ARCHETYPAL CREATIVITY AND HEALING:

AN EMPIRICAL STUDY OF FLORAL DESIGN (IKEBANA)

A Thesis

by

MILENA SOTIROVA-KOHLI

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

August 2009

Major Subject: Psychology

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Approved by:

Chair of Committee,	David H. Rosen
Committee Members,	Steven M. Smith
	James Lee Johnson
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ABSTRACT

Archetypal Creativity and Healing:

An Empirical Study of Floral Design (Ikebana). (August 2009)

Milena Sotirova-Kohli, M.A., Sofia University "St. Kliment Ohridski"

Chair of Advisory Committee: Dr. David H. Rosen

The theory of embodied cognition focuses on mechanisms of meaning beyond the traditional in western metaphysics dichotomy of body and mind. These mechanisms are considered to be the emerging aspects of meaning related to early infant experience of interaction with the environment. Image schema as the earliest form of representation in the mind corresponds to the notion of archetype from analytical psychology. Theory and research suggest that being in touch with the archetypal level of cognition is related to integration of parts of the personality and promotes well-being. Art and creativity are considered to facilitate this process and in this sense to promote healing. Active imagination is a method devised by C. G. Jung to relate to different aspects of the personality through creativity which results in a creative product. Active imagination bears similarity to art, however it focuses not only on the aesthetic outcome of the creative endeavor but also on the transformation of the personality in this process. Analytical psychology studies a number of creative expressions of the products of active imagination such as sand play, drawing, clay modeling, writing, dancing and psychodrama. However, there are no available empirical studies of the healing aspects

of creative work with cut flowers. We hypothesized that being involved in creative work with cut flowers would promote well –being expressed in increase of hope, existential/spiritual meaning and humility and decrease of depression, anxiety and physiological symptoms. The participants in our study were undergraduate students from Texas A&M University either involved in a semester long course in Floral Design or in an Introductory Psychology Course. Participants were assessed at two time points on all variables of interest. They were also asked to draw mandalas and to write essays (floral condition). Although quantitative analysis did not find any significant differences between the groups over time as a result of the creative work with cut flowers, the qualitative analysis of the mandala-drawings and the essays showed statistically significant tendency to balance, centeredness and calmness over time in the floral group.

DEDICATION

To my family for their support and love

Thank you for being in my life

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I would like to thank my advisor, Dr. David H. Rosen, for trusting me and supporting me in my efforts to make dreams come true. I would like to thank my committee members, Dr. Steven M. Smith and Prof. James Lee Johnson for their guidance and support throughout the course of this research and for their courage to undertake with me this research. I would like to thank Dr. Aaron Taylor for his patient guidance along the paths of quantitative analysis.

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INTRODUCTION

What is the connection between archetypal creativity and healing? Does archetypal creativity have a healing influence or impact on individuals leading to a sense of well-being, increase of hope and spiritual meaning? This study proposed to scientifically investigate this by researching floral design as a form of archetypal creativity.

Archetypes, Embodied Cognition and Image Schema

In studying archetypal creativity, we have first to define the object of our study. Therefore, our investigation starts going back to the idea and the definition of the archetype. It was C.G. Jung who defined the archetype in the context of analytical psychology as ancient motifs and predispositions of universal ideas, images, or patterns of behavior. Jung took up this term which appears already in "Philo Judaeus in reference to the *Imago Dei."* (Archetypes and the Collective Unconscious, CW, Vol.9, Part I, p. 4). This term denotes archaic, universal images that have existed as long as humanity has and Jung used it to express the form of the pattern of instinctual situations and images which is given *a priori* and without which instinct cannot exist. These archetypes, which represent patterns of behavior and are infused with distinctly numinous character when they appear, although they have affinity with instinct, can be said to represent the authentic element of spirit which is not identified with human intellect. (On the Nature of the Psyche, CW, Vol. 8, p. 206) As images of instincts they are "a spiritual goal toward which the whole nature of man strives". As such they are the basic elements

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This thesis follows the style of *Psychology of Aesthetics, Creativity, and the Arts.*

of what he defined as the deepest layer of the psyche - the collective unconscious.

Archetypes-as-such are unknowable. They manifest symbolically as archetypal images in dreams, myths, fairy tales, religious symbolism and creative art products. We experience their effects in consciousness through their ability to organize experience. These qualities of archetypes-as-such allowed Jean Knox (2003) to hypothesize that they might be what cognitive semantics call image schemas. Organizing experience or mastery over it tends to make us feel better by increasing hope, meaning and well-being (Rosen, 2002; Mascaro & Rosen, 2005; Henderson, Rosen & Mascaro, 2006).

What this means to the theory of the archetype and analytical psychology we can see only after defining image schemas. Image schemas are believed to be the earliest forms of representations formed in the infant's brain. Mark Johnson defines it as a "dynamic, recurring pattern of organism-environment interactions" (M. Johnson, 2007, p.136). They are "structures of sensorimotor experience that can be recruited for abstract conceptualization and reasoning" (Ibid., p.141). They are "preverbal and mostly nonconscious"(Ibid., p.144), and represent a form of "emergent level of meaning" (Ibid., p. 144). Image schemas are used by Johnson in his theory of embodied cognition which aims on the basis of findings from modern neuroscience to break the long tradition of split between body and mind in Western civilization expressed in the profound dualism of body versus mind, thought versus feeling (M. Johnson, 2007). Image schemas code perceptual experience and are the basis of conceptual thought and abstract concepts due to such mechanisms as iconic memory and metaphoric extension. Embodied cognition argues against a representational theory of mind where we have mental images which

represent the outer world to the inner mind. Although image schemas are in a sense representational, they are the precise structures that lead to the realization that there are no concepts that represent reality, but concepts are “neural activation patterns that can either be “turned on” by some actual perceptual or motoric event in our bodies, or else activated when we merely think of something without actually perceiving it or performing a specific action” (M. Johnson, 2007, p. 157). Essentially concepts are seen as an abstraction of encoded form of experience in the body, i.e. they are grounded in sensorimotor aspects of experience. Conceptual metaphor is a mechanism through which abstract concepts are defined by systematic mappings from body-based, sensorimotor source domains onto abstract target domains (M. Johnson, 2007).

Before returning to the question of archetypal creativity, I would like to stress another aspect of the theory of embodied cognition which pertains to the study of archetypal creativity and healing, namely the place of feeling and emotion in the process of meaning making through the limbic system. Emotions are believed to maintain our touch with our environment. Johnson’s theory of embodied cognition considers them to be key components of complex processes of assessment and evaluation of our immediate reality as well as in the process of transformation that ensures adaptive response to it. If concepts are considered to be an expression of a bodily process of discrimination and relation, emotions acquire an essential place in the understanding of situations, events, persons and objects.

Assuming an image schema can be equated with the archetype-as-such (Knox, 2003), Jean Knox then points out that the metaphoric extension of the image schema is equivalent to an archetypal image.

Archetypal Creativity and Healing

From a traditional Jungian perspective archetypal creativity can be defined as an act of creativity in which the driving force is beyond the ego of the person. It also involves an experience and bringing awareness to it. In terms of embodied cognition theory, it is this aspect of the meaning making process which is often carried out automatically and beyond conscious awareness. This deeper meaning also involves emotions, as defined above, as an active part of an on-going process of evaluation of internal states, assessment of situations and interactions between environment and organism. Archetypal creativity in a certain sense is the process of bringing awareness to this experience and its meaning making aspect and giving expression to it. For example, these are the feelings of awe when a mother holds her baby and spontaneously hums a tender and original lullaby to the newborn.

According to proponents of the embodied cognition theory (M. Johnson, 2008) this aspect of meaning-making and cognition has been largely neglected in the philosophic discourse of western civilization leading to an essential misunderstanding of the arts and aesthetics and to a disembodied notion of the mind reflected in a dualistic view of body and mind. Johnson argues that such a position of the arts and aesthetics in western ontology mislead as to the role of art for full human development. Restricting meaning to the propositional meaning of language leaves out essential parts of the

experience of meaning making and the bodily mechanisms that underlie it. Johnson concludes “Many people will be shocked that the best place to discover the nature of meaning, language and thought (and therefore of science, philosophy and politics) may be in our experience of art”. (M. Johnson, 2008, p.48)

As discussed, the contention is that archetypal creativity is healing for the individual. Here healing is defined not in terms of recovery from illness and is studied not in a semantic space delineated by the opposition of health-illness, but in terms of well-being, as a way of achieving wholeness. If we use the metaphors of embodied cognition theory we could say that healing here is understood as letting ourselves become aware of the non-propositional aspects of meaning that lie in the experience in the body and “is typically not available in our day-to-day affairs” (M. Johnson, 2007, p.261). Healing then occurs when we leave the realm of linguistic, conceptual meaning and focus on the non-conceptual, embodied experience as meaning. In other words, healing would be the experience of peace and wholeness that comes when one goes beyond the ego (like in meditation) and creates an artistic product (as in active imagination). This can be studied by measuring levels of anxiety and depression before and after creative activity, such as floral design or ikebana.

How central this aspect of the definition of healing is even for the analytical practice of Jungian psychology can be seen from the importance that Jung himself gives to his method of active imagination as a form of archetypal creativity. Active imagination was defined by C. G. Jung as “his method of psychotherapy”(Chodorow, 1997, p.17) and as a way to self-knowledge and the process of individuation (Chodorow,

1997). It can be described as the space and the means of relating to aspects of the personality and the psyche as a whole beyond the ego through which awareness is achieved, consciousness is enriched and healing can occur. Thus healing comes as a result of the efforts of the person himself/herself. Jung and the tradition of analytical psychology study a number of creative expressions of the products of active imagination such as sand play, drawing, clay modeling, writing, dancing and psychodrama. The difference between the creative process in the arts and active imagination as a creative process is outlined by Joan Chodorow as having the first center around the aesthetic product and having the second center around the changes of the personality but both result in a creative artistic product (Chodorow, 1997).

Ikebana and Floral Design

Archetypal creativity can find expression in artistic form and in the process of active imagination which concentrates on the changes of the personality, in awareness, integration and differentiation, rather then on aesthetic aspects of a particular artistic technique. However, the question arises can we so clearly divide the two? If we take the tradition of the Japanese way-arts (*geido*), known also as Zen arts we have to clearly say that learning the technique of the art is indispensable from transformation of the personality (hence these are also known as spiritual practices). The tradition of the way-arts shows that blending of the two is possible and we would like to suggest that floral design (ikebana) is an example of such a union.

The artistic and aesthetic expression of an experience of the ‘truth about existence’ (in Buddhist terms) or experience of archetypal nature in Jungian terms has

been since centuries the essence of a number of arts in Japanese culture such as the way of tea (tea ceremony) (Sotirova-Kohli, unpublished), the way of the flower (ikebana), the way of writing (calligraphy) and the way of poetry (haiku) (Stephenson et al, 2008; Rosen & Weishaus, 2004). The training in these arts encompasses not simply learning the artistic techniques but also the process of change of the personality of the practitioner in addressing different aspects of the unconscious following the old teachings, their differentiation and integration into consciousness in a process towards wholeness (‘enlightenment’ in Buddhist terms).

The way of the flower, ikebana, is believed to have been started by a Buddhist monk who expressed his admiration of Nature and the ‘Divine’ through offerings of arrangements of wild flowers to the Buddha on the temple altar. Later, the ritual is known as *kuge* and served as the basis for developing the oldest familiar to us today style of ikebana – *rikka.* The name of the art *ikebana* as is known already in the west consists of two words *hana* – flower and *ikeru* – to give life, literary *ikebana* can be translated as flowers that are being given life. The leader of the oldest school of ikebana *Ikenobo* describes the essence of the way-art of ikebana as follows:

> The theme of ikebana is life. . . We also are an essential part of this flow of life and in the gentle curves of the branches of ikebana we sense the achievement of a beautiful moment of harmony . . . In ikebana . . . we try to fully reveal life's single purpose.
>
> (Shoka Shimputai Ikenobo, in Servomaa, 2005, p.21)

The essential skill which the practitioner is required to develop in his/her training is explained by Sonja Servomaa as a feeling understanding of nature. (Servomaa, 2005) Servomaa ‘s assertion could be paraphrased as the nonconceptual, primarily unconscious and embodied way that meaning arises in our experience (of nature) (M. Johnson, 2007). In other words, the training of the artist blends acquisition of technique as well as learning a skill of understanding/meaning building beyond conceptual knowledge or awareness of the embodied aspects of cognition. In this sense, the way of the flower can also be defined as a form of archetypal creativity in which expression is given to a deeper sense of meaning which lies beyond ego-rationality and propositional thinking and represents an experience of archetypal nature. The original form of the oldest style of Ikebana *rikka* can be said to represent a mandala in which each branch or flower is used as an ‘instrument’ to express the ultimate law of the universe (in Taoist and Buddhist understanding) (Nakamura, 1997). Interestingly, it was flowers that were used to express the idea of all encompassing wholeness. Research shows that flowers in themselves are a symmetric design reminiscent of the principles of the mandala and which proves to attract not only humans but also insects (bees) exactly by virtue of this quality. A research team from the Australian National University could prove that bees respond innately to some features of natural flowers, resulting in a spontaneous preference for radiating, as well as symmetrical patterns (Lehrer et al., 1995). The ability to recognize symmetric vs asymmetric patterns is studied in other animal species as well (Swaddle & Pruett-Jones, 2001; Swaddle & Johnson, 2007; Delius & Novak, 1982; Giufra, Dafni & Neal, 1999). It is also noteworthy that the creative activity of drawing

mandala has been empirically proven to be healing by reducing symptoms of post traumatic stress disorder (Henderson et al, 2007).

Flowers have played an active role in the life of all peoples and all cultures although their creative use might have been attributed different place in the respective culture. In the West artistic use of flowers has formed the basis of floral design. “Flowers alone … are able to express the deepest feelings; as a result floral art is in a category apart from other arts…” (J. Johnson, 2001, p. 4). Although formally floral design does not place especial emphasis on the transformation of the personality of the trainee as is in the case of Ikebana, it integrates as an essential element “a mental picture” (Ibid., p. 92) which is an expression of the subjective “impressions of the subject”. (Ibid., p. 4) These characteristics of floral design qualify it as an artistic form that can be used in archetypal imagination in which working with flowers and plants encourages and facilitates a process of reawakening and awareness of feelings and experiences of the individual which can be healing. However, floral design does not have the focus of Ikebana on development of the personality and self-awareness (spiritual growth).

Plants and Healing

The visual and olfactory effects of plants and natural settings on the sense of well-being of individuals seem to be well-researched. Studies show that exposure to natural environments lead to faster and more complete recovery from stress (Ulrich et al, 1991), shorter hospitalization after surgery and lower need for analgesics (Ulrich, 1984); that foliage plants reduce stress and increase positive responses (Colleman & Mattson,

1995). Floral fragrance affects human central nervous system causing alteration of brainwave activity, as well as changes in mood (Loring et al., 1990, Loring et al, 1991, Yagyu, 1994, Liu, 2001). Furthermore, olfaction is as perception directly associated with olfactory bulbs in the brain and closely linked to the limbic system (Liu, 2001).

In connection with the systematic study of nature, flowers and healing, there is also the tradition of horticultural therapy as well. It is believed that the positive effects of gardening on mental health and recovery were first recorded by Dr. Benjamin Rush in 1812 (American Horticultural Therapy Association, Definitions and Positions). However, it was not before the second half of the 20th century that horticultural therapy evolved. A large number of studies focus on the benefits of growing plants and gardening. Some of the major empirically researched cognitive, psychological, social and physical benefits are summarized by the American Horticultural Therapy Association (AHTA, Definitions and Positions). To our knowledge, there are no empirical studies on the healing nature of practicing floral design/ ikebana.

PURPOSE

The present study aimed to investigate the healing effects of artistic design with flowers which involves education and training plus an element of active imagination and archetypal creativity.

Present Study

Although formally there are recognizable differences between ikebana and western floral design expressed in the concept of space building, spacial use and spiritual focus, we used floral design for our study since it could as an art form in the West be seen as being closest to the nature of ikebana as an art, although it lacks the focus of training in ikebana on self-awareness and integration of the personality.

Floral design (*ikebana*) has remained until now outside the scope of research on active imagination, archetypal creativity and healing. Given its qualities as an art and form of active imagination, we think that empirical study of its healing potential is justified. The aims of this research project were to study the effect training in floral design had on the well-being of individuals and its healing potential.

Hypothesis

We hypothesized that the practice of floral design will reduce physiological symptoms and symptoms of anxiety and depression as well as increase the sense of well-being, hope, spiritual meaning and healthy humility in individuals engaging in this creative activity.

METHOD

Participants

There were two groups of participants in the study – a floral design group (floral group) and a control group.

Floral Group

The participants in this group were undergraduate students from Texas A&M University (TAMU) enrolled in a class of Floral Design for the Fall 2008 semester. The total number of participants in the group was forty (N = 40). The mean age of the group was 21.88 years. In terms of gender, there were 39 women and 1 man in the group. The majority of the students majored in Horticulture (24 students), while 8 students had majors related to Agricultural Science, and the rest Liberal Arts. In terms of ethnicity, the sample consisted of thirty-one people who identified themselves as Caucasian, three as Hispanic, two as Asian and four people did not indicate their ethnicity. As far as religious beliefs are concerned, thirty-six people identified themselves as Christian, one as Buddhist and three did not indicate their religion. Twenty-seven out of the forty participants had already taken at least one floral design class. Thirteen students were for the first time exposed to training in floral design in this class. Twenty-two people admitted practicing currently another form of art in addition to floral design.

Control Group

The participants in this group were undergraduate students from TAMU taking part in research for credit in an Introduction to Psychology course. The total number of

participants in the group was twenty-eight (N = 28). The Mean age of the group was 18.86 years. Twenty six of the participants were women and two were men. The sample had quite diverse majors. None of the participants had horticulture as major, five people majored in General Studies; the rest had majors from Liberal Arts and Engineering. Nineteen of the participants identified as Caucasian in ethnicity, six as Hispanic, two as African Americans and one as Asian. Twenty-six people in the group identified themselves as Christian in religious beliefs, one as Atheist and one as Jewish. Five people admitted practicing a form of art currently; however, none of the participants in this group was involved in a floral design class, nor had taken one in the past.

Procedure

Participants were given a number of tasks to assess their subjective experience of well-being and physiological symptoms as well as symptoms of depression and anxiety at two time points. For the floral group the participants were assessed at the beginning of the class and at the end of the class they were enrolled in. For the control group the assessment took place at the beginning of the semester and at the end.

Time 1

Participants at Time 1 were given and filled out questionnaires which assessed the level of anxiety, depression, and physiological symptoms they experienced. They were also asked to fill out hope, spiritual meaning and healthy humility scales.

In addition to this, after having filled out the questionnaires, participants were asked to create a mandala (circle) and draw inside it any images that came to their mind when they thought of flowers, flower arrangement and floral design. They were

instructed to draw the images just as they came up in their minds without exercising any rational censure.

Subsequent to that the participants in the floral group were asked to write a half page essay explaining the reasons why they chose to take a class in floral design as well as describing their expectations in taking the class.

Time 2

Participants were assessed on the same variables as at Time 1. The same questionnaires were used. They were asked again to draw a mandala with the images that arise in their mind when thinking of flowers, floral design and flower arrangement. They were instructed again to be spontaneous and not to censure the images that came up to their minds. The participants in the floral group were asked once again to write a short essay about their experience of the process of training in floral design and how it changed them.

Measures

Pennebaker Inventory of Limbic Languidness (PILL, Pennebaker, J.W.,1982)

This is a 54-item scale which taps the frequency of occurrence of a group of physiological (common physical) symptoms and sensations. Cronbach alphas range from .88 to .91; two-month test-retest reliability ranges from .79 to .83.

Herth Hope Scale (Herth, 1991)

This is a 30 item self-report measure designed to assess an individual's level of hope. It measures a broad definition of hope that includes goals (agency and pathways), as well as an individual's perceived support and spiritual connectedness to others. The

alpha reliability coefficient for the whole scale is reported to range between .75 and .94 with a three week test re-test reliability of .89 to .91.

Spiritual Meaning Scale (SMS; Mascaro, Rosen, & Morey, 2004; Mascaro & Rosen, 2005)

SMS is a single scale, 15-item self-report inventory that measures spiritual meaning, that is the extent to which a person believes that life, or some force of which life is a function, has a purpose, will, or way in which individuals participate, independent of religious orientation. Psychometric characteristics of the SMS show a one-month test-retest reliability of .84 and an internal consistency of .87.

Healthy Humility Scale (Quiros, 2006)

This 11 item inventory, scored on a 6-point Likert scale, asks participants to rate themselves on characteristics of healthy humility. Healthy humility is defined as "an unexaggerated, open perception of the abilities, achievements, accomplishments, and limitations, of oneself and of others – a perception that focuses primarily, but not exclusively, on the value of the non-self" (Quiros, 2006). The reliability of this measure has been measured to be $\alpha = 0.8285$.

Personality Assessment Inventory, Depression and Anxiety Subscales (PAI, Morey, 1991)

PAI is a 344 item self-report scale which measures symptoms of psychological distress. The Depression scale (PAID) is composed of 24 items scored on a 4-point Likert scale. It consists of three subscales each one of which has 8 items and taps respectively the cognitive, affective and physiological components of depression.

The Anxiety scale (PAIA) consists as well of 24 items scored on a 4- point Likert scale, which are divided in three subscales Affective Anxiety, Cognitive Anxiety and Physical Anxiety, each one of which is of 8 items. The coefficient alphas for the depression and anxiety subscales were found to be 0.87 and 0.90, respectively (Morey, 1991).

RESULTS

Both quantitative and qualitative analyses of the data were conducted**.**

Quantitative Analysis

Individual Assessment Measures

Means and standard deviations for all variables at Time 1 and Time 2 in both groups separately are shown in Table A-1, Appendix A. (All tables and figures can be found in Appendix A.)

Analysis

Data analyses were conducted using the statistical package SPSS, version 15.0 for Windows, and SAS 9.2.

First of all the correlation of all variables to themselves over time was investigated. All variables were statistically significantly correlated with themselves over time. This promotes the use of ANCOVA in the analysis of the data to be able to partial out the variance accounted for by the measure at baseline and to be able to investigate only the variance which is a result of the treatment condition – creative work with cut flowers. (Table A-2) The patterns of correlations between spiritual meaning, humility and the other measured variables observed in our study are congruent with previous research. (Mascaro et al., 2004; Mascaro & Rosen, 2005; Quiros, 2006)

Independent samples t-test on all variables was conducted to compare the two groups at baseline. Only the t-test for the measure of healthy humility at baseline was statistically significant ($t = 2.280$, $p < 0.026$, Table A-1) which suggested that there were statistically significant differences between the floral and the control groups at Time 1.

None of the other t-tests which were conducted was significant. These results suggest that although some differences on the variables could be observed only the difference on healthy humility was statistically significant.

A series of paired samples t-test on all variables for each group separately were conducted as well to test for changes over time in the group itself on all the measured variables. Only the t-test for healthy humility in both groups was significant (Floral group HHS $t = 2.618$, $p = 0.013$; Control group $t = 2.193$, $p = 0.037$, Table A-1 and Figure A-1). These results suggest that both groups experienced an increase of healthy humility over time. It is noteworthy that at baseline there were also statistically significant differences between the two groups on the measure of healthy humility.

A series of one-way analyses of covariance (ANCOVA) comparing the experimental and control group were conducted for all measures at Time 2. Because the two groups had different initial levels of spiritual meaning, hope level, healthy humility, depression, anxiety and physiological symptomatology at Time 1, the use of ANCOVA as opposed to analysis of variance was warranted. Using ANCOVA allows to detect mean differences between groups at Time 2, while controlling for differences at baseline. Although baseline differences between groups were not statistically significant, they were large enough to warrant the use of ANCOVA. All variables were correlated with themselves over time, and this also spoke to the importance of using ANCOVA.

The covariate for each ANCOVA was the value for the respective variable at the beginning of the study (Time 1) while the group was treated as a fixed factor. We were interested in the significance of the F-ratio for group in each of the ANCOVA

conducted. None of the F-ratios for group in any of the ANCOVA analysis was significant. This suggests that there was no statistically significant change over time on any of the assessed variables as a result of participation in the floral design class. (SMS F-ratio for group = 0.885, p = 0.350; Herth HS, F-ratio for group = 0.242, p = 0.624; HHS F-ratio for group = 3.682, p = 0.059; PAID F-ratio for group = 0.000, p = 0.992; PAIA F-ratio for group = 0.307, p = 0.581; PILL, F-ratio for group = 0.112, p = 0.739). It is worth mentioning that the F-ratio for group in the analysis of covariance of healthy humility over time was marginally significant (F = 3.682, p = 0.59, Figure A-1). This finding is particularly interesting because both groups were statistically significantly different on this measure at baseline and both groups showed statistically significant improvement over time on the measure within the group. It is worth considering the possibility that these results are connected with a decreased sensitivity of the scale at its end (Figure A-1).

Furthermore to test whether the practice of another form of art apart from floral design had a significant effect on change over time in the groups, a series of analyses of covariance were conducted for each variable in which both group and practice of another form of art at the time of the study (arts) were in the fixed factors while the measure of the variable at baseline was in the covariates. None of the F-ratios for the effect of practice of art on change over time or the interaction between floral design practice/lack of it (group) and practice of other art forms (arts) were significant. This suggests that there was no effect of the practice of an art form in addition to floral design or by itself on the change over time of the participants on all measures in the study.

To determine if there were any differences in the development over time of the participants in the floral group that had had already classes in floral design (N = 27) and those who were in their first class of floral design (N = 13), a series of ANCOVAS were conducted on each of the measured variables comparing the two subgroups within the floral group. No statistically significant differences were found in the changes over time of the people who participated in their first class of floral design and those who had already taken other classes.

A series of ANCOVA with linear contrasts on all measures were conducted as well comparing the two subgroups with one another and each subgroup with the control group separately. However none of the F-ratios for contrast were significant which suggests that there were no statistically significant differences between the groups depending on whether the class during which the participants were assessed was their first class or not.

Conclusions

No significant changes over time were found after conducting the analyses as a result of participation in a floral design class. Only healthy humility exhibited tendency towards increasing at a marginally significantly rate over time in the floral group and statistically significantly over time in each group independently.

Qualitative Analysis

Assignment Explanation

Both floral and control groups were asked to draw a mandala and draw inside it all the images that come up in their mind when they think of flowers, flower

arrangement and floral design; they were instructed not to be judgmental towards the images and to give their mandala a title. Both groups were asked to draw the mandala after having done the questionnaires at the two time points when they were assessed. The groups received identical instructions, work sheets and crayons.

The mandala drawings in our study were used as a symbolic means of expression of the state of mind of the participants at the two time points of assessment. This kind of evaluation has been done before and proved useful in this kind of creative exercise. (Henderson et al., 2007)

Criteria for Analysis

The mandalas were analyzed in several steps. At first five members of the Positive and Analytical Psychology research team at TAMU went through the mandalas independently and proposed criteria for analysis and comparison of the drawings. The members of the team agreed on four categories with a number of subcategories for each to be used in the analysis of individual mandalas.

The four categories and their subcategories for analysis of the individual drawings were as follows:

1. Composition - Centeredness, symmetry/ asymmetry, abstraction, inclusion of words in the drawing.
2. Theme - Flowers, landscapes/nature, bouquet, vase/pot to grow plants, people, objects – sun, clouds, insects, heart, smiling face.
3. Color - No color (drawing in pencil or pen with no colors used), color (general impression of brightness or darkness)

4. Title - Match to drawing (literal, metaphoric), words used in title

The mandalas were assessed once again and analyzed on the basis of these categories. Tables with counts of the presence of each category and its subcategories at Time 1 and at Time 2 were prepared for both floral and control groups. These were used to compare the groups.

In addition to the categories for analysis of the individual drawings, a rating system to assess change over time in each group on the basis of the drawings at Time 1 and Time 2 was developed.

The rating system consisted of three categories - positive change, negative change and no change.

Positive change (T1 – T2): Tendency towards being more centered, more balanced, more symmetric, more dynamic, more settled, brighter. If the respective pair of mandala drawings demonstrated at least one of the above as a major feature it was rated as a positive change.

Negative change (T1 – T2): Tendency to restriction of freedom/dynamism or transition from open space/landscape to representation of encapsulated life (as in vases or flower pots) could be noted.

No change (T1 – T2): No structural/compositional differences between drawings at Time 1 and Time 2 could be observed, and the general impressions of the drawings (color and theme) were similar at both times.

These criteria were used to determine tendencies within the group and for the purpose of comparison between the groups. To determine the reliability of the rating

criteria across judges a Cohen's kappa was calculated. Since the variable 'change over time' was a categorical variable, Cohen's kappa statistic was used as opposed to intraclass correlations. Cohen's kappa for two independent raters on ratings of all drawings was k = 0.974 which meets the requirements for excellent agreement and speaks to the reliability of the used criteria across judges.

Comparison Between Floral and Control Group - Analysis

Floral group - Total number of cases 37, total number of drawings 74; three cases were excluded because of missing drawings or drawings not inscribed in a circle.

Control Group -Total number of cases 28, total number of drawings 56.

Composition

Drawings were assessed for centeredness, symmetry, abstraction and inclusion of words (Table A-3).

The drawings in the floral group showed a tendency towards increase of number of drawings which were centered over time while the opposite was observed in the control group.

In the floral group asymmetry dominated in the drawings from Time 1 and symmetry was observed more frequently in the drawings from Time 2. In the control group the number of drawings in which symmetry and asymmetry could be observed stayed almost constant over time. A chi-square test was calculated to test for relationship between presence of symmetry in a drawing and the time point when it was drawn in the floral group. Chi – square ($\chi 2 = 14.1752$, df = 2, $p = 0.0008$) was highly significant which means that there is a statistically significant relationship between occurrence of

symmetry in the drawing and time point of drawing. The Fisher's Exact Test was calculated to test for significance of the relation between symmetry in the drawings and time point of making the drawing for the control group (since 33% of the cells had expected counts less than 5 and chi-square may not be valid, Fisher's exact test was used instead of chi-square). Fisher's Exact Test resulted in a p value equal to 1.000 which demonstrated that there was no statistical significant relationship between occurrence of symmetry and the factor of time in the control group.

There were five abstract drawings in the floral group and none in the control group. The compositional differences between the drawings of the two groups were expressed mainly in the fact that the floral group used verbal images as representations in their drawings, only three drawings in the control group contained words (Table A-3). It is particularly noteworthy that the instructions that were given to the participants clearly stated that they were to draw the mental images that came to their mind when they thought of flowers and floral design and both groups received identical instructions. The linguistic component in the mandals of the floral group did not have the characteristic of part of a visual composition; it was the composition or accompanied the objects which were framed by the circle. The words were used primarily to build the composition of the drawing. Many of the words used denoted emotions, states of mind and familiar people's names or common greetings. A chi-square test was conducted to test if there was a statistically significant relationship between the usage of words in drawings and the group. Chi- square ($\chi 2 = 17.4013$, df = 1, $p < 0.0001$) was highly

significant which means that there is a strong relationship between being in a floral design class and using words in the composition of a mandala.

The presence of verbal images in the drawings of the floral group suggests also that the participants in this group had a more rational and ego-based approach to the topic of flowers and floral design, than the control group. This can be explained by the fact that floral design was a class in the regular academic program of this group.

Theme

The drawings were classified on the basis of the themes that occurred in the imagery with counts of observations for Time 1 and Time 2 in both groups. The themes were not mutually exclusive.

The drawings of the two groups suggested overall differences in the associations each group had with flowers. This was expressed in the frequencies of themes and common objects present in the drawings of each group (Tables A-4 and A-5).

As could be expected, ‘flowers’ was the theme with highest frequency in both groups. While in the case of the control group flowers were used as a part of nature and associated in this context with natural landscapes, in the floral group flowers were associated primarily with emotions and in this respect with relations between people and experience. In other words, the floral group associated flowers with emotions and communication with people while the control group associated flowers primarily with beauty and nature.

The peculiarity of associations each groups had with flowers is expressed also in the other themes of highest frequency observed in each group – landscape/nature for the

control group and objects and people for the floral group (Table A-4). The category of objects represented mandalas with a number of objects often labeled with words contained into a whole by the frame of the circle. Some of the most frequent elements of the compositions were hearts, sun and smiling faces (Table A-5). These elements were used symbolically and often were accompanied with linguistic description such as ‘love’ or ‘happy’ denoting that the respective image was meant to stand for an emotion. It is noteworthy that the symbol of the heart appeared in only two drawings from the control group. The element of sun which appeared relatively frequently in the drawings of both groups (Table A-5) was also used in a different way. While in the drawings of the control group it tended to appear as a natural part of a landscape, in the drawings of the floral group it was used mainly as a symbol with emotional content accompanied with text. Three independent chi-square tests were calculated to test for statistical significance of relation between high frequency of landscape, objects and people as themes and group. All of the chi-square tests were significant (landscape*group $\chi2 = 19.9851$, df = 1, $p < 0.0001$; object*group $\chi2 = 14.2678$, df = 1, $p < 0.0002$; people*group $\chi2 = 7.5988$, df = 1, $p = 0.0058$). These results suggest that mandala drawings of landscape are significantly related to participation in the control group, while drawings with people or sums of objects (objects) are significantly related to membership in the floral group. Two further chi-square tests were calculated to test the relationship between using hear or a smiling face in the drawing and being in the floral group. Both of these tests were significant (heart*group, $\chi2 = 12.4741$, df = 1, $p = 0.0004$; smilingface*group, $\chi2 = 12.9760$, df = 1, $p = 0.0003$) which shows that there is a statistically significant

relationship between using hearts and smiling faces in the drawing and being in the floral group.

Color

The drawings were classified on the basis of being drawn in color or just in pencil/pen. The drawings drawn in color were further classified on the basis of how bright they were. Table with counts of observation was prepared (Table A-6).

There were more drawings in the floral group which were drawn with pen/pencil without the use of color. The number stayed relatively stable over time

The drawings in color of the floral group showed a tendency towards increasing brightness and decrease in number of dark drawings. The tendency observed in the control group was in the opposite direction towards decrease of the number of brighter drawings and increase in number of the drawings in dark colors. A chi- square test was calculated for each group to determine if there was a statistically significant relationship between brightness of the drawing and the time point when it was drawn. The chi-square for this relation was significant in the floral group ($\chi 2 = 8.1316$, $df = 2$, $p = 0.0171$) while it was not significant in the control group. These results suggest that there is a statistically significant relationship between brightness of the drawing and being drawn at Time 2 in the floral group. (Table A-6)

Titles

The titles of the floral group tended to be more metaphoric while the titles of the control group exhibited a tendency towards being more literal in relation to the images of the drawing. The frequencies of some of the more commonly used words in the titles

of the two groups support the observations that the floral group associates flowers mainly with positive emotions and experience (love, life, positive emotion), while the participants in the control group associate flowers with nature (names of seasons, beauty, nature) (Table A-7).

Change Over Time

Changes over time in the drawings of the participants from both groups are summarized and shown in Table 8. Tendency towards positive change in the direction of centeredness (Figure A-2), brightness/colorfulness (Figure A-3) and balance (Figure A-4) could be noticed in thirty-one (31) cases of the floral group. The positive tendency observed in the control group was not expressed in terms of change towards balance, symmetry and centeredness. Six cases of the control group were rated as representing positive change over time (Figure A-7), but this tendency was more related to a sense of liberation/freedom then to centeredness, balance and brightness.

Three cases from the floral group were rated as negative (Figure A-5) while in the control group twelve cases received this rating (Figure A-8). The tendency which prevailed in the control group was transition from open space/dynamism/landscape to representations of vase/flower pot (9) and restriction of dynamism/loss of color (3) which was rated as negative. Only in one case from the three cases in the floral group rated as negative such transition was observed.

It was also noteworthy that in 10 cases in the control group no change of structure (Figure A-9), dynamism or color could be observed. Such tendency could be observed in only three cases of the floral group (Figure A-6).

To determine whether there was a statistically significant relationship between creative work with flowers and positive tendency observed over time, a chi – square analysis was conducted. The observed chi-square ($\chi 2 = 25.28$, df =1) was statistically significant at $p < 0.005$ level. In other words, creative work with cut flowers is associated with positive changes over time.

Conclusion

The observed differences between the groups suggest that the two groups had different relationship to flowers. While the floral group had more rational and emotional attitudes expressed in the compositional characteristics of their drawings, the control group had more aesthetic associations to flowers. The fact that being in a floral design class was statistically significantly associated with positive change over time can be explained by the above observation – no change can occur without the active participation of the ego as an agent. This can also be considered to be an expression of the healing effect of archetypal creativity which could not be measured in terms of levels of anxiety, depression, hope, spiritual meaning or healthy humility, but was expressed in their mandalas by the positive tendency towards balance, centeredness and symmetry.

Essays

The participants in the floral group were asked at both times of assessment to write an essay about their work with flowers and the motivation behind taking a floral design class. They were instructed to write their essays after having finished the drawing of the mandala to ensure spontaneity in drawing. Most participants (27 out of 40) pointed out having already taken floral design classes before the one during which they

took part in the study which was reflected in the contents of their essays at Time 1. It is noteworthy that seven (7) students mentioned having changed their major after taking their first floral design class and one of the people for whom this was the first floral design class wrote that “in the mid semester (she) almost thought of changing her major”.

The most common motivations to take a floral design class can be summed up as professional interest (future career), loving flowers, wanting to be creative, enjoying to make other people happy, communication of feelings/expression of feelings, search for inspiration and search for oneself (see Appendix B).

The participants described feelings of joy and happiness associated with the work with flowers and related to being able to express oneself, to feel a part of nature, to communicate feelings to others, make other people happy and enjoy the beauty of nature.

Some participants described feelings of a sense of accomplishment when working with flowers, feeling happier and more creative. More than half of the people directly pointed out that floral design is a form of relaxation and stress relief (21 people) and a form of therapy (3 people). Four people pointed out that floral design brings ‘a smile on their face’, in their own words (Appendix B, Participant A) (which is expressed also in the frequency of use of smiling face as an element in the mandalas, Table A-5).

Two people pointed out in their essays that floral design is not just a form of creative entertainment for them, but also a business/industry (an art with its rules). One person pointed out feeling restricted in her creativity by the rules of the floral

compositions and several people pointed also the business aspects of floral design which were not associated with pleasant feelings.

Conclusions from the Analysis of Essays

The positive experience associated with creative work with cut flowers that was described in the essays, was congruent with the positive tendencies observed in the drawing of the mandalas over time.

DISCUSSION AND CONCLUSIONS

Discussion

The positive feelings expressed in all essays associated with floral design draws the attention to existing aspects of the impact of the work with cut flowers which were not assessed for in the present study. Taking into consideration the feelings and experiences of people expressed in the essays it seems reasonable to suggest the potential fruitfulness of assessing for creativity, levels of stress, joy, love and happiness in future studies of similar sort. It is very well possible that the lack of statistically significant results in the present study is related to the fact that the areas where change was present were not assessed.

It also deserves attention that the majority of people in the floral group (27) were not beginners and had already taken at least one class of floral design previous to the one when they took part in the study. Although no statistically significant differences were observed over time between the subgroup of beginners and the subgroup of already trained students, it would be of particular interest to investigate the subjective experience of other populations of floral design trainees, such as beginners before their first class and at the end of it. It would also be important to study the effects of creative work with cut flowers on people from the community who take a floral design class not as part of their degree plan, practitioners of traditional ikebana outside the academic system and to conduct cross-cultural investigations. As the essays of the participants in the floral group showed the motivation to take the class was not always purely intrinsic and not essentially focused on self-awareness and inner growth which might be another reason

for the results of the study. It would also be interesting in future studies to prescreen participants for symptoms of trauma and observe how their symptom presentation is affected by creative work with flowers over time as in the study of Henderson et al. (2007) on drawing mandalas.

The findings from the control group in relation to their representations of flowers and images associated with flowers raise some questions as well. Since no significant differences over time were observed between the two groups and the control group created mandalas noteworthy in its representations of beauty and nature, it is worth asking whether the very ability to maintain a relationship (even if it is just imaginary) to nature is not a resilience factor in the life of undergraduate students. It is also unclear whether the observed tendencies in the drawings of the control group could not be explained by the environment of the small college town where the students live. It would be interesting to investigate whether similar tendencies can be observed in the drawings of students in big metropolitan areas where the daily contact with nature is different, for example. It is also not clear how the assignment to draw a mandala with images associated with flowers and floral design at Time 1 has affected the measures at Time 2. Although the drawing of the mandalas was not intended as a therapeutic intervention, it is well possible that it might have had such an effect since research shows that drawing mandalas reduces symptoms of trauma at one month follow up (Henderson et al., 2007). It is noteworthy that the mandala drawings of the control group had more images of nature than the drawings of the floral group.

The analysis of the essays of the floral group in relation with the observed tendencies in the drawings of the participants were very fruitful, which suggests that it might be helpful to ask participants in control groups as well to write short essays after they draw the mandala about what they think of flowers and floral design.

It is worth mentioning that replication of the study with subjects involved in Ikebana training as opposed to floral design training might help elucidate the degree to which the two art forms differ in terms of impact on the trainee's sense of well-being.

Conclusions

Even though no statistically significant improvement was found on the levels of depression, anxiety, physiological symptomatology, hope, spiritual meaning and healthy humility in connection with the effect of creative work with cut flowers, this study demonstrated that there is an impact of creative work with flowers on people through the statistically significant positive change observed over time on the basis of analysis of the mandala drawings. The essays and the drawings of the participants suggested that work with flowers facilitates stress-relief and is associated with being balanced. They also demonstrated possibilities for improvement of the design of experiments in future studies. The qualitative assessment provided us with description of the positive subjective experience of the participants which suggests that the lack of statistically significant findings might be also related to the choice of assessment measures. For instance, using measures of emotion, stress level and creativity possibly would have demonstrated the differences between the Floral and the Control Groups.

As a first study of its kind, this study contributes to our understanding of the subjective experience of people working with flowers. This can facilitate the refinement of the experimental approach towards the study of the effects of creative work with flowers on the well-being of people. It also showed the strengths and the importance of using qualitative methods of assessment of subjective experience in psychology in addition to quantitative analyses.

REFERENCES

Chodorow, J. (ed.) (1997). *Jung on active imagination*. Princeton New Jersey: Princeton University Press.

Coleman, C. and Mattson, R. H. (1995). Influence of foliage plants on human stress during thermal biofeedback training. *HortTechnology, 5(2),* 137-140.

Delius, J. D. & Nowak, B. (1982). Visual symmetry recognition by pigeons. *Psychological Research, 44,* 199-212.

Giufra, M., Dafni, A. and Neal, P. R. (1999). Floral symmetry and its role in plant-pollinator systems. *International Journal of Plant Sciences, 160 (6),* 41-50.

Griffiths, A. E., and Griffiths, L. W. (1976). Healing through horticulture. *Journal of Leisurability, 3(1),* 29-35.

Henderson, P., Rosen, D. & Mascaro, N. (2007). Empirical study of the healing nature of mandalas. *Psychology of Aesthetics, 1(3),* 148-154.

Herth, K. (1991). Development and refinement of an instrument to measure hope. *Scholarly Inquiry for Nursing Practice, 5(1),* 39-51.

Johnson, J. L. (2001). *Flowers: Creative design*. College Station: San Jacinto Publishing Co.

Johnson, M. (2007). *The meaning of the body.* Chicago: The University of Chicago Press.

Johnson, M. (2008). Body meanings: Are the concepts we use to derive meaning from experience and build our theories about the world just the product of disembodied abstract thought? Far from it. *New Scientist, 197,* 46-48.

Jung, C. G. (1973). *Mandala symbolism*. (R. F. C. Hull, Trans.) Bollingen Series. Princeton, NJ: Princeton University Press. (Original work published 1959)

Jung, C. G. *The Collected Works of C. G. Jung.* New York: Pantheon Books Inc.

Knox, J. (2003). *Archetype, attachment, analysis: Jungian psychology and the emergent mind.* Hove and New York: Brunner-Routledge.

Knox, J. (2001). Memories, fantasies, archetypes: an exploration of some connections between cognitive science and analytical psychology. *Journal of Analytical Psychology, 46,* 613-635.

Lehrer, M., Horridge, G. A., Zhang, S. W. & Gadagkar, R. (1995). Shape vision in bees: Innate preference for flower-like patterns. *Philosophical Transactions: Biological Sciences, 347,* 123-137.

Loring, T. S., Herman, K. B. & Schwartz, G. E. (1990). EEG activity during administration of low-concentration odors. *Bulletin of the Psychonomic Society, 28(5),* 405-408.

Loring, T. S., Huffman, E., DeMartino, A. & DeMarco, J. (1991). The effects of low-concentration odors on EEG activity and behavior. *Journal of Psychophysiology, 5,* 69-77.

Liu, M. (2001). *Visual and olfactory effects of flowers and floral fragrance on human psychophysiological, emotional and cognitive responses.* Dissertation submitted to the Department of Horticulture, Forestry and Recreation Resources, College of Agriculture, Kansas State University, Manhattan, KS.

Mascaro, N., Rosen, D., & Morey, L. C. (2004). The development, construct validity, and clinical utility of the spiritual meaning scale. *Personality & Individual Differences, 37(4),* 845-860.

Mascaro, N. & Rosen, D.H. (2005). Existential meaning's role in the enhancement of hope and prevention of depressive symptoms. *Journal of Personality*, *74*, 985-1014.

Morey, L. C. (1991). *Personality assessment inventory professional manual*. Odessa, FL: Personality Assessment Resources, Inc.

Morey, L. C. (1999). The Personality assessment inventory. In M. E. Maruish (Ed.), *Use of psychological testing for treatment planning and outcomes assessment* (2nd. Ed.) (pp 1083 - 1121). Mahwah, NJ: Erlbaum.

Nakamura, J. (1997). *Enjoying Rikka (Rikka-o tanoshimu).* Kyoto: Nihonkadosha.

Pennebaker, J.W. (1982).*The Pennebaker inventory of Limbic Languidness (the PILL): The psychology of physical symptoms*. New York: Springer-Verlag.

Quiros, A. (2006). *The development, construct validity and clinical utility of the healthy humility scale*. Dissertation submitted to the Department of Psychology, College of Liberal Arts, TAMU, College Station, Texas.

Rosen, D. (2002). *Transforming depression*: *Healing the soul through creativity*. York Beach, ME: Nicolas-Hays, Inc.

Rosen, D. & Weishaus, J. (2004). *The healing spirit of haiku.* Berkeley, CA: North Atlantic Books. .

Saunders, P. and Skar, P. (2001). Archetypes, complexes and self-organization. *Journal of Analytical Psychology, 46*, 305-323.

Servomaa, S. (2005). Nature of beauty – beauty of nature. *Dialogue and Universalism, 1-2*, 19-28.

Shoka Shimputai Ikenobo. (1988). *An invitation to Ikenobo*. Kyoto: Ikenobo Headquarters.

Sotirova-Kohli, M. (unpublished). *Beyond language: About the Zen practice of tea ceremony from a Jungian perspective.*

Stephenson, K., Rosen, D. & Henderson, P. (2008). The healing nature of haiku: An empirical study. Poster presented at a Multidisciplinary Academic Conference of the IAAP & IAJS, Zurich, Switzerland.

Swaddle, J. P. and Pruett-Jones, S. (2001). Starlings can categorize symmetry differences in dot displays. *The American Naturalist, 158(3),* 300-307.

Swaddle, J. P. and Johnson, C. W. (2007). European starlings are capable of discriminating subtle size asymmetries in paired stimuli. *Journal of the Experimental Analysis of Behavior, 87(1),* 39-49.

Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science, 224*, 420 - 421.

Ulrich, R. S., Simons, R. F., Losito, D. B., Fiorito, E., Miles, M. A. & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology, 11,* 201 - 230.

Vaillant, G. E. (2008). *Spiritual evolution: A scientific defense of faith*. New York: Broadway Books.

Yagyu, T. (1994). Neurophysiological findings on the effects of fragrance: Lavender and jasmine. *Integrative Psychiatry, 10,* 62-67.

APPENDIX A

Table A-1

Individual Assessment Measures for Floral Group and Control Group

	Floral Group (N = 40)		Control Group (N = 28)	
Assessment	M	SD	M	SD
SMS				
Time 1	66.83	8.849	64.71	8.228
Time 2	67.85	7.029	64.82	11.176
Herth HS				
Time 1	59.38	6.640	58.43	5.846
Time 2	59.69	5.347	59.50	6.708
HHS				
Time 1	56.15*	5.829	52.75*	6.363
Time 2	58.05**	4.367	54.39***	5.573
PAID				
Time 1	49.68	3.778	49.54	5.621
Time 2	49.58	5.425	49.50	4.290
PAIA				
Time 1	45.10	5.305	45.18	6.092
Time 2	45.08	7.416	45.86	6.305
PILL				
Time 1	120.95	23.374	125.21	25.421
Time 2	118.60	23.094	123.11	26.353

M - mean
SD – standard deviation
* - signifies significant difference on HHS between the floral and the control groups at baseline, $p < 0.026$
** - signifies significant change over time on HHS within the floral group, $p = 0.013$
*** - signifies significant change over time on HHS within the floral group, $p = 0.037$

Table A-2

Correlations between All Measures

	SMS T.1	HerthHS T.1	HHS T.1	PAID T.1	PAIA T.1	PILL T.1	SMS T.2	HerthHS T.2	HHS T.2	PAID T.2	PAIA T.2	PILL T.2
SMS T.1	1	.619**	.728**	-.203	-.316**	-.215	.797**	.617**	.526**	-.213	-.315**	.006
HerthHS T.1		1	.655**	-.164	-.107	-.038	.565**	.750**	.456**	-.115	.009	.135
HHS T.1			1	-.114	-.124	-.226	.725**	.700**	.730**	-.090	-.117	-.075
PAID T.1				1	.391**	.119	-.085	-.057	-.046	.428**	.266*	.139
PAIA T.1					1	.287*	-.216	-.164	-.161	.438**	.665**	.306*
PILL T.1						1	-.011	-.056	-.243*	-.001	.335**	.717**
SMS T.2							1	.696**	.667**	-.095	-.162	.109
HerthHS T.2								1	.567**	-.123	-.054	.095
HHS T.2									1	-.038	-.115	-.109
PAID T.2										1	.550**	.086
PAIA T.2											1	.498**
PILL T.2												1

*- denotes statistically significant correlation at p< .05 level
**- denotes statistically significant correlation at p< .01 level

Table A-3

Compositional Characteristics of the Drawings of the Floral and the Control Groups

Compositional characteristic	Floral Group (N = 74)		Control Group (N = 56)	
	Time 1 counts	Time 2 counts	Time 1 counts	Time 2 counts
Centeredness	7	9	10	6
Symmetry	8	21*	9	8
Asymmetry	25	9	19	19
Abstract	2	3	0	0
Inclusion of ** words in drawings	15	12	1	2

* - chi-square for relationship between symmetry and time point in the floral group was significant ($\chi 2$ = 14.1752, df = 2, p = 0.0008), chi-square for the same relationship in the control group was not significant.

** - chi-square for relationship between usage of words and membership in floral group was significant ($\chi 2$ = 17.4013, $p < 0.0001$).

Table A-4

Theme Counts in Floral Group and Control Group

Theme	Floral Group (N = 74)		Control Group (N = 56)	
	Time 1 counts	Time 2 counts	Time 1 counts	Time 2 counts
Flowers	32	28	25	26
Landscape/* Nature	2	4	11	12
Vase/ Flower Pot	13	6	9	13
Bouquet	9	2	3	3
People **	9	6	3	0
Objects ***	21	16	4	6

* - chi-square for relationship between drawing landscapes and being in the control group was significant ($\chi 2 = 19.9851$, $p < 0.0001$)

** - chi-square for relationship between drawing people and being in the floral group was significant ($\chi 2 = 7.5988$, $p = 0.0058$)

*** - chi-square for relationship between drawing on the theme of objects and being a member of the floral group was significant ($\chi 2 = 14.2678$, $p < 0.0002$)

Table A-5

Counts of Common Objects in Floral Group and Control Group

Objects	Floral Group (N = 74)		Control Group (N = 56)	
	Time 1 counts	Time 2 counts	Time 1 counts	Time 2 counts
Insects	2	1	6	3
Clouds	3	2	2	3
Sun	9	11	10	6
Heart *	13	7	1	1
Smiling ** face	9	9	1	0

* - chi-square for relationship between drawing hearts and being in the floral group was significant ($\chi 2$ = 12.4741, p = 0.0004)

** - chi-square for relationship between drawing smiling face and being in the floral group was significant ($\chi 2$ = 12.9760, p = 0.0003)

Table A-6

Characteristics of Color in the Mandalas of the Floral and the Control Groups

Characteristics of color		Floral Group (N = 74)		Control Group (N = 56)	
		Time 1 counts	Time 2 counts	Time 1 counts	Time 2 counts
No color		13	11	0	2
Color	Bright	14	24*	23	16
	Dark	10	2	5	10

* - chi-square for relationship between brighter colorful pictures and time point of drawing in the floral group was significant ($\chi 2 = 8.1316$, $p = 0.0171$); in the control group the test was not significant.

Table A-7

Frequency of Usage of Words in Titles of Mandalas for Floral and Control Groups

Theme	Floral Group (N = 74)		Control Group (N = 56)	
	Time 1 counts	Time 2 counts	Time 1 counts	Time 2 counts
Flowers	5	2	7	3
Life	5	1	1	1
Love	5	2	0	0
Color	1	1	3	2
Names of Seasons	0	0	7	3
Beauty	0	0	4	1
Nature	0	0	3	1
Positive emotions	1	7	1	0

Table A-8

Summary of Observed Tendencies over Time in Both Groups

Tendency	Floral Group (N = 37)	Control Group (N = 28)
Positive change	31*	6
Negative Change	3	12
No Change	3	10

* - chi-square for relationship between creative work with flowers and positive change observed over time was significant ($\chi 2 = 25.28$, $p = 0.005$)

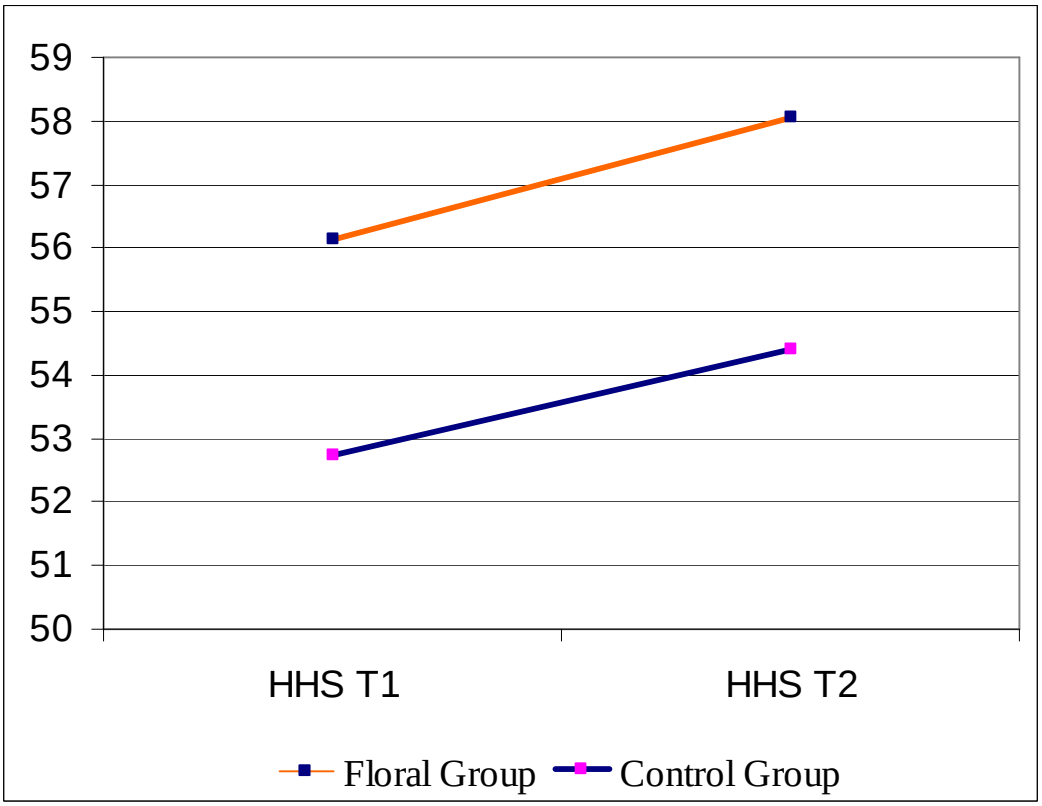

Figure A-1 *Means of Floral and Control Groups for Healthy Humility at Time 1 and Time 2*

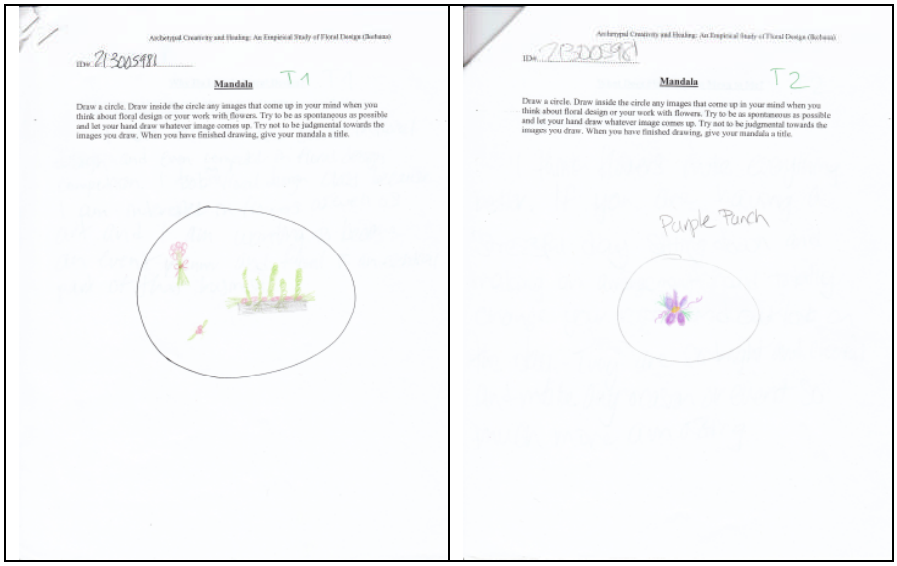

Figure A-2 *Positive Change over Time – Tendency towards Centeredness (Floral Group)*

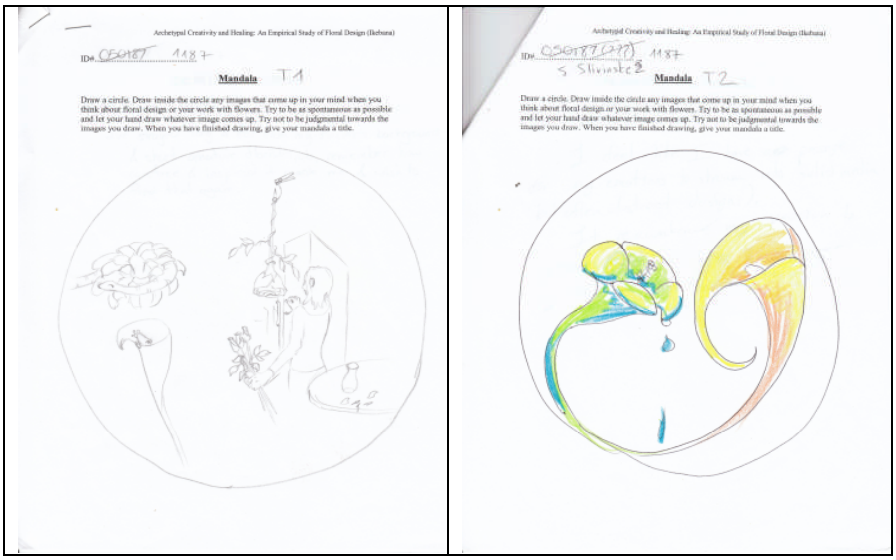

Figure A-3 *Positive Change over Time – Change from No Color to Color (Floral Group)*

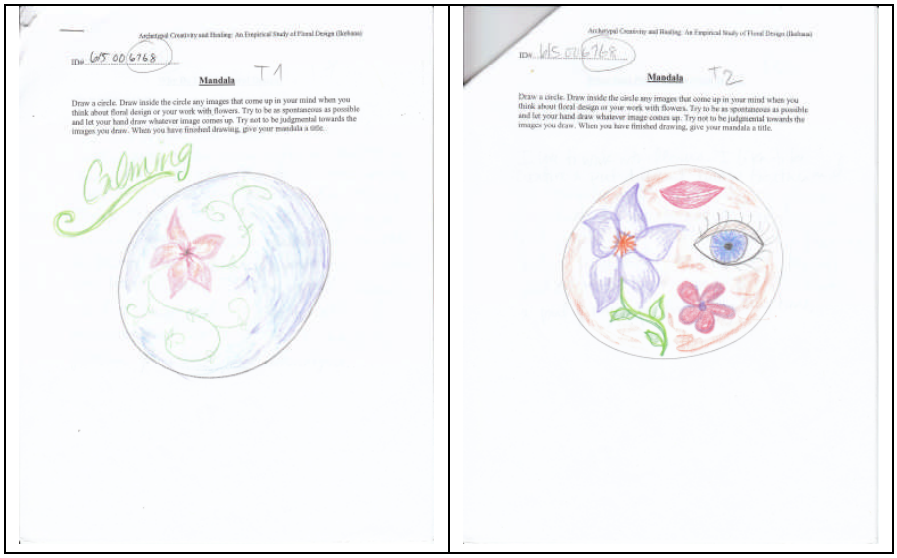

Figure A-4 *Positive Change over Time – Change Towards Balance/Symmetry (Floral Group)*

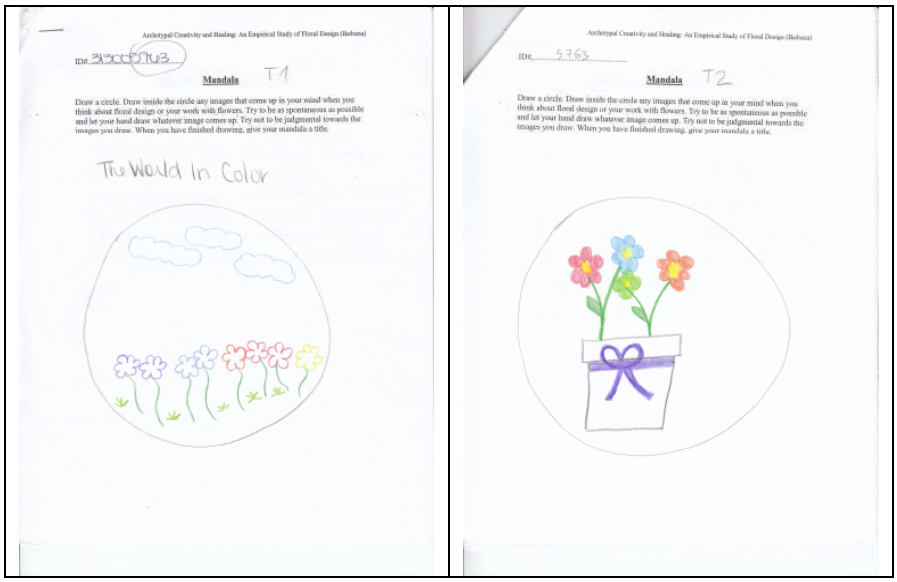

Figure A-5 *Negative Change over Time (Floral Group)*

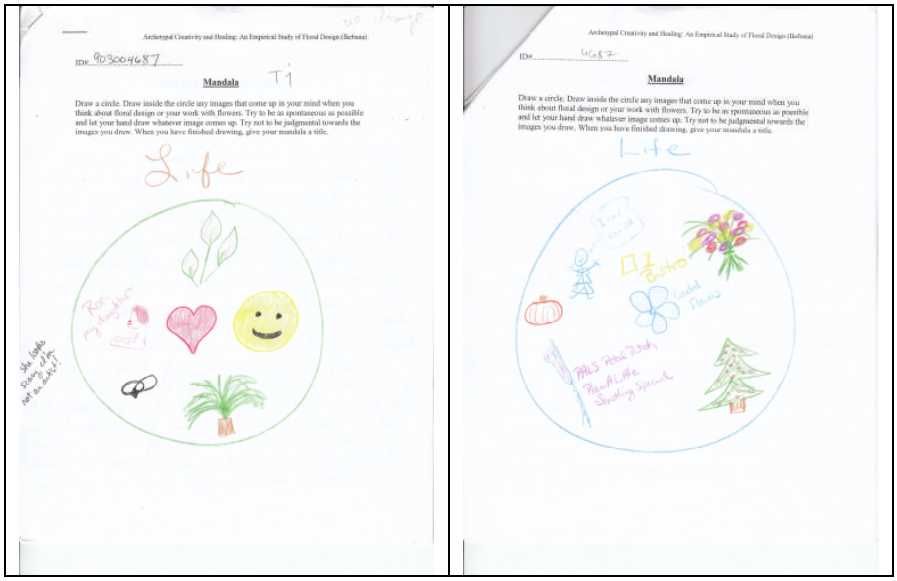

Figure A-6 *No Change over Time (Floral Group)*

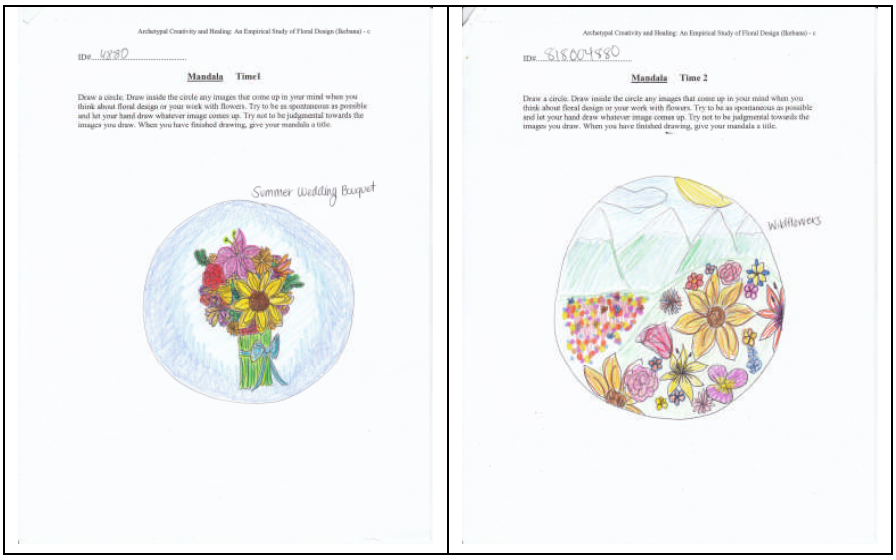

Figure A-7 *Positive Change over Time (Control Group)*

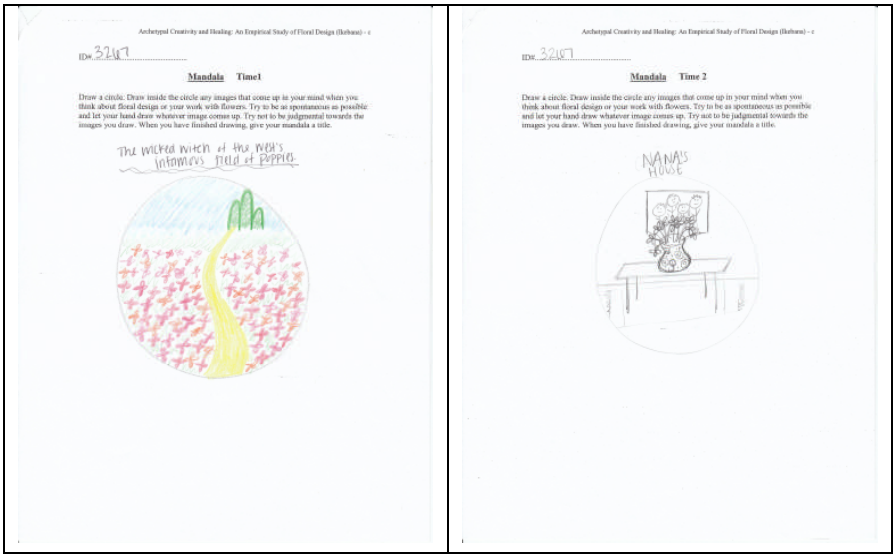

Figure A-8 *Negative Change over Time (Control Group)*

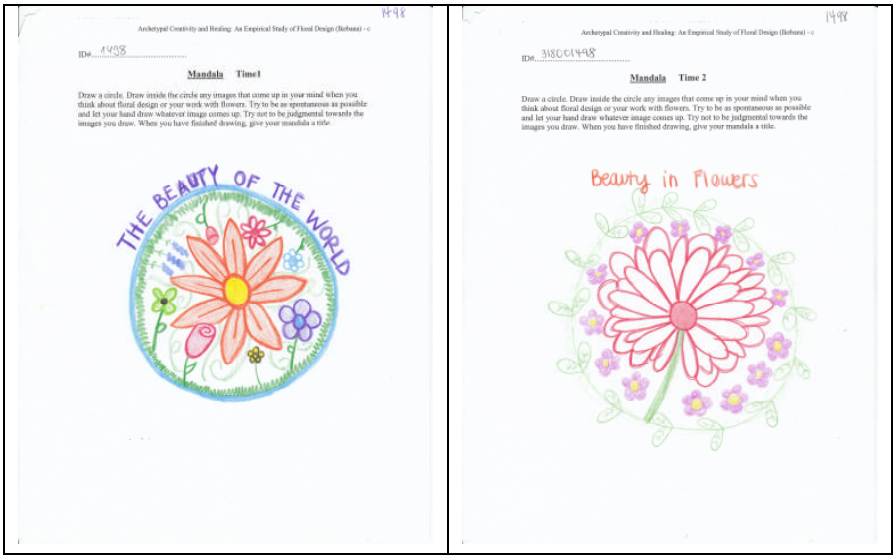

Figure A-9 *No Change over Time (Control Group)*

APPENDIX B

Excerpts from Essays

Participant A
Time 1 Essay
"…One day I saw a lady who was arranging flowers in the church. At that time I had just lost my husband in a car accident. I was so sad and depressed that time. I was looking for something to do for the next chapter of my life with my sons. … I felt that my soul felt comfort. Therefore, I made a decision to study floral design. …"

Time 2 Essay
"At the beginning of this semester I did not know much about floral design... Now, I have found something which I can do and I want to be. While I was working with flowers, the flowers changed me. The flowers helped me. The flowers gave me a smile. So I got a mind that …'lives like flowers"…"

Participant B
Time 1 Essay
"…After my first class I fell in love with the talent that I had discovered within myself. From that moment on I knew I wanted that love to always be a part of my life, no matter what it would take."

Time 2 Essay
"Floral design for me is my way of life. When I am working in class or at work, I feel calm and don't even feel that I am actually doing work. …"

Participant C
Time 1 Essay
"The first course I took in floral design was an introductory course…It was a big shock to me how much fun I had doing the designs…"

Time 2 Essay
"Working with flowers is relaxing to me and a way to bring joy to others. It is fun to make someone's day better while enjoying what I am doing…"

Participant D
Time1 Essay
"I love to be work with flowers. I like to be creative with them using different designs and colors…I feel very happy when I bring home a design that I have made. I love to walk into my room and see it. I like to watch the flowers open and look beautiful."

Time 2 Essay

"I love to work with flowers. I like to be creative…I like to see the reactions that people have when they see the flowers…"

VITA

Milena Sotirova-Kohli received her Master of Arts degree in Japanese Studies from Sofia University “St. Kliment Ohridski” in 1995. She entered the Clinical Doctoral program at Texas A&M University in September 2007. Ms. Kohli received her Master of Science degree in Psychology in August 2009. Her research interests include analytical psychology, creativity and language. She has specialized in Japanese language and culture at the University of Kyushu in Fukuoka with a scholarship from the Japanese Ministry of Education. She has a teaching license in Ikebana – School of Senke Kogi, and in Tea Ceremony – School of Urasenke. Ms. Sotirova-Kohli has taken part in numerous cultural activities related to Ikebana and Tea Ceremony in Japan and Bulgaria. She has published translations and scholarly articles on Japanese culture and language.

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