the signs relative to the edge of the paper. At this stage, a circle, a rectangle, a triangle, a square, an arch, and various unusual shapes appear as underlying figures.

The second phase is the shape phase; also a self-teaching stage between the second and the third year, which consists of classification of diagrams and shapes, states Kellogg (1970). The diagram is a group of six basic forms: rectangle or square, circle or ellipse, triangle, diagonal cross, upright or Greek cross and various irregular shapes. The same author states that a child is making signs that contain single lines to form a cross and outline circles, rectangles and other forms, and this is considered a developmental phase, as it ensures the transition between the sample phase and the classification of a diagram. Diagrams show the child's increasing ability to draw controlled lines and apply their own memory. Compared to basic stripes, pattern positions and developmental shapes where a child's sign is spontaneous and visually encouraging, diagrams are evidence of the child's first planning and reflection in drawing activities according to Kellogg (1970).

Rudolf Arnheim (1904-2007), a theoretician of art and film and a perceptual psychologist, considers a circle the simplest primordial shape that often occurs in children's drawings due to its central symmetry in all directions. The human limb lever structure supports a curved movement, manoeuvring the arm around the shoulder joint, and skilled rotation is provided from the elbow, wrists and fingers. Children use a circle in their drawings to show many things; however, that circle does



not represent roundness as a property of the subject but the integrity of the subject. Motor coordination and eye control at early childhood are not developed enough to shape a regular circle, but from a child's point of view it is not necessary either. "It is proven that children receive inspiration for their earliest shapes from various circular objects observed in their surroundings" (Arnheim, 1974, p. 176). Freud considers that it originates from the mother's breasts; Jung mentions the mandala symbol, while other authors mention the sun and the moon. Arnheim's structural frame of a cube (Figure 10), which represents the placement of signs with the highest stability, is a mandala in itself, says Kellogg (1967).

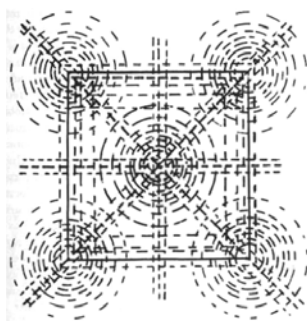


Figure 10. Structural frame of a cube (Arnheim, 1974, p. 13)

The third phase is the design phase at the age of three to four characterised by classifications of combinations, aggregates and balanced formations of lines that form mandalas, sun and radials, according to Kellogg (1970). The combination is a set of two shapes in the class diagram where the identified circle, square, rectangle and cross gradually become irregular and unrecognisable. Combinations are the result of overlapping the shape over one another. The aggregate is a unit of three or more shapes in the class diagram. Kellogg (1970) defines the aggregate as a large number of stripes immediately next to one another. There are infinite possibilities of aggregates and line features (thick, thin, uniform, tangled, long, short) that can be attributed to the range of child's attention during drawing. Mandalas, as defined by Kellogg (1970) in her classifications of children's works, are combinations shaped like a circle or square divided by a cross into quarters. This is a common combination that children really like. Examples of mandala in children's works are shown in Figure 11.

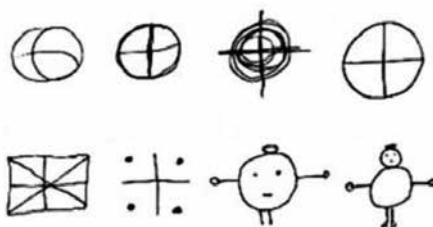


Figure 11. Mandalas in children's works (Gallagher, 2004, p. 108)



The author states that in her exploration of mandalas there is no greater mystical significance than other shapes, that all graphic symbols are mystical and mysterious. Kellogg (1970) points out that the symbol of a sun is characterised by straight lines that shape the signs moving from the centre or a circling circle, like the sun's rays, and although simple in its structure, the sun does not appear before the child begins to draw complex aggregates. Radial is a structure where the lines move radially from a point or from a small space into a shape that can affect the position of arms and legs in the drawing of a human figure that appears in the next stage of visual expression.

The last phase is a phase of an object that includes human figure and early illustrations such as animals, buildings, vegetation, traffic and other objects, beginning in the fourth year and continuing through early childhood, according to Kellogg (1970). The author emphasises that the way a child combines the stripes and diagrams determines a specific portrait of a human figure and all subsequent illustrations. When the first human figure is drawn, the child connects the face from the aggregate to the body parts from a modified mandala. Kellogg (1970) says that hand, foot and hair details show that aesthetics overcomes realism, each of which has its own story. The transformation of a human figure into a horizontal animal figure becomes useful for a child between the fourth and the fifth year (Kellogg, 1970). Buildings are drawn as a combination of diagrams in a variety of ways, not as a result of observing buildings in the street. The vegetation drawings contain trees and flowers that are basically present in earlier classifications from the earlier stages. Kellogg (1970) points out that these objects are not drawn in their natural sizes, but in the size necessary to satisfy the pattern or aesthetic goals.

## **Project, Conditions and Motifs**

The project was conducted in Medveščak Children's Nursery, in Zagreb, in two kindergarten groups, the mixed age Sun group and the medium age Bumblebees group. The motifs of the theme were: the leaves of spiral ferns, spiral endings of cucumber plants, spiral leaves of plants, flower of dandelion and dandelion with seeds, stem weeds, houseleek, cactus, flower of daisy, maypop and rose, snail shell, cabbage and kiwi, spider web, eye pupil, fingerprint, whirl, drops of rain in a pit, swirling clouds, spiral galaxies, and planets of Saturn and Jupiter. The motifs were presented in the photographs, and they offered various visual stimuli: sunflower in a pot, snail shells, dandelion with seeds, shells, comets, tree stumps and kiwi halves. In order to better notice the details, the children received magnifying glasses.

The following painting techniques were used for artistic expression: oil pastels, collage, gouache and temperas; and the material: paint palettes and bowls, water cups, tempera brushes, white drawing paper (block number 5), brown baking paper, black thick paper, scissors and glue. Papers were 30x30 cm square, except for baking paper which was 40x40 cm, but for the second day of the activities they were reduced to 30x30 cm. Collage or cardboard circles were used the first day, but for the second day of the project they were removed from the material.

Natural material was used to create a natural mandala (Figures 12 and 13): stump, grass, cones, cypress trees, branches, hortensia flowers, stones, tulip leaves, straw and white petals of various flowers.



*Figure 12. Bumblebees group making a mandala*



*Figure 13. Sun group made a mandala*

## **Conclusion**

Drawing, painting or building mandala shapes by observing, children do not absorb the mystical aspect of the mandala, they do not meditate... mastering circular-centric compositions they do not recreate either the symbols of a circle or a square, commonly used as universal symbols, but they focus on perception creating a composition that has a shape very close to the one spontaneously emerging from them as a possible universal pattern for all identities and phenomena. The awareness of the circular composition is evident in works that have been created after observing such forms. To solve this task, the child activated perception as a tool rather than as a reflexive statement of a phenomenon's identity by using squares or circles as a symbol of indication. Children transcend their initial autocentricity, not perceived to recognise the shape, but to establish the observed as a "selfish" fact, thereby confirming their own (separate) identity in relation to the observed or imagined.

In drawing, painting and building mandala forms, children found solutions for their compositions in completely authentic ways, avoiding the "innate" circle/square pattern as a solution and thus achieving divergent results. Natural mandala shapes prompted

in children careful perception of the specific compositional principle incorporated in shapes with a pronounced centre, instigating them to perform a work in which composition is superior to other visual arts. Even colour as a visual element was less interesting and so inconspicuously used in favour of the composition. At that early age, children felt the strength of the mandala composition as something stronger than all other art-compositional elements and principles, as seen in their works. The reasons for such a perception lie in the attractiveness of a centrally structured composition as a reference incentive for unconscious processes of focused states used by persons from the earliest age and the drawing phases of primary symbols - from two to three years old and up to the old age, to overcome developmental-growing processes. These processes affirm our way of life as a spiritual journey, that is, transform the banal life-journey, potentially depending on the material-technical conditions, into a sensational pursuit of more developed states of spirit.

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## Appendix

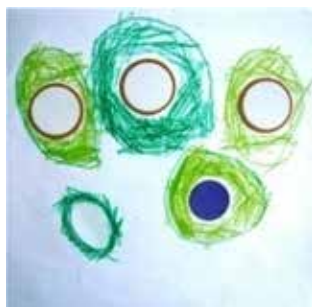
### Bumblebees group



1. A. S. (3 y. 8 m.)



2. E. M. (4 y. 7 m.)



3. G. Š. (4 y. 11 m.)



4. L. M. (5 y. 1 m.)



5. N. L. (5 y. 2 m.)



6. R. M. (5 y. 3 m.)



7-I. P.V. (5 y. 7 m.)



7-II. P.V. (5 y. 7 m.)





8.T.V. (5 y. 7 m.)



11.M.B. (5 y. 10 m.)



9-I.R.K. (5 y. 8 m.)



12.J.J. (5 y. 10 m.)



9-II.R.K. (5 y. 8 m.)



13-I.V.F. (5 y. 11 m.)



10.L.H. (5 y. 9 m.)



13-II.V.F. (5 y. 11 m.)



14. S. H. (5 y. 11 m.)



18-I. E. Š. (6 y. 1 m.)



15. M. M. (6 y.)



18-II. E. Š. (6 y. 1 m.)



16. L. K. (6 y.)



19. M. Č. (6 y. 1 m.)



17. I. K. (6 y.)



**Sun group**



1. L. G. (3y. 5 m.)



2. J. F. P. (3y. 7 m.)



3-I. K. Ć. (3y. 7 m.)



3-II.K.Ć. (3y. 7 m.)



3-III.K.Ć. (3y. 7 m.)



4. E. B. (3y. 8 m.)



5. E. D. (3y. 8 mj.)



6. M. B. (3y. 8 m.)



7-I. S. D. (3 y. 8 m.)



9. M. M. (4 y. 3 m.)



7-II. S. D. (3 y. 8 m.)



10. K. S. (4 y. 3 m.)



8-I. B. N. (4 y. 2 m.)



11. V. K. T. (4 y. 4 m.)



8-II. B. N. (4 y. 2 m.)



12-I. N. M. (4 y. 6 m.)



12-II. N. M. (4y. 6 m.)



14-I. E. V. (5y. 1 m.)



13-I. M. M. J. (4y. 10 m.)



14-II. E. V. (5y. 1 m.)



13-II. M. M. J. (4y. 10 m.)



14-III. E. V. (5g. 1 m.)



13-III. M. M. J. (4y. 10 m.)



15. M. P. (5y. 1 m.)



16-I. P.P.N. (5y. 3 m.)



16-II. P.P.N. (5y. 3 m.)

# Mandalni obrasci u prirodi kao poticaj za likovno izražavanje te mogući razvoj intuitivne naravi svijesti djeteta predškolske dobi

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## **Sažetak**

*Životno kreativne sile u prirodi omogućuju rast ostavljajući u svojim materijalnim manifestacijama odraze – matrice. U prirodi je jedna od najdojmljivijih središnja kompozicija (prirodne) mandale. U članku se govori o poznatim atributima mandale – za liječenje, potencijalno se uspostavlja ravnoteža između četiri funkcije svijesti: intuicije, osjećaja, senzacije i mišljenja, koje čovjeka dovode do cjelovitosti, skladnog i uravnoteženog odnosa s jastvom.*

*Prikazani su rezultati provedenog istraživanja s djecom vrtičke dobi u kojem se kao poticajima za likovno izražavanje koriste mandalne kompozicije. U radu je prikazano kako stvaralački gen same naravi prirode kroz matricu mandale može biti povezan s mogućnošću uspješnog motiviranja dječje pažnje i poticanja na izvođenje radova nakon promatranja, zahvaljujući strukturi psihe koja se u čovjeku razvija od rođenja i koju djeca intuitivno doživljavaju.*

**Ključne riječi:** *intuicija; likovno izražavanje; mandala; predškolska dob; svijest.*