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The development of creativity: a study of creative adolescents and young adults

Laycraft, Krystyna Czeslawa

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The Development of Creativity:
A Study of Creative Adolescents and Young Adults

By

Krystyna Czeslawa Laycraft

A DISSERTATION
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
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Abstract

The idea for this dissertation has been incubating in my mind for many years. Since 1994, I have been involved in creative pursuits that have given me enormous joy, delight, and satisfaction. I used to spend every weekend in the Rocky Mountains observing, sketching, and photographing, and after each of these escapades I would return home feeling happy, full of energy, and ready to deal with the challenges of my daily life.

A decade later, free from my previous responsibilities as an educator and concentrating only on my artistic profession, I found myself slowly returning to my first love, physics—especially chaos theory and the idea of self-organization. What to do with it? One day, I had an “Aha!” moment: “I’ll apply it to the study of my own artistic experience.” After many years of self-studying a variety of theories of psychological development, I finally found Dabrowski’s theory of positive disintegration, which connected my emotional experiences as an artist with my thinking as a physicist. The theory of positive disintegration describes patterns and explains internal processes of human development.

Dabrowski stresses the importance of “emotional turbulence,” such as nervousness and psychoneurotic symptoms in the process of transition from the lower to the higher levels of mental life. This idea converges with Prigogine’s theory of dissipative structures where far-from-equilibrium conditions are essential for the spontaneous emergence of new structures and new forms of behavior.

With these conceptual tools, I felt ready to create something new. To my two dimensions as artist and physicist, I added a third one: educator. And finally, this three dimensional “me” wrote this dissertation.

The purpose of my study was to investigate what role creativity may play in young people's psychological development. Creativity is understood as an observable and identifiable process. The research focuses on whether young people use this process to gain the capacity to differentiate and integrate their own inner experiences in order to achieve internal dynamic order and find direction in their future.

The integral model was used to map a variety of theories and their relationships in a form of meaningful organization, and serve as a conceptual tool to enhance our understanding of the process of development and creativity.

To gather data for this qualitative research, I chose *hermeneutic phenomenology/ontology* linked with *narrative/biography methods*. For the process of the interpretation of the data, I created conceptual models, called *pattern models*, of the process of creativity for seven participants. The *pattern models* are based on the concepts of complexity science, Dabrowski's theory of positive disintegration, and various emotion theories.

Based on the life stories of the participants, it is proposed that creativity in young people could be defined as "self-organizing dissipative structures" that originate spontaneously in a far-from-equilibrium state created and maintained by complex emotions such as delight, curiosity, enthusiasm, love, passion, and resourcefulness. These emotions are the driving forces generating order and complexity not only in the creativity of young people but above all in their psychological development.

It appears important to integrate a variety of disciplines in order to achieve a better understanding of the complex process of the emotional development of adolescents.

Acknowledgments

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I wish to thank all of my participants who opened their hearts and shared with me their life experiences and creativity. I learned greatly from them and they influenced me deeply.

I wish to thank Dr. Helen Diemert who ignited my interest and passion for art and provided the basic knowledge of artistic techniques. I sincerely appreciate her support, great friendship and her ever present encouragement of my artistic pursuits.

I wish to thank my husband Brian who was always supportive during my journey through this pursuit, listened patiently and constantly questioned my ideas. This helped me to rethink and justify my premises.

I wish to thank my daughter and son for their love and thought provoking comments.

I wish to thank my parents who gave me a great upbringing and provided me with happy memories of my childhood and adolescence. I thank my father for constantly challenging me, and my mother for her love and understanding.

Dedication

This dissertation is dedicated to my grandsons,
Kasper, Jakub, Oskar, Robert, Konrad, and Gabriel.

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CHAPTER ONE: WHY CREATIVITY?

Introducing Myself

Why creativity?

As a high school student, I was fascinated by the power of mathematics as a language for physical phenomena. I enjoyed the mental challenge of working on physical problems and I found great joy and satisfaction upon solving them. This was also a period of discovery for me, in that I began expressing my newfound interest in nature through poetry and drawing. At the end of high school, I decided to study theoretical physics for two reasons: “physics is a very challenging subject and physics is discovering secrets of nature.”

I remember, my excitement, throughout university, of discovering shapes of complicated mathematical functions after long and exhausting calculations. These functional images were always a happy surprise for me and kept me going on.

Many years later, when I was working as a scientist on the Aurora Borealis at the University of Calgary, I was fascinated by the beauty of the forms, patterns, and colors of this phenomenon. I tried to find its nature, to touch its secret using the language of mathematics and physics. This was a time (early eighties) when better tools for dealing with this dynamic and complex phenomenon were becoming available. I started to learn and apply new concepts of chaos theory like attractors, bifurcations and feedbacks.

Unfortunately, my love affair with the Aurora Borealis ended after five years (a camera failure on the satellite) and I had to decide what to do next.

After rethinking my life, I decided to shift my focus completely by immersing myself in the business world. So, I decided to open a high school for international students. This was a very challenging period for me; I had to stretch myself, not only intellectually, but also emotionally

and physically. After many years of running this school, I was really exhausted, and approaching a dangerous state of breakdown.

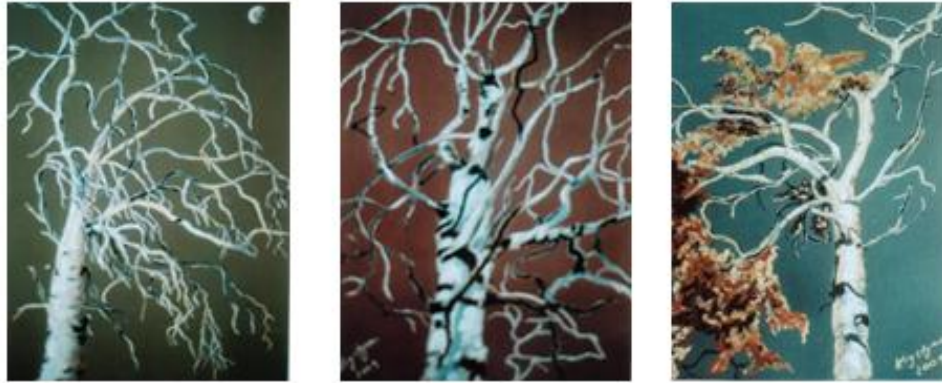
At times I think I was born under a lucky star: at this crucial point my closest friend called to invite me to a series of lectures on fundamental arts which she was giving at the university. This was a really happy surprise and I accepted her offer with all my heart. I felt intuitively that it would be very important for me. As a result, I found something special, something that changed my life. I fell in love with the process of being by myself, being a part of nature, deeply observing, noting, and catching the beauty of trees, wild flowers, streams, and clouds. I was inside of this GREAT PHENOMENON, and I felt enormously liberated and stimulated by its existence. I felt like everything around me begged me: *touch me, look at me, hug me, paint me...* Every weekend, I escaped to the Rocky Mountains for my rendezvous with nature and created a series of drawings, paintings, and photographs. From these trips, I returned home energized, extremely happy and fulfilled. I became more open, more sensitive and more compassionate toward my students and teachers. Thus I was able to run my school more efficiently and even more elegantly by decorating it with my paintings and photographs. Then I opened a small gallery and organized art shows for creative students and friendly artists. Teachers started to join me, bringing with them new ideas and activities, such as making masks and using them for improvisations, taking students to “Loose Moose Theatre” and organizing school concerts. Our school started to breathe with new creative air.

After many years passed, my life changed, and I resided on a ranch in the foothills at the base of the Rocky Mountains. I decided to be a full time artist. I created series of paintings of trees, clouds, and fields in pastels and acrylics. Later, I created twenty artworks expressing concepts of chaos theory and sixty four small pieces based on the oldest Chinese book, the *I Ching*, or *Book*

of Changes. But deep inside of me was the ever present scientist who wanted to understand why I do this, why I feel so great when I am drawing, painting, or photographing, why I don't feel tired afterwards, why I have more energy to do more and more, why I am so attracted to it, why I spend so many hours thinking about my next artistic projects, why I feel so good being around other artists, and many more whys.

I tried to answer these questions by studying Jung's, Roger's, Maslow's, and others' psychological theories, but still I was not satisfied. Finally I found Dabrowski's theory of positive disintegration which helped me touch a secret of the process of creativity. When I started reading Dabrowski's books I felt their enormous familiarity with and similarity to complexity science—especially to the idea of self-organization. Professor Kazimierz Dabrowski gave me a beautiful tool to study creative people, their emotional development and their creativity.

I hope that this dissertation throws some new light on the process of creativity and its role in our growth as human beings.



Conceptual Framework and Definitions

In order to locate my research topic in the overall context of existing literature and research, I review the main theories related to the process of creativity and its relation to human development. In terms of fundamental theorizing about human development, I review Merleau-Ponty's phenomenology of perception, Piaget's theory of knowledge development, Heidegger's and Gadamer's hermeneutic phenomenology, Dilthey's theory of understanding human life, Dabrowski's theory of positive disintegration, Vygotsky's theory of social development, and the neurophenomenology of Varela and Freeman. In searching for explanatory frameworks, I focus on the main concepts of chaos theory and self-organization and their application to the emotional processes. I am aware that self-organization is particularly useful for modeling the coming into existence of new forms or properties through internal processes of the system. Finally, I review Dabrowski's theory of positive disintegration and show how this theory could be

reconceptualized by using chaos theory, self-organization and the affect-spectrum theory, and applied to the study of creative people.

The review of the literature demonstrates the complexity of the process of creativity and its role in human development. Wilber's integral theory provides an excellent conceptual framework for the journey through the different areas of study. I am aware that, to understand this phenomenon, I should study it through psychological, biological (neuroscience), cultural, and social perspectives.

The visionary theorists like Merleau-Ponty, Piaget, Vygotsky, Dilthey, and Dabrowski understood the importance of emergent forms and gave a foundation for the contemporary approaches, applying the concepts of self-organization, by Varela, Izard, Lewis, Freeman, and others.

Finally, I present a variety of definitions of creativity, and place them on the eight zones of Wilber's quadrants (Figure 1).

My own definition of creativity, as it arose from this study, is the "self-organizing dissipative structures" that originate spontaneously in a far-from-equilibrium state created and maintained by complex emotions.

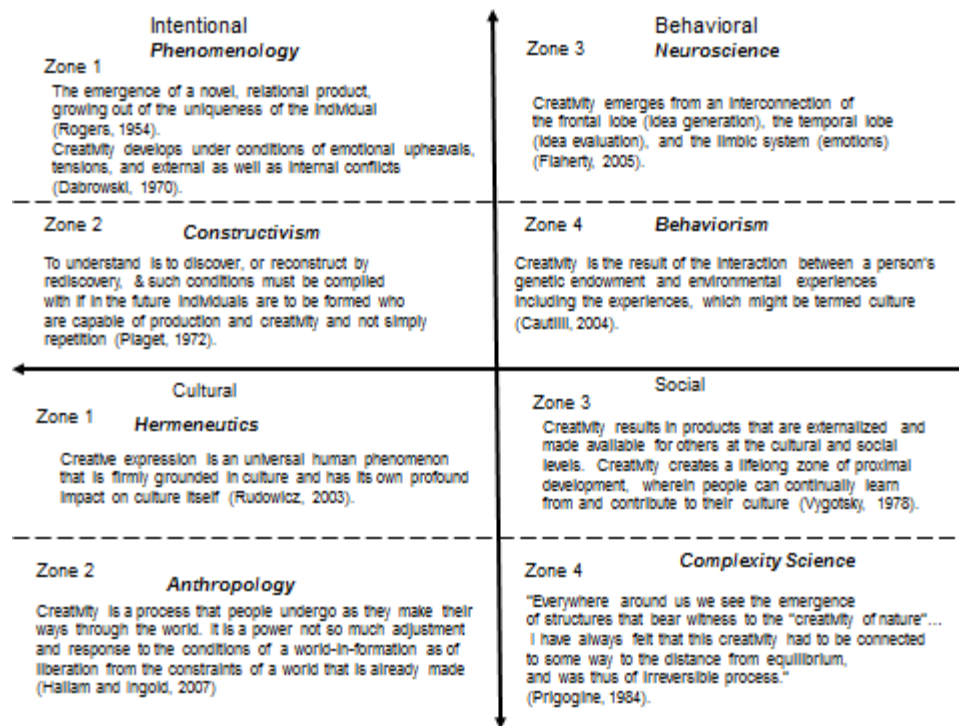


Figure 1 Major definitions of creativity organized in Wilber's quadrants

Research Problem

Adolescence is a turbulent period of transition from childhood into adulthood, during which an individual acquires the skills necessary to survive on her own away from her parents. During this time, it is crucial for young people to spend time reflecting on themselves, examining themselves, and considering their future. This is a period of self-identity formation and searching for meaningful values. Because of the enormous changes in their brains and bodies, adolescents experience a flood of emotions. They become more sensitive to both the external and the internal world. This sensitivity attracts them to new experiences, which create a wider spectrum of feelings, inner tensions, and conflicts with themselves and their environments (school, family, peers). The resulting processes of anxiety, depression, dissatisfaction with oneself, fear, guilt, etc., are essential for positive changes in their mental structure.

The research problem addressed by this study is: What is the role of creativity during the period of adolescence and the transition from adolescence to young adulthood?

The Purpose of this Study

The purpose of this study is to investigate creativity in young people and its role as a component of their psychological development.

Creativity is understood as an observable and identifiable process. The research investigates whether adolescents spontaneously use this process to gain the capacity to differentiate and integrate their own distant inner experiences in order to enable themselves to achieve internal dynamic order and find direction for their futures.

The following questions are designed to organize the research project and to focus data collection, in fulfilling the primary purpose of this study.

The research problem (“What is the role of creativity during the period of adolescence and the transition from adolescence to young adulthood?”) is addressed through a set of research questions, grouped into six focal areas: cognitive awareness, emotional access, interpersonal skills, moral capacity, spiritual experience and self-identity.

Cognitive awareness:

What role does creativity play in the cognitive development of adolescents?

What roles do motivation, interest, attention, concentration, and openness play in the process of creativity?

Emotional access:

What role does creativity play in the emotional development of adolescents?

How does creativity help adolescents deal with their negative emotions?

How does creativity contribute to an increase in the experience of positive emotions?

Interpersonal skills:

What role does creativity play in the development of adolescents' interpersonal skills? How does creativity influence the changes in relationships between adolescents and their family and peers?

Moral capacity:

Does creativity have any role in the moral capacity of adolescents?

Spiritual experience:

What role does creativity play in the spiritual development of adolescents?

Self-identity:

What role does creativity play in the self-identity formation of adolescents?

Assumptions

Assuming that the process of creativity is subjective and multiple, as shown by participants in a study, I decided to use a qualitative design for my research study. Merriam (1988) proposes six assumptions that apply in the qualitative design:

1. The qualitative researcher is concerned primarily with the process, rather than its outcomes or products.
2. The qualitative researcher is interested in meaning.
3. The qualitative researcher is the primary instrument for data collection and analysis.
4. Qualitative research involves fieldwork.
5. Qualitative research is descriptive in that the researcher is interested in the process, meaning and understanding gained through words or pictures.
6. The process of qualitative research is inductive in that the researcher builds abstractions, concepts, and theories from rich data.

Methodology

Although I have already established that taking a qualitative approach to my research was appropriate, it was also necessary to consider the many methodologies within the qualitative paradigm. After considering both the potential contributions and the limitations of each methodology, I chose a *hermeneutic phenomenology/ontology* linked with a *narrative/biography methodology* as the best suited methodology to my research. To understand the process of creativity I studied how young people interpret their lives and derive meaning from what they experience. Most of the questions start with “what,” “how” and “why,” and hermeneutic phenomenology/ontology is highly suited to answering these kinds of questions about human issues and concerns.

Hermeneutic phenomenology/ontology can also be understood as a set of concepts within a domain of interest and the relationships between these concepts. It provides a vocabulary, which can be used to model that domain. As a process of the interpretation of the data of my research, I plan to create conceptual models of the process of creativity of adolescents. The qualitative methodology allows the creation of these kinds of models. These *pattern models* serve as a conceptual tool to enhance our understanding of the researched phenomena. The models are constantly changing, evolving, and transforming, allowing us to have new relationships with the dynamics of studied phenomena.

For the hermeneutic phenomenologist, the biases and assumptions of the researcher are not bracketed, but rather are embedded and essential to the interpretive process. As a researcher, I am aware of my beliefs and their role in the process of research and interpretation. In the process of data analysis in hermeneutic phenomenology, not only is the background of the researcher important, but also her use of imagination and her attention to language and the writing process.

To see something in a new imaginative way is to see it other than how it has been seen before and to integrate it into a new semantic context (Madison, 1988).

I include my knowledge of complexity science not only in the interpretation of the data, but also in the way of researching, in accordance with the philosophy of qualitative research.

From this perspective, I am aware that

Meaningful human research is impossible without the full understanding and cooperation of participants.

Participants are always in relationships with one another and with the investigator as well.

The reciprocal relationship depends on the willingness of the participants to take part in the project and support it.

Participants cannot be separated from their environment.

Inquiry must account for history and detail rather than for permanence and generality.

(Lincoln & Guba, 1985).

Limitations and Delimitations

Since the appropriateness of using qualitative methodology for this research study has already been established, it is not relevant to compare its limitations to the criteria governing quantitative research, such as generalizability. The choice of qualitative methodology, ipso facto, establishes that the findings will not be widely generalizable. The discussion of limitations and delimitations is therefore focused on qualitative methodology, its strengths and its limitations.

The major limitations of conducting qualitative research are that it is time consuming and dependent on the skills of the researcher:

Qualitative research involves fieldwork. The researcher physically has to travel to and observe the environment of the participants.

The volume of data for analyses and interpretation can be overwhelming.

Research quality is completely dependent on the skills of the researcher and willingness of participants to speak honestly.

The researcher has to act as interviewer, observer, facilitator, communicator, and interpreter of data.

The delimitations or reasons for choosing qualitative research are its flexibility and freedom:

The research is not restricted to specific questions and can be adjusted during interviews as new information emerges.

Interviews can be designed with open-ended questions.

Methods are flexible and can be used with a wide range of participants.

Data can be collected in an atmosphere that is not only casual and stress-free, but also safe and trustful.

The mode of research is conducive to creating pattern models for understanding the role of creativity in human development.

Significance

Creativity is an expression of our unique perspective toward situations or problems. Abraham Maslow refers to self-actualization as the need to express our individual talents and become the best that we can. These talents include highly valuable traits such as self-acceptance, spontaneity,

independence, tolerance, altruism, ethics, and the capability of loving others (Wyckoff, 1991; p.24).

This is why we need more creativity! I repeat this slogan after Jan Figel, the European Commissioner for Education, Training, Culture and Youth. He appeals that it is vital for creativity to feature more prominently in business, art and design, and our private lives. European countries understand the need for creativity in schools, and universities. Their creative partnerships programs, organized for millions of children and teenagers, bring creative people such as artists, architects, and scientists, together to work with teachers in order to inspire young people.

I could not find any similar programs in Canada. If the European situation is relevant to Canada, then the role of creativity could be very significant. By introducing creative programs to our schools in a deliberate and coherent manner, we could help young people develop the ability to question, to make connections, to express their thoughts and feelings, to innovate, and to reflect critically. The European experience demonstrates that developing these skills early in life through creativity in schools enriches the lives of young people, opens up new possibilities for them, and greatly extends their vision of themselves and the world they live in. Research on creativity is of necessity in-depth, personal, and small-scale; therefore a number of similar studies carried out across Canada would be needed in order to assess the significance of including creativity in the education of young people. It is reasonable to anticipate that the significance of creativity would be demonstrated as a result of these studies.

Organization of the Dissertation

I have organized this dissertation as a complex structure that includes a variety of different components in the forms of theories, conceptual models, images, poems, paintings, quotations, analysis, and examples. Through the integration of these components, I hope to create a coherent and meaningful entity.

Chapter 1 deals with the research design and the research problem of this study—mainly by introducing myself as a researcher—as well as the chosen methodology and the purpose and significance of this study.

Chapter 2 presents a detailed review of the existing literature and research related to the process of creativity and its relation to human development.

Chapter 3 involves a discussion of the four theories of emotions: the psycho-evolutionary theory of emotions, the affect-spectrum theory, the differential emotions theory, and the self-organizing emotional interpretations theory. These four theories complete each other and provide a better understanding of emotions.

In chapter 4, the theory of positive disintegration as a model for adolescent development is presented, and in chapter 5, an application of the affect-spectrum theory to the theory of positive disintegration is discussed.

Chapter 6 deals with recent research on adolescent brain development.

In chapter 7, the methodology of the research is introduced, and in chapter 8, the results of the research are presented by introducing, analyzing, and interpreting the psychological development and creative processes of seven participants.

In chapter 9, the outcomes of the study, including two modes of mental processing—the mindful and the default network mode—are discussed. The role of creativity in human

development and the impact of creative products on others are reviewed. Finally, comments on the contribution to the understanding of the complexity of adolescent development are presented.

CHAPTER TWO:

MAPPING THE FIELD OF THEORIES AND RESEARCH ON HUMAN DEVELOPMENT AND CREATIVITY

Ken Wilber's integral theory (2008, 2010) serves as a map of the literature on the study of creativity and its role in human development. According to integral theory, there are four major perspectives that must be studied when we are challenging ourselves to fully comprehend any phenomena of reality: the subjective (intentional), intersubjective (cultural), objective (behavioral), and interobjective (social). These perspectives are placed on a plane of x-y coordinates and arranged in four quadrants (Figure 2).

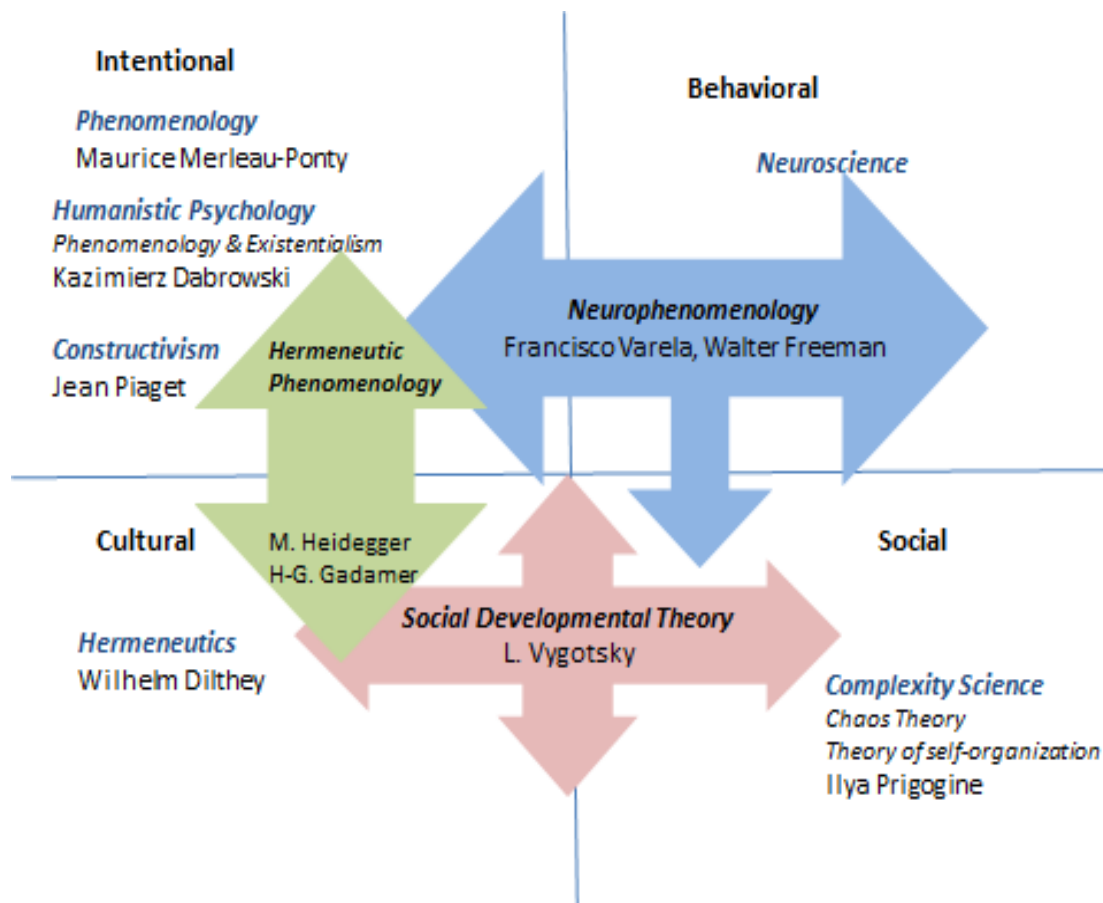


Figure 2 A map for the study of creativity and its role in human development.

The Upper-Left Quadrant – Subjective – Intentional

I start my journey through the literature on the study of human development and the process of creativity with the upper-left quadrant. This quadrant represents the *intentional* first-person perspective.

Phenomenology is the study of the structure of human consciousness as experienced from the first-person point of view, and concerns perception, thought, memory, imagination, emotion and desire, will, embodied action, and social activity. The structure of these forms of experience typically involves *intentionality*—that is, the direct experience of things in the world. Intentional experiences are described as mental acts involving the faculties of perceiving, feeling, remembering, imagining, thinking, empathizing, and so on.

Merleau-Ponty's Phenomenology of Perception

“Essence and existence, imaginary and real, visible and invisible—a painting mixes up all our categories in laying out its oneiric universe of carnal essence, of effective likenesses, of mute meaning”

(Merleau-Ponty, 2004 b, p. 301).

The French phenomenological philosopher Maurice Merleau-Ponty (1908-1961) was the first phenomenologist to identify the *body* itself as the conscious subject of experience, and its power of responding to the world by its faculty of sense.

Central to Merleau-Ponty's philosophy is his emphasis on the foundational role of *perception* (Merleau-Ponty, 2004). He claims that sense-perception is fundamental to being in the world and

is essential to the creative and aesthetic activities of human beings. In his paper “Cezanne’s Doubt” (Merleau-Ponty, 2004 a, pp.272-290), Merleau-Ponty questions the relation between Cezanne’s life and his work. In this excerpt, Merleau-Ponty describes the process of creation undertaken by the artist who wants to paint “as if no one had ever painted before.”

What he expresses cannot, therefore, be the translation of a clearly defined thought, since such clear thoughts are those which have already been uttered by ourselves or by others. “Conception” cannot precede “execution.” There is nothing but a vague fever before the act of artistic expression, and only the work itself, completed and understood, is proof that there was something rather than nothing to be said. Because he returns to the source of silent and solitary experience on which culture and the exchange of ideas have been built in order to know it, the artist launches his work just as a man once launched the first word, not knowing whether it will be anything more than a shout, whether it can detach itself from the flow of individual life in which it originates and give the independent existence of an identifiable meaning either to the future of that same individual life or to the monads coexisting with it or to the open community of future monads. The meaning of what the artist is going to say does not exist anywhere – not in things, which as yet have no meaning, not in the artist himself, in his unformulated life. It summons one away from already constituted reason in which “cultured men” are content to shut themselves, toward a reason which contains its own origins. (Merleau-Ponty, 2004a, p.274)

Merleau-Ponty asks whether the greatness of a work of art is a result of the artist’s strong emotions, feelings of anxiety, sensitivity to beauty, uncertainty, and solitude. He observes that an artist’s life does not explain his work but he agrees that these two are connected in some way. He writes that, “The truth is that this work to be done called for this life. From the very start, the

only equilibrium in Cezanne's life came from the support of his future work. His life was a projection of his future work" (Merleau-Ponty, 2004 a, p. 284). The artist's life and his work are connected in a reciprocal loop, beyond causes and effect: "both come together in the simultaneity of an eternal Cezanne who is at the same time the formula of what he wanted to be and what he wanted to do" (Merleau-Ponty, 2004 a, p. 284).

In his paper "Eye and Mind" (Merleau-Ponty, 2004 b, pp. 290- 324) Merleau-Ponty continues to analyze the process of creation and the role of the artist's body in this process. Merleau-Ponty writes that only "by lending his body to the world, *the* artist changes the world into painting." The artist's body is "not a chunk of space or a bundle of function but that body which is an intertwining of vision and movement" (p.294). Vision and movement are essential to both life and art. Merleau-Ponty claims that creation in art comes originally from the artist's body and from the outside world. "'Nature is on the inside,' says Cezanne. Quality, light, color, depth, which are there before us, are there only because they awaken an echo in our body and because the body welcomes them" (p.296). The artist's creation emerges as a result of concentration or the coming-to-itself of the visible. Art is not mere construction but the internal radiation of the visible in the forms of color, space and depth. An artwork is the actualization of an artist's vision. For Merleau-Ponty, the eye is the "window of the soul" through which the beauty and richness of the universe is revealed.

Merleau-Ponty (2004 b) emphasizes that the artist's quest is never finished. It is a continuous open process of new approaches and new discoveries: "For painters the world will always be yet to be painted" (p. 320). Merleau-Ponty (2004 b) concludes his article "Eye and Mind" with the statement, "If no painting comes to be the painting, if no work is ever absolutely completely and

done with, still each creation changes, alters, enlightens, deepens, confirms, exalts, re-creates in advance all the others” (p. 320).

Dabrowski’s Theory of Positive Disintegration

“Existence through Essence”

(Dabrowski, 1976)

In the quadrant of intentionality, I have also placed Dabrowski’s theory of positive disintegration. Its fundamental thesis is that growth of understanding is a fundamental fact of human mental life. Dabrowski writes: “The appreciation of this fact of mental growth and of the full range of its implications constitutes the key for an understanding of the basic and most complex facts in the mental sphere, particularly for an understanding of what is mental health and mental illness, what is culture and education, for understanding of works of art, of moral and political reality; briefly of anything that belongs to the domain of the humanities” (Dabrowski, et al., 1970, p. 3).

Dabrowski, like the humanistic psychologists (Carl Rogers and Abraham Maslow), believes that every human being has the potential for personality development. But Dabrowski proposes a different kind of development: development through discontinuous psychical levels. This process is not harmonious, peaceful and painless; it requires the experience of sadness, depression, anxiety, and various internal and external conflicts. However, the process still allows for the experience of enthusiasm, delight, and ecstasy.

Dabrowski’s theory combines the philosophical approaches of essentialism and existentialism in a new way. The theory’s approach to human life is much more positive than in existentialist

philosophy; instead of an individual being forced to succumb to the nothingness and despair of existence, she has the power to transcend her present existence, and to make value choices in attempts to transform her essence.

One of the most significant ideas of the theory of positive disintegration is the concept of dynamisms (instinctual-emotional-cognitive forces), which reorganize and organize human growth. An extensive discussion on the theory of positive disintegration is included in chapters 4 and 5, and later on I apply this theory to analyze and interpret the psychological development of my study participants.

Piaget's Theory of Knowledge Development

“The essential functions of the mind consist in understanding and in inventing, in other words, in building up structures by structuring reality.”

(Piaget, 1971)

In this same quadrant, I placed Jean Piaget (1896-1980), a pioneer of constructivist thought who viewed the development of human knowledge as a continuous struggle. For Piaget, the human being is a complex system trying to adapt to a complex environment.

Piaget emphasized the dynamic process of emergence (Piaget, 1962).

He postulates the existence of two functional invariants: *organization* and *adaptation*. Organization refers to the tendency to integrate various experiences by integrating parts into wholes and wholes into more comprehensive wholes. As we interact with the world around us, we tend to organize various parts of our experience into integrated wholes. This is true of perception, memory, language competence, and creativity. We are not passive with respect to our

interaction with the world. This process of organization is similar to the emergence of novel patterns or structures as a result of the self-organization of our mental states. This process involves the appearance of new levels of integration and organization in existing structures, and the spontaneous transition from lower-order states to higher-order states (Lewis, 2005b).

As we organize we also adapt—that is, we tend to adjust to our physical and intellectual world in increasingly more flexible ways. In intellectual development both *assimilatory* and *accommodatory* processes are necessarily involved. Assimilation occurs when new information is integrated into already existing cognitive structures. Basically, we are applying our old thinking to a new situation. Accommodation, on the other hand, occurs when the new information is too complex to be integrated into the existing structures—which means that cognitive structures change in response to new experiences. We have to change our thinking in order to understand our environment (Figure 3).

In Piaget’s theory, the development of knowledge is a nonlinear process, with qualitatively different types of thinking characterizing each stage of the process. Schemas at one stage emerge from the interaction between the activity and schemas of its prior stage. Each stage has an *inherent tension* that propels development to the next stage (Sawyer, 2003).

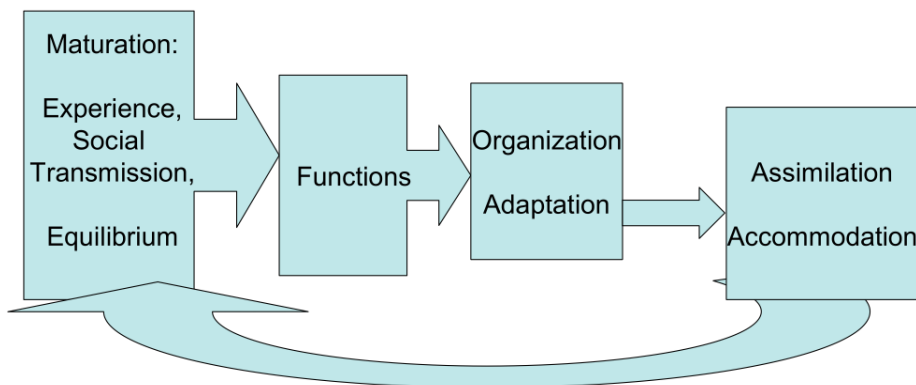


Figure 3 Factors influencing the process of intellectual development by Piaget

The Lower-Left Quadrant – Intersubjective – Cultural

Next, I move to the lower-left quadrant, representing the second-person cultural perspective. I introduce the ideas of the German philosopher Wilhelm Dilthey (1833-1911), who emphasized the importance of situating the human subject in historical and cultural contexts.

Dilthey's Theory of the Understanding of Human Life

"Art is the organ for understanding life."

(Dilthey, 2010, p. 242)

At the turn of the twentieth century, in the Western world, the analysis of social phenomena continues to distance itself from empiricism and the scientific method. Wilhelm Dilthey rejected the continuity of the scientific study of nature and society and stressed the subjective, meaningful character of human understanding. Rather than studying merely the outer, observable manifestations of human action, he explored the inner meaning of human activity. In his book *Philosophy of Life*, he proposed that human studies have to be based on the relationship between *experience, expression, and understanding* (Dilthey, 1976, p. 177). Through our experiences and understanding, we are able to comprehend a *complex whole of life* which contains not only one's lived experiences, but also the experiences of the society and history of which she is a part. Dilthey calls this the *life of all mankind*. All elements of life (the special characteristics of individual persons, their relations, attitudes, conduct, the effect they've had on things and

people) are constantly changing, differentiating. They are in a state of flux. He writes that, “in the course of a life they are internally interwoven and themselves embrace and determine all activity and development” (Dilthey, 1976, p. 178).

Dilthey proposes that the lives of individuals are infinitely enriched by their relationships to their environment and with other people (Dilthey, 1976, p.180). Every individual internalizes these relationships uniquely through their own experiences, values and sense of purpose.

According to Dilthey, the individual person, in his independent existence, is a historical being immersed in the whole web of cultural systems and communities.

Our inner life externalizes in the form of language, actions, creations, and other forms. Dilthey calls this process the *objectification of life*, in contrast with the subjectivity of experience. This means that our inner, private lives are revealed in our external expressions. The main purpose of comprehension is to interpret these expressions as meaningful entities and to project them into another’s inner life (Figure 4). “Every word, every sentence, every gesture or polite formula, every work of art and every political deed is intelligible because the people who expressed themselves through them and those who understood them have something in common; the individual always experiences, thinks and acts in a common sphere and only there does he understand” (Dilthey, 1976, p. 191).

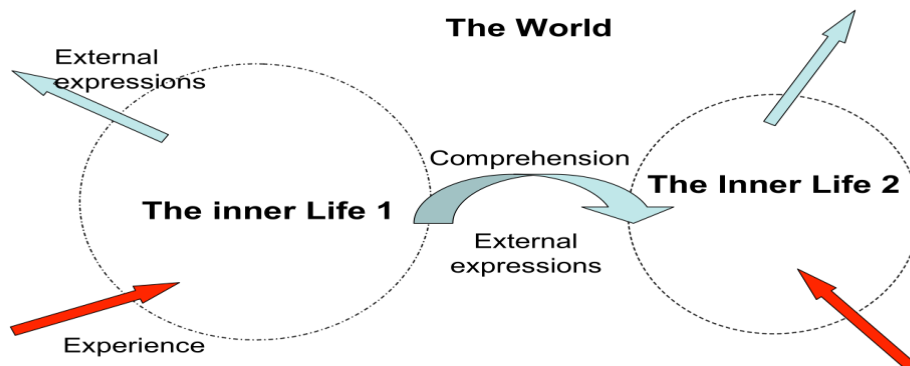


Figure 4 Dilthey's model of the spiritual science as a reciprocal dynamic interaction between "I" and its world

Dilthey's work provided a general foundation for developmental psychology, in that his theory approached human development from the perspective of a developing subject. The value of life is constituted from the richness of life that humans experience, and is influenced by the conditions under which humans live. During the course of development, the subject is able to evaluate his interests, perceptions and ideas and to judge the value of various life options. One of the characteristics of development is the creation of new values that had not yet existed, called creative processes. Dilthey emphasizes that at each stage of spiritual development individuals acquire knowledge and understanding of human life by relating their lived experiences to works of art and to the accomplishments of science (Dilthey, 2010). He writes:

Thus in each of us the understanding of actual life originates through a pervasive interaction of life-experience, representational art, and scientific thought. Through art, history, and abstract sciences, we are more intensely made conscious of the human world that we possess in life-experiences. Through its deepest concerns, the life of each of us is capable of thriving, developing, and taking shape only in this atmosphere of the visual

and representational arts, poetry, history, and scientific thought. Therefore life itself is always historically conditioned without our realizing it. (Dilthey, 2010, p. 243)

Hermeneutic Phenomenology

On the border of the subjective and intersubjective quadrants, the hermeneutic phenomenology of Heidegger and Gadamer is placed. Phenomenological research is descriptive and focuses on the structure of experience, on the organizing principles that give form and meaning to the world, whereas hermeneutics research is interpretive and concentrated on historical meanings of experience and their developmental and cumulative effects on individual and social levels (Lavery, 2003). In short, phenomenology becomes hermeneutical when its method is taken to be interpretive.

Heidegger's Hermeneutic Phenomenology

“The ‘essence’ of Dasein lies in its existence”

(Heidegger, 1962, p.67)

Martin Heidegger (1889-1976), a German philosopher, synthesises phenomenology with hermeneutics. Heidegger's main focus is on the structure of Being or the mode of being human and for him the task of hermeneutics is to understand the mystery of Being. Influenced by Dilthey, Heidegger argues that Being is not separate from the world, but is a formation of historically lived experience, that includes cultural and social contexts. He introduces the concept of pre-understanding as the structure of being in the world or as the organization of a person's cultural background. Heidegger claims that nothing can be encountered without reference to a

person's background understanding. The experience of "being-there" (*Dasein*) can be apprehended through a set of "fore-structures" of understanding, and then expanded through a preliminary grasp of the "existentials" (structure of being), and on to the apprehension of Being itself. Heidegger writes in his famous book, *Being and Time*,

As understanding, Dasein projects its Being upon possibilities...The projecting of the understanding has its own possibility - that of developing itself. This development of the understanding we call 'interpretation'... In interpretation, understanding does not become something different. It becomes itself. (1962, p. 188)

For the further understanding of Being, Heidegger introduces the concept of the "hermeneutic circle" which is located in the lived experience of the interpreter:

This circle of understanding is not an orbit in which any random kind of knowledge may move; it is the expression of the existential fore-structure of Dasein itself. It is not to be reduced to the level of a vicious circle, or even of a circle which is merely tolerated. In the circle is hidden a positive possibility of the most primordial kind of knowing. To be sure, we genuinely take hold of this possibility only when, in our interpretation, we have understood that our first, last, and constant task is never to allow our fore-having, fore-sight, and fore-conception to be presented to us by fancies and popular conceptions, but rather to make the scientific theme secure by working out these fore-structures in terms of the things themselves. (Heidegger, 1962, p. 195)

To understand Being, the interpreter has to participate in the structure of being, immersing himself in the cycle of meaning and interpretation in order to increase her depth of understanding.

Heidegger also points to the moods that make it possible for one to be directed towards something (a goal, a person, an object). “The mood has already disclosed, in every case, Being-in-the-world as a whole, and makes it possible first of all to direct oneself towards something,” (Heidegger, 1962, 176). Being directed towards the world is a matter of vital significance, of things mattering to us: “Existentially, a state-of-mind implies a disclosive submission to the world, out of which we can encounter something that matters to us,” (Heidegger, 1962; p.177).

In his article “The Origin of the Work of Art,” Heidegger treats poetry and art as expressive works for interpreting the nature of truth, language, thinking and being. He claims that to understand the origin of the artwork we must consider not only the work itself but also the process of creation, i.e. the activity of the artist. Heidegger defines creation in terms of “the work-being of the work,” meaning that to create is to cause something to emerge. A work’s becoming a work is the happening of a form of truth, and the occurrence of truth in a work is the bringing forth of a unique being (it occurs once and only once) (Heidegger, 2008).

Gadamer’s Hermeneutic Phenomenology

“The discovery of the true meaning of a text or a work of art is never finished;

It is in fact an infinite process.”

(Gadamer 1975/1989, p. 298)

In his influential work *Truth and Method*, Hans-Georg Gadamer (1900-2002) extends Heidegger’s work into practical application by exploring the role of language, the nature of questioning, the phenomenology of human conversation, and the understanding of the visual and literary arts.

Gadamer argues that *“Every work of art, not only literature, must be understood like any other text that requires understandings, and this kind of understanding has to be acquired....Aesthetics has to be absorbed into hermeneutics”* (Gadamer, 1975/1989, p. 157). He claims that our relationships with artworks are deep and promote self-understanding, and that,

Self-understanding always occurs through understanding something other than the self, and includes the unity and integrity of the other. Since we meet the artwork in the world and encounter a world in the individual artwork, the work of art is not some alien universe into which we are magically transported for a time. Rather, we learn to understand ourselves in and through it...For this reason, we must adopt a standpoint in relation to art and the beautiful that does not pretend to immediacy but corresponds to the historical nature of the human condition. (Gadamer 1975/1989, pp.83-84)

Gadamer continues the idea of the circular movement of understanding and interpretation, writing,

The movement of understanding is constantly from the whole to the part and back to the whole. Our task is to expand the unity of the understood meaning centrifugally. The harmony of all the details with the whole is the criterion of correct understanding. (Gadamer, 1975/1989, p. 291)

The work of hermeneutics, for Gadamer, is not concerned with developing a procedure for understanding, but with further clarifying the condition in which understanding itself takes place: “Hermeneutics must start from the position that a person seeking to understand something has a bond to the subject matter that comes into language through the traditionary text and has, or acquires, a connection with the tradition from which it speaks” (Gadamer, 1975/1989, p. 295).

Like Heidegger, Gadamer argues that when we find ourselves within a situation that we are trying to understand, we can't stand outside it; we have to find ourselves *within* the situation in order to throw some light on it. But this process of illumination can never be completely achieved. Hence, he maintains that understanding is not merely reproductive but a very productive process consisting in finding new meanings generated through the dialogue between speaker/listener or the author/reader (Gadamer, 1975/1989).

Gadamer introduces the concept of *situation*, which refers to a standpoint that limits the possibility of vision and the concept of *horizon*, which refers to the range of vision. Applying these concepts to the thinking mind, he speaks of the narrowness of a horizon, of the possible expansion of a horizon, of the opening up of new horizons, and so forth (Gadamer, 1975/1989; p. 301). For example, "to have a horizon" means not being limited to what is nearby but being able to see beyond it. At the core of his philosophy is the belief that the dialogue between a speaker/listener or a researcher/participant or a text/reader has the potential to generate shared meanings through what he calls the "fusing of horizons." He writes that, "In the process of understanding, a real fusing of horizons occurs" (Gadamer, 1975/1989, p. 306).

For Gadamer, to question is an essential aspect of the interpretive process: "The essence of the question is to open up possibilities and keep them open" (Gadamer, 1975/1989, p.298).

Hermeneutical phenomenology, as created by Heidegger and Gadamer, is essentially an ontological approach because it emphasizes that humankind participates in Being and Being has a structure that is capable of being apprehended and understood. Within this hermeneutic phenomenology paradigm, the researcher has to take on the role of co-learner and must desire to be educated by the people involved in the study, immersing herself in the circular movement of understanding (learning). However, the final aim of this circular movement of understanding is

not to reveal some ultimate meaning or truth of things, but to reach self-understanding through the process of the disclosure of reality which occurs through the discursive exchange between the researcher and her participants.

The Integration of Four Perspectives

Intentional, Cultural, Behavioral, and Social

The work of Lev Vygotsky (1896-1934) a Russian psychologist combines all four perspectives: the individual, cultural, behavioral, and social.

Vygotsky's Theory of Social Development

*“Initially, an emotion is individual, and only by means of a work of art
does it become social or generalized.”*

(Vygotsky, 1971, p. 243)

Through his work, Vygotsky tried to answer the question: How have humans, in their short life trajectory, advanced so far beyond their initial biological endowment and in such diverse directions? (Vygotsky, 1981). He saw that, in order to arrive at an adequate answer, it would be necessary to look at not only *individuals* but also the *social* and material environment with which they interacted in the course of their development. The development of the human being could not be seen as an isolated trajectory, but in relation to historical change on a variety of levels: on the individual level, on the institutional level which concerns family, school, workplaces, etc, and on the wider cultural level in which those institutions are embedded.

Lev Vygotsky wrote broadly on a variety of topics that relate to the understanding of the process of creativity. These topics include the development of higher mental functions, the development of perception and attention, the role of imagination and the connections among emotions, personal experiences, consciousness and creativity. Vygotsky looked at creativity from the individual, social and cultural points of view. He was interested in how creativity influences the individual's development over his lifespan, the role of creativity in cultural development, and how creativity expands both individual and cultural meaning.

Vygotsky believed that human development is a nonlinear, complex and dynamic process “characterized by periodicity, unevenness in the development of different functions, metamorphosis or qualitative transformation of one form into another, intertwining of external and internal factors and adaptive processes...” (Vygotsky, 1978, p.73). He stressed the importance of these “revolutionary changes” in the history of child development and proposed “revolution and evolution as two forms of development that are mutually related and mutually presuppose each other” (Vygotsky, 1978; p.73). Vygotsky viewed humans as active and dynamic participants in their own existence as beings whose actions affect both themselves and their surrounding world.

He envisioned developmental and creative processes in terms of the *internalization* (reorganization or transformation) of external stimuli (cultural tools and social interaction) based on the individual's characteristics and existing knowledge. All mental functions are first experienced on the social level (interaction between people), and later, on the individual level (inside the individual). Internalization is a complex series of developmental events (Vygotsky, 1978, p. 57). Once internalized, these mental functions interact with each other to form more flexible, complex functional systems.

Each individual has the capacity to *externalize* and share with others her understanding of their shared experiences. *Externalization* is the process of the construction and synthesis of emotion-based meanings and cognitive symbols. The tension between these two processes stimulates the growth of the personality and new ideas. Internalization and externalization are interconnected through the loop of dependence. Creativity results in products that are externalized and made available for others at the cultural and social level. Development is based on the materials (cultural, social) available at a particular point in time, and involves the continuous reorganization of complex connections and conflicts arising as a result of the interdependence between the individual and the social world (Figure 5).

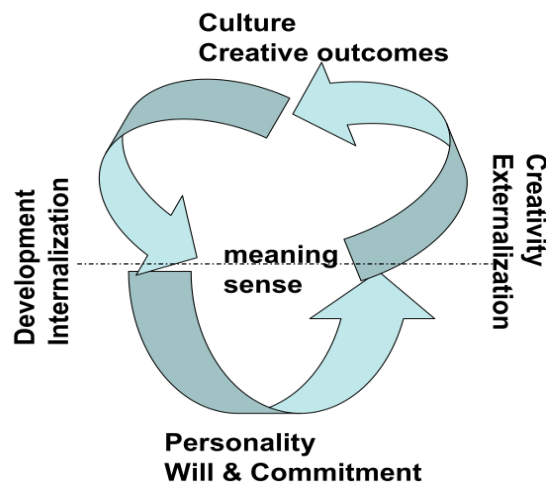


Figure 5 A visual representation of Vygotsky's dialectical condition of the development of creativity

In other words, creativity transforms both the creator (through her personal experience in the creative process), as well as members of the social world (via the creator's shared bits of

knowledge and physical artifacts). Creativity creates a lifelong zone of proximal development, wherein people can continually learn from and contribute to their cultures.

The Integration of Three Perspectives

Intentional, Behavioral, and Dynamic System Theory

Neurophenomenology of Varela and Freeman

Another integral and interdisciplinary approach to the study of human consciousness is neurophenomenology (Varela, Thompson, & Rosh, 1993; Varela, 1992).

Francisco Varela (1946-2001), a Chilean biologist and cognitive neuroscientist, was an active supporter of this interdisciplinary approach to the study of human consciousness. He was a serious practitioner of Tibetan Buddhist meditation and a student of Buddhist psychology and philosophy.

Neurophenomenology combines three different fields:

- i) first-person data from the careful examination of experience with specific first-person methods,
- ii) formal models and analytical tools from the dynamical system theory, grounded in an embodied-enactive approach to cognition, and
- iii) neurophysiological data from the measurement of large-scale, integrative processes of the brain.

Neurophenomenology relies on two key concepts: *emergence* and *embodiment*. Emergence refers to new, unexpected structures and patterns created through the process of self-organization. I explain this concept in the “Complexity Science” section. Emergence properties are fundamental to the operations of the brain, allowing the functionally different regions of the

brain to interconnect into a whole complex system. This integration is essential to the emergence of consciousness (Edelman, 2004).

Embodiment encompasses both the body as a living, experiential structure and the body as the context or milieu of cognitive mechanisms. Varela argued that perception and action are embodied in self-organizing sensory and motor processes, postulating that cognitive structures emerge from recurrent patterns of perceptually guided action (Varela, 1992).

Similarly, Walter Freeman (1995, 2000) proposes that an intention for acting on the world arises from coordination among all sensory and motor cortices. Through the sensory and motor processes, an individual becomes aware of her *emotional state* and her perception of her own state guides and shapes her action. In other words, the emotional state anticipates the intentional action. He writes: “Intentional action begins with the emergent construction with the brain of goals comprising its possible future states, which will require that actions be directed by the brain in order that those futures be realized” (Freeman, 2000, p. 213).

The Lower- Right Quadrant

Interobjective – Complexity Science

To continue the review of the literature, I include a section on complexity science, with particular emphasis on the concept of chaos theory and self-organization.

Everywhere around us we see the emergence of structures that bear witness to the ‘creativity of nature’...I have always felt that this creativity had to be connected in some way to the distance from equilibrium, and was thus an irreversible process.

(Prigogine & Stengers, 1984)

In the second half of the twentieth century, complexity science emerged as a highly interdisciplinary theoretical framework seeking to answer some fundamental questions

about open, complex, and dynamic systems. Common examples of complexity science are chaos theory (Lorenz, 1993, Li & Yorke, 1975; May, 1976), dynamical system theory (Abraham et al., 1990; Thelen & Smith, 1994), autopoiesis & adaptation (Maturana & Varela, 1992), theory of synergetics (Haken, 1984,1987), fractal geometry (Mandelbrot, 1982), catastrophe theory (Thom, 1972/1975; Zeeman, 1977; Arnold, 1986), and the theory of self-organization (Prigogine, 1980; Prigogine & Stengers, 1984; Prigogine, 1997) (Figure 6).

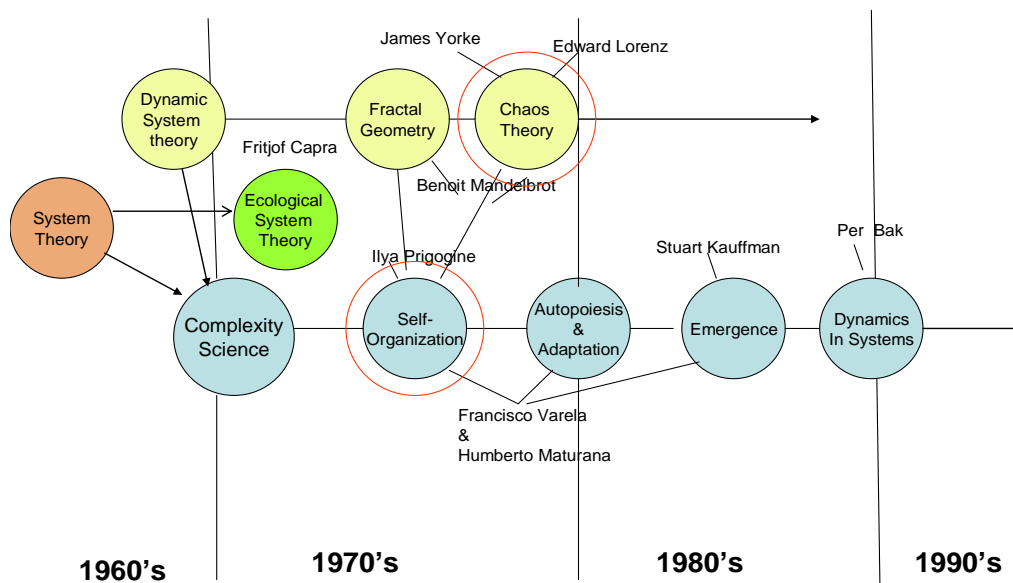


Figure 6 Map of Complexity Science

In this section, I introduce the main concepts and principles of chaos theory and self-organization. These details are necessary for understanding my section on emotion, and for the further interpretation and modelling of the processes of development and creativity of my study participants.

Chaos Theory

Chaos theory studies open, complex, and dynamic systems that constantly interact with and adjust to their environment, changing, growing, learning, and evolving. Chaotic systems exhibit an *extreme sensitivity to their initial conditions*, a phenomenon which has popularly been called the “*butterfly effect*.” Slight differences in the systems’ starting points make a very large difference in their outcomes. Such systems are highly sensitive because they are always on the move, always changing, never precisely reverting to their initial states. One reason that the elements in chaotic dynamical systems are so sensitive to their initial conditions is that these complex systems are subject to *feedback*.

Negative and Positive Feedbacks

In chaotic systems, everything is connected to everything else through *negative* and *positive feedback* (Briggs & Peat, 1990, 1999). Negative feedback keeps things in check and regulates the stability of the system. Positive feedback pushes the system to change, where more leads to more and less to less. Sometimes positive feedback drives a system to explode or spiral out of control. One of the most important discoveries of chaos theory has been that positive feedback can cause complex, even chaotic behavior, to unfold inside of and disrupt orderly systems. Also that negative feedback can grow inside an otherwise chaotic system, suddenly organizing it and making it stable. Chaos theory encourages us to try to understand how change unfolds through circular patterns of interactions (Laycraft, 2009a).

Bifurcation

Systems that change radically as a result of feedback are said to be *nonlinear*. In some conditions nonlinear systems behave in a regular, cyclical manner until something sets them off: a critical

point is passed, and suddenly they go chaotic. This critical point where a system changes the character of its motion is called a *phase transition* or a *bifurcation point*.

At this point, system orderliness breaks down, sensitivity to perturbation increases, and new patterns of organization rapidly self-amplify (Kelso, 1995; Prigogine & Stengers, 1984). Preceding a bifurcation point, a system can be well behaved. But as a bifurcation is approached, the system's trajectory becomes random and unpredictable, and large fluctuations occur. At this point, the system "hesitates" between various different directions of change. Even little fluctuations in the subsystem can combine through a positive feedback loop, becoming strong enough to shatter any preexisting organization. At this point, the disorganized system either disintegrates into chaos or leaps to a new, higher-order of organization. In the latter situation, order arises spontaneously, through self-organization (Prigogine & Stengers, 1984; Nicolis & Prigogine, 1989).

When we think of ourselves as nonlinear, dynamic systems, bifurcation points can be viewed as special events along the flow of our lives during which we can make choices to influence our future possibilities.

Psychological bifurcations are the rapid transformations of sensory, perceptual, cognitive, and affective experiences that may radically alter our lifestyles. They appear in the process of learning, in creativity, in brain activity, and in developmental stages (Abraham, 1995). Here are some examples of psychological bifurcation points: (a) "Aha!" moments, or insight experiences, when a rapid perceptual or cognitive restructuring takes place in the context of working on a difficult problem; (b) moments when we experience overwhelming emotional transformations (e.g., falling in love); (c) the moment when "of body" information rises to our attention (e.g., feeling of hunger) (Gilgen, 1995).

Attractors

The complex states of motion are called *attractors*. They are useful in characterizing the behavior of a system. The same system can be characterized by different types of attractors at different times in its development.

There are three types of attractors: (a) the point attractor, (b) the periodic attractor, and (c) the strange or chaotic attractor (Figure 7).

The point attractor (Abraham & Shaw, 1984; Briggs & Peat, 1990; Gleick, 1988; Kelso, 1995) is the most predictable, especially when the system moves toward it in a condition of asymptotic stability. An example of the point attractor from life dynamics is a fixation such as one's desire for or addiction to drugs, alcohol, sex, or an idea of some kind. It leads to monotony, to misery, to depression, and often to death. It is a single-minded attractor: black or white, good or bad, hate or love.

To the group of *periodic attractors* belong the *cycle attractor* and the *torus attractor* (Abraham & Shaw, 1984; Briggs & Peat, 1990; Gleick, 1988; Kelso, 1995). The main characteristic of the cycle attractor is the ability to resist change. Both the point attractor and the cycle attractors describe systems that are highly regular and thus predictable. Routine is the perfect life example for the cycle attractor; when we are attracted to two activities, we tend to oscillate between them (e.g., work and family). Another example is our egocentric desires to acquire wealth, power, fame, and have pleasure of one sort or another. This state of life where we are moving from one situation to another, fluctuating from one mood to another and repeating the very same process again and again, brings only dissatisfaction and suffering (Laycraft, 2009a).

The three-dimensional attractor is the *torus attractor* (Abraham & Shaw, 1984; Briggs & Peat, 1990). It is a complex cycle that moves forward and is different even while repeating itself. The torus attractor has a higher degree of regularity and complexity than the cycle attractor, but its pattern is fixed and finite. An example of the torus attractor is a complex set of attractive events that occur to a person on many levels over the course of a year. Then these events repeat again, year in and year out.

The *strange* or *chaotic attractor* (Gleick, 1988; Kelso, 1995; Lorenz, 1993) describes systems that are in a state of turbulence, such as the weather, a violent river, brain activity, or one's life dynamics. In general, chaotic attractors can take an infinite number of different forms. Their patterns are fantastic, complex maps that capture the interplay between stability and change in a system. For example, the chaotic attractor portrays our state of consciousness as a combination of feelings, thoughts, memories, and images. These mental components are constantly changing: memories come and go, thoughts pass through the mind only to disappear and return again later in different forms, and so on. Consciousness exhibits periods of calm, periods of more-or-less regular oscillations, and periods of chaotic activities. A system's ability to move in and out of chaos gives it a creative advantage.

Essentially, a chaotic attractor is a process that unfolds through the complex interactions between elements in a system. It is through a pattern of folding and stretching that the structure of the chaotic attractor emerges. Chaotic attractors are the foundation for the hidden order in natural systems.

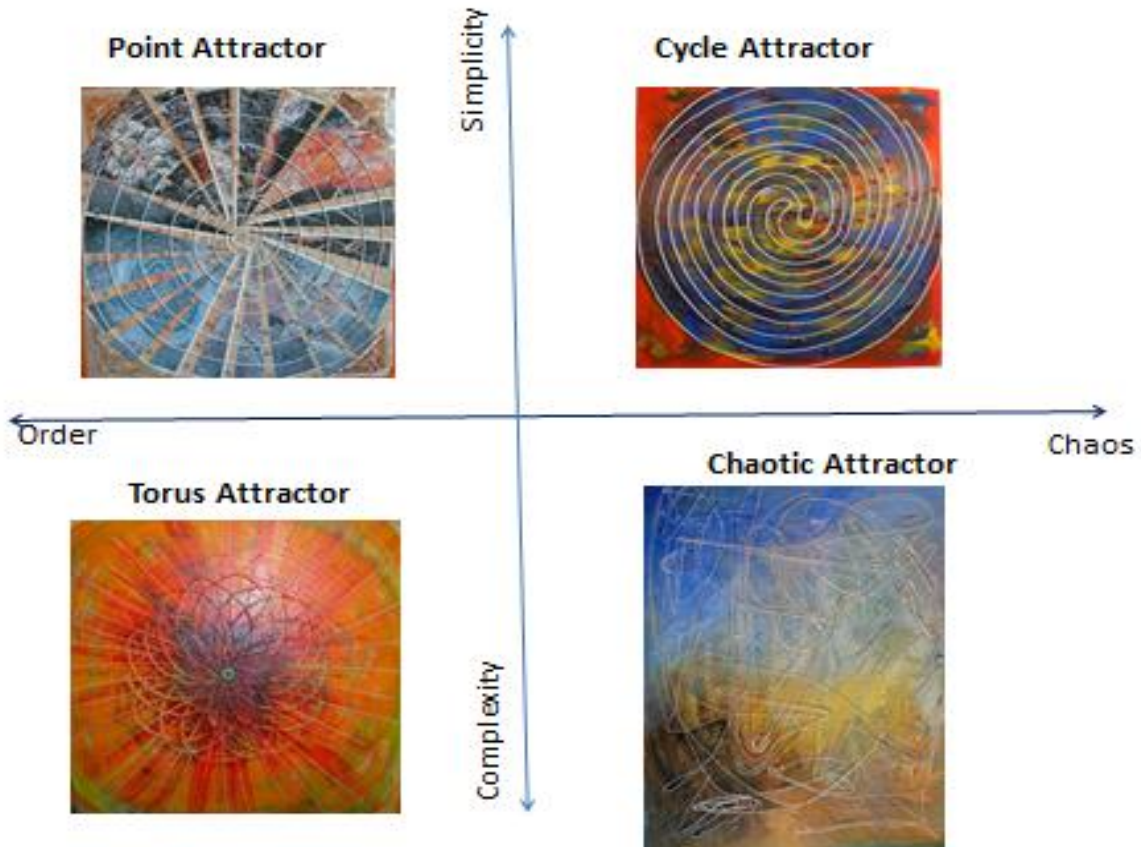


Figure 7 Attractors

Self-Organization

Self-organization is not a single theory or a conceptual model; it is rather an idea that explains the process of the spontaneous emergence of new patterns, changes, and novelties in a variety of systems, whether physical, chemical, or biological. Recently, principles of self-organizing dynamic systems have been introduced to psychology, especially developmental psychology, and have proved influential in the study of emotional development, the relationship between cognition and emotion, and personality development (Maturana & Varela, 1992; Thelen & Smith, 1994; Lewis, 1997, 2000a, 2000b, 2005a, 2005b; Lewis & Granic, 1999; Izard et al., 2000).

Self-organization is nature's way of handling complexity in open systems which contain a large number of multiple, often heterogeneous elements interacting nonlinearly with each other and their surrounding environment (Kelso & Engstrom, 2006, p. 112). New states emerge spontaneously purely as a function of the inner dynamics of nonlinear interactions between the system's components. The control parameter (e.g., temperature, pressure) creates the necessary conditions for far-from-equilibrium states and critical fluctuations. Near-equilibrium fluctuations are harmless, but far-from-equilibrium ones play a central role (Prigogine, 1997). Fluctuations are continuously probing the system and providing opportunities for the emergence of new patterns (Kelso, 1995). When the system is in a far-from-equilibrium state, the rapid flow of energy links its components into more ordered patterns. The emerging patterns in turn influence the behavior of the components of the system. This is called a *circular causality* (Haken, 1987). As a result of this process, all individual coordinating components of the system no longer behave independently, but appear to be drawn into an orderly spatial-temporal pattern (Kelso & Engstrom, 2006) (Figure 8). As a result of this process, the system generates something new: unexpected structures, patterns, and properties known as *emergence* (Bertuglia & Vaio, 2005). Emergence is a general principle that can be applied to understanding change and novelty in all natural systems (Lewis, 2000a).

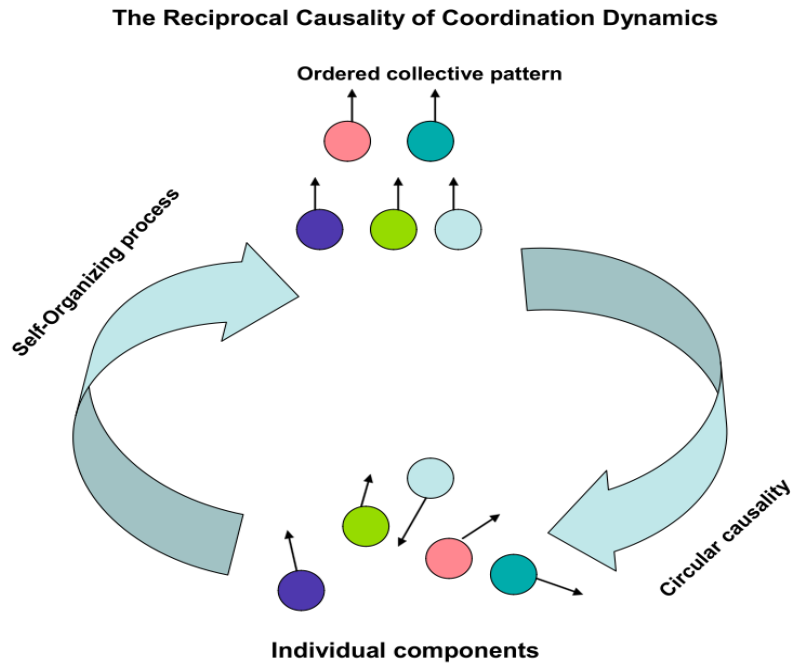


Figure 8 The reciprocal causality of coordination dynamics

Ilya Prigogine introduced the concept of *dissipative structures* (Prigogine, 1980, 1997; Prigogine and Stengers, 1984). Such structures, to maintain their existence, must interact with their environment continually, maintaining the flow of energy into and out of the system (Figure 9). Prigogine and Stengers write: “at equilibrium molecules behave as essentially independent entities; they ignore one another. However, non-equilibrium wakes them up and introduces a coherence quite foreign to equilibrium. This is the concept of “order through fluctuations” (Prigogine and Stengers, 1984).

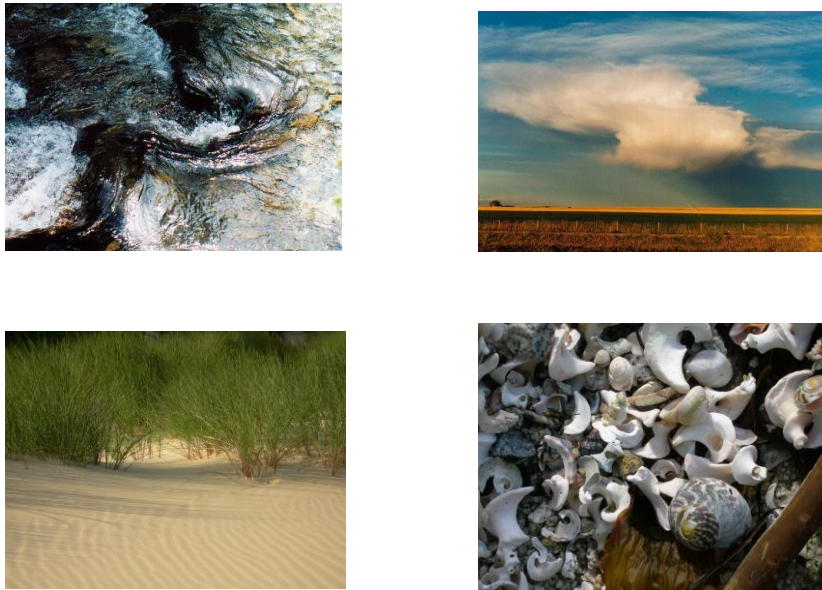


Figure 9 Examples of dissipative structures in nature

Self-organizing systems become more ordered and more complex over time. Complexity can be characterized by two dimensions: *differentiation* and *integration*. Differentiation refers to a variety of different components behaving in different ways. Integration defines the links between the components of the system and leads to order. Complexity arises when both of these aspects are present. It can be said that complexity is situated between order and disorder, when the system finds itself at the “edge of chaos”

At this state the system is displaying intelligent behavior in adapting to environmental stimuli. A complex system is capable of change, adaptation, and growth (Bertuglia & Vaio, 2005).

The human brain is an example of a complex adaptive system in which single neurons interact in simple ways while their collective neural network produces highly complex properties such as creativity and consciousness. Creativity and consciousness are examples of emergence. The interaction of the processes that form a complex system such as the mind (thoughts, feelings,

images, memories, and so on) give rise to new processes. These new processes now interact with the original ones to create yet other novel processes—second-order emergent events—and these are in principle entirely free and unpredictable.

CHAPTER THREE:

IN DEPTH EXAMINATION OF THEORIES ON EMOTIONS

Emotions - Definitions

In this chapter, I present competing definitions of emotional processes, and discuss four theories of the intrapersonal processes of emotions based on self-organization.

Antonio Damasio, one of the world's leading neurologists, in the introduction to his book *Descartes' Error*, writes:

Feelings are the sensors for the match and lack thereof between nature and circumstance...They serve as internal guides, and they help us communicate to others signals that can also guide them...Feelings let us catch a glimpse of the organism in full biological swing, a reflection of the mechanisms of life itself as they go about their business. Were it not for the possibility of sensing body states that are inherently ordained to be painful or pleasurable, there would be no suffering or bliss, no longing or mercy, no tragedy or glory in the human condition. (Damasio, 1994, p.xix)

This citation expresses a complexity of emotions that can be defined from a variety of perspectives. I have chosen a number of definitions of emotions, and placed them on Wilber's quadrants (Figure 10).

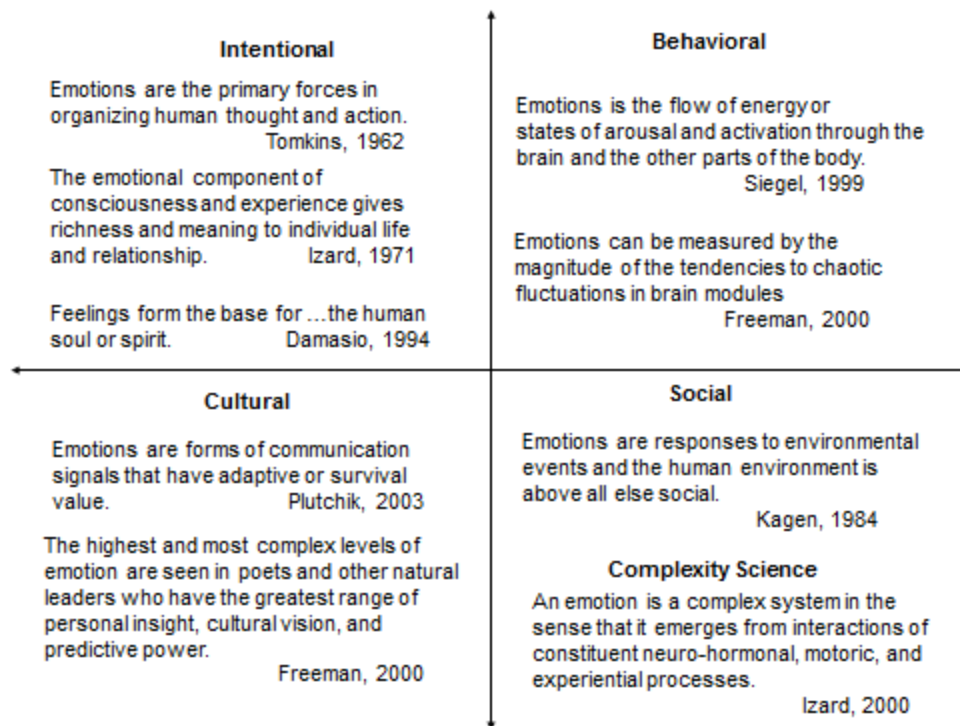


Figure 10 Definitions of emotions on Wilber's quadrants

Emotions are dynamic and complex processes of change, and play an important role in human development and individual responses to environmental challenges. They are important factors in motivating perception, thought, and action (Frijda, 1986). For this reason Dabrowski (1973, 1996; Dabrowski et al., 1970) introduced the concept of developmental dynamisms as instinctual-emotional-cognitive forces which fuel and shape human development.

The concept of developmental dynamisms is similar to Plutchik's (1962, 1980, 1994, 2003) and TenHouten's (2007) *secondary* and *tertiary emotions*, Izard's (1977, 1984, 2000) *affective-cognitive structures*, and Lewis' (1997, 2000 a, 2000 b) *emotional interpretations*. These dynamisms are structures that emerge out of the self-organized coupling of the emotional and cognitive systems. They provide a variety of alternatives and an increased capacity to deal with complex and challenging problems.

In brief, emotions are the core of being human and are closely intertwined with our thoughts, experiences, and behavior. They generate our energy and ability to make changes in the internal and external world.

The Psycho-Evolutionary Theory of Emotions

I begin my review of these theories with American psychologist Robert Plutchik's psycho-evolutionary theory of emotion (Plutchik, 1962, 1980, 1994, 2003). The basis for his theory is a generally Darwinian position that treats emotions as adaptive reactions to the basic problems of life. But Plutchik (1980) goes beyond Darwin's idea by specifying these life problems and by introducing the concept that primary emotions must come in pairs of opposites: one for adapting to a positive situation (an opportunity), and one for a negative, problematic situation (an obstacle).

Plutchik proposes that there are exactly four problems in life: *identity*, *temporality*, *hierarchy*, and *territoriality* (Figure 11).

Identity concerns membership in social groups and is a problem concerning two opposite primary emotions, *acceptance* (taking in) and *rejection* (expelling).

Temporality leads to the development of social institutions such as the family, friendship, social communities, and others. Plutchik introduces *happiness / joy* and *sadness* as adaptive emotions to the positive and negative experiences of temporality.

Hierarchy is a broad concept whose meaning includes power, influence, authority, and prestige. *Anger* and *fear* are the adaptive reactions to the positive and negative experiences of hierarchy.

Territoriality is also a universal problem of life. Territory requires exploration and an ability to plan, monitor, expect, and anticipate. Opposed to the behavior of opening territory through exploration is *orientation*, with its implied surprise and loss of control. The most generic subjective terms for these two emotions are *anticipation* and *surprise*.

The central idea of Plutchik's theory is that emotions have a purpose in the lives of individuals.

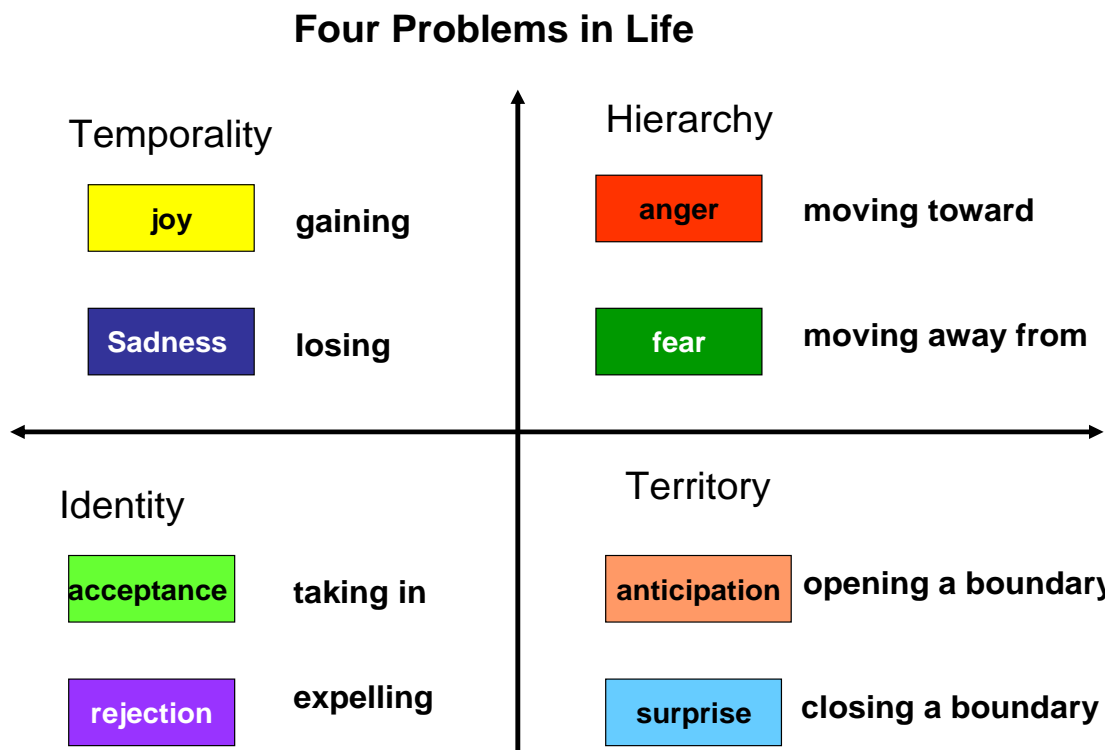


Figure 11 Plutchik's model of the primary emotions

The psycho-evolutionary theory consists of three interrelated models: the *structural*, the *sequential*, and the *derivative* models (Plutchik, 1980, 2003).

The Structural Model

The structural model represents three characteristics of emotions such as *intensity*, *similarity*, and *polarity*. The model expresses these characteristics by a cone (see Figure 12). The vertical

dimension represents intensity of emotion, any cross-sectional circle represents similarity of emotions, and bipolarity is reflected by opposite points on the circle (Plutchik, 1980, 2003). The eight slices of this three-dimensional structure represent the eight primary emotions: the four positive emotions (acceptance, joy, anger, and anticipation) together with their opposing negative emotions (disgust, sadness, fear, and surprise).

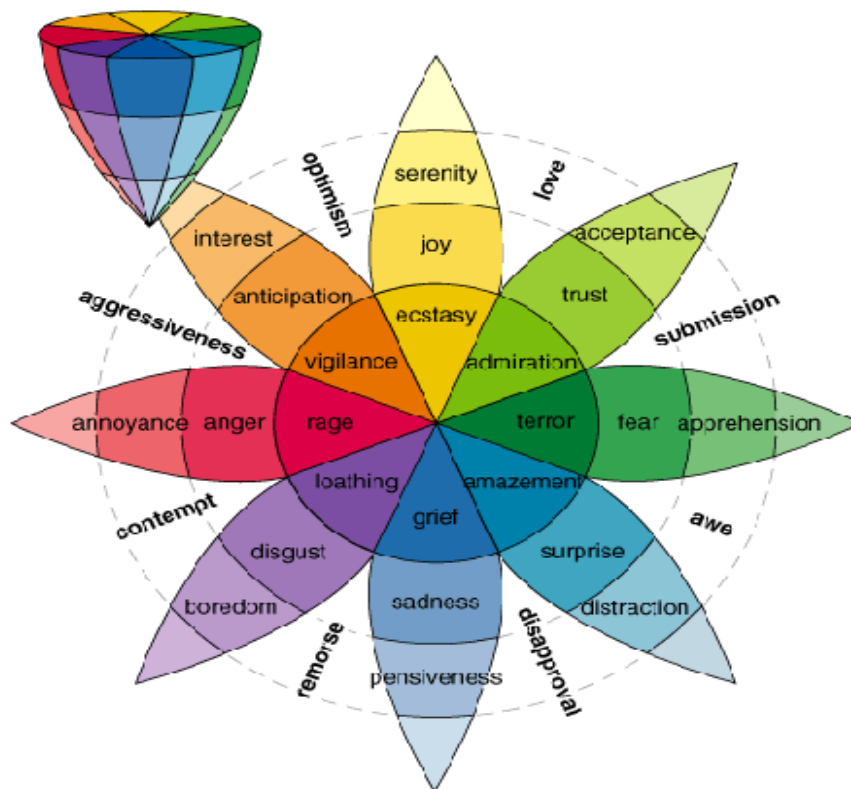


Figure 12 The color-cone of emotions of Plutchik's theory

The Sequential Model

Plutchik (2003) points out that the sequence of events in emotion is still an unsolved problem. It is not clear whether the feeling of emotion comes first or the correlated physiological changes. A major reason for this uncertainty is the fact that emotions are feedback processes. Plutchik's

sequential model assumes that stimulus events, either external or internal, act as the primary trigger of the emotion process. However, events need to be interpreted (cognition) in order for them to have an effect on the individual. Then, following the cognition or interpretation, a feeling state occurs as well as a physiological state of arousal. The arousal states are generally preparations for action. Feeling states also tend to be followed by impulses for action. When action occurs, the individual runs, cries, criticizes, laughs, and so on. Such overt behavior is not the end of the emotion process; such behavior generally has an effect on the stimulus or condition that started the chain of events in the first place. Feedback loops, as is shown in Figure 13, may influence the impulses of action, the feeling state, the cognition, as well as the initiating stimulus. This process leads to the idea that feelings and behaviors can affect cognition, just as much as cognition can influence feelings. (Plutchik, 2003, p.107).

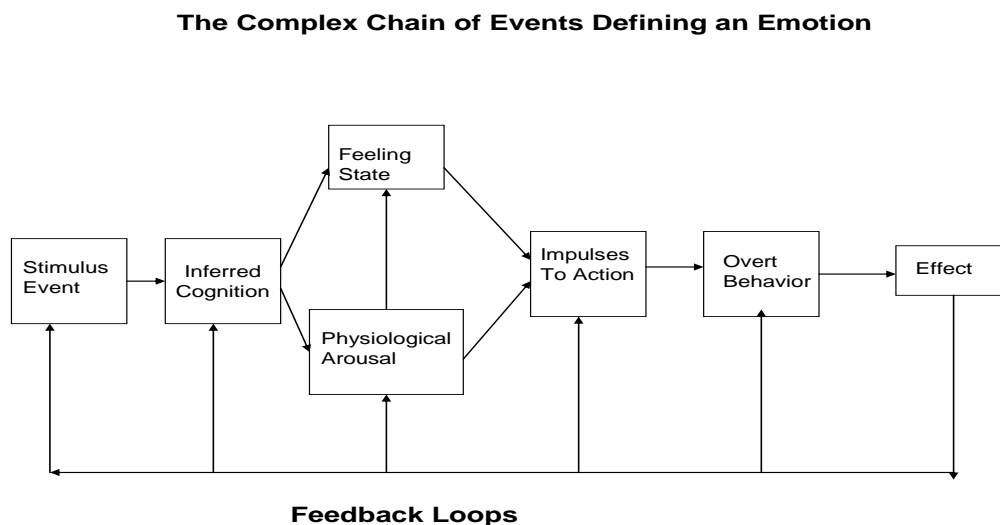


Figure 13 The complex chain of events defining an emotion

Using Plutchik's model of the process of emotion, I can analyze my latest experience of joy. The great news of the birth of my grandson was a stimulus event that triggered the emotional process of joy. I understood it quickly (inferred cognition) and started to feel enormous excitement, and delight (feeling state) that flowed through my whole body (a strong physical arousal). This gave me the impulse to share this great news with my family, to jump with excitement, and finally to think about how to get to my daughter to see her and her baby. I shared the news with my family, we drove to the hospital (I had too much excitement to drive), and finally we got there and saw my daughter and grandson. My excitement changed to feelings of love (acceptance & joy) for the new baby, and satisfaction (surprise & joy). I started to calm down and the news I got earlier was no longer a surprise. The process ended with the complete acceptance of and love for my new grandson.

Summarizing this analysis of the process of "JOY", I found that besides the primary emotion of joy, I experienced mainly secondary emotions starting with delight, which is a combination of joy and surprise. After seeing the baby, I felt satisfaction and love for this boy, a combination of acceptance (of him) and joy.

The Complex Chain of Events Defining “JOY”

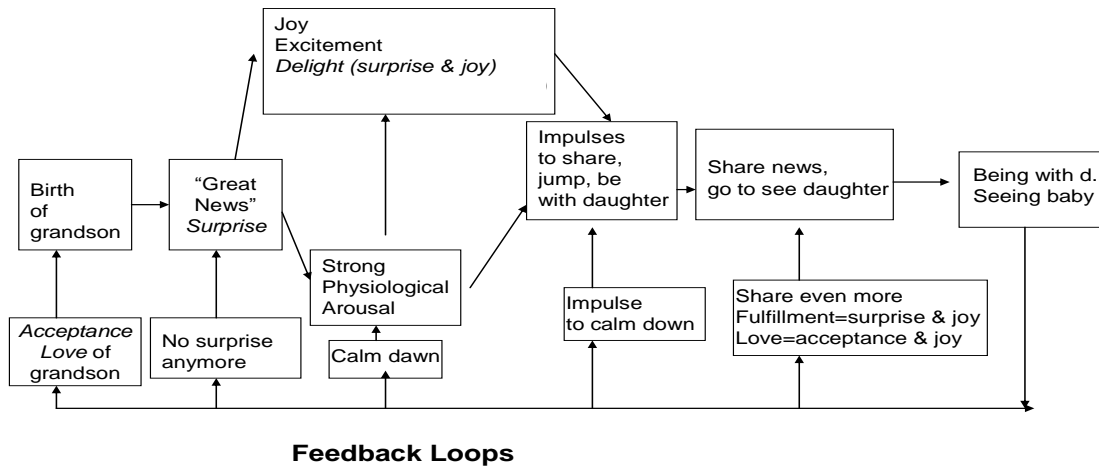


Figure 14 The complex chain of events defining “Joy”

The Derivative Model

In his theory, Plutchik also introduces the idea of a *derivate*, meaning that certain more complex structures are derived from other, more simple concepts. He proposes that beyond the eight primary emotions, all other emotions are derivative states occurring as a combination of the primary emotions. In some circumstances the primary emotion is activated and usually recruits other emotions (I show this process in my analysis of joy). If two primary emotions are joined, the result is a secondary emotion; if three, a tertiary emotion and so on. Similar to color theory, the combining of these primary emotions at different intensities produces a variety of different emotions. They form emotional patterns that stabilize over repetitions and time and describe personality traits.

The Affect-Spectrum Theory

TenHouten's affect-spectrum theory (2007) is an extension and revision of Plutchik's theory. TenHouten's main goal was to introduce sociological content to Plutchik's psycho-evolutionary theory, assuming that emotions are responses to environmental events and that the human environment is above all else social.

The affect-spectrum theory revises a classification of secondary emotions and includes the definition of 17 tertiary emotions. Plutchik (1962, 1980) defined 24 secondary emotions without considering the four emotions that combine the pairs of opposite primary emotions. By using a combination formula $(n!/k!(n-k)!)$, there should be 28 secondary emotions $(8!/2!6!)$ (Figure 16) and 56 tertiary emotions $(8!/3!5!)$. But TenHouten feels that his theory is not yet complete, because only 17 tertiary emotions (Figure 17) have as yet been defined, and he encourages other researchers to become involved in the study of emotions from a social perspective.

His empirical approach proves that eight social relationships are developed from eight primary emotions, and agrees with Plutchik's idea that the eight primary emotions are the prototypical adaptive reactions to life's problems. TenHouten hopes that his approach can produce the entire spectrum of complex emotions.

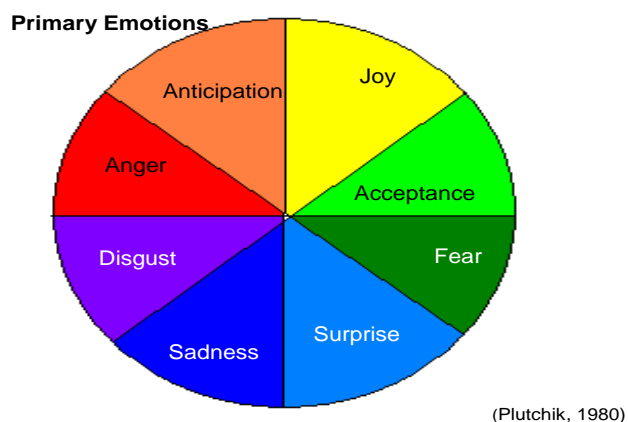


Figure 15 The color-circle of primary emotions

A classification of the 28 secondary emotions

Primary dyads (mixture of two adjacent emotions)

Love, Friendliness*	joy	acceptance
Misery, Loneliness	sadness	disgust
Optimism, Courage*	anticipation	joy
Disappointment*	surprise	sadness
Aggressiveness*	anger	anticipation
Alarm, Awe	fear	surprise
Submissiveness	acceptance	fear
Contempt, Hate	disgust	anger

Secondary dyads (mixture of two emotions, once removed)

Guilt	joy	fear
Sullenness, Envy	sadness	anger
Curiosity*	acceptance	surprise
Cynicism	disgust	anticipation
Shock	surprise	disgust
Resourcefulness*	anticipation	acceptance
Embarrassment	fear	sadness
Pride*	anger	joy

Tertiary dyads (mixture of two emotions, twice removed)

Delight*	joy	surprise
Pessimism	sadness	anticipation
Resignation	acceptance	sadness
Morbidness	disgust	joy
Outrage	surprise	anger
Anxiety*	anticipation	fear
Repugnance	fear	disgust
Dominance	anger	acceptance

Quaternary dyads

Catharsis	joy	sadness
Ambivalence	acceptance	disgust
Frozenness	fear	anger
Confusion	anticipation	surprise

Figure 16 A classification of the 28 secondary emotions

Tertiary Emotions

Ambition*	anticipation	anger	joy
Confidence*	anticipation	acceptance	anger
Pridefulness*	anger	joy	acceptance
Sanguiness*	anticipation	joy	acceptance
Vengefulness	anger	anticipation	sadness
Sadism(1)	anger	disgust	anticipation
Sadism (2)	anger	sadness	disgust
Misanthropy	anticipation	sadness	disgust
Seductiveness*	joy	acceptance	surprise

Tertiary Emotions

Bullying	fear	surprise	acceptance
Intimidation	fear	surprise	joy
Domineering	fear	acceptance	joy
Jealously	surprise	fear	sadness
Revolting	surprise	fear	disgust
Shamefulness	fear	sadness	disgust
Repulsiveness	anticipation	sadness	disgust
Envy	surprise	anger	sadness

Figure 17 A classification of the 17 tertiary emotions

The Differential Emotions Theory

The differential emotions theory (DET) (Izard, 1977, 1984; Izard et al., 2000) claims that emotions are the main forces in the organization of human thoughts and actions, and give richness and meaning to individual life and relationships. According to this theory, a small set of emotions are the basis of human motivation, and constitute independent emotion systems. Emotion systems are highly sensitive to changes in the internal and external environment. A concrete situation activates a discrete emotion that organizes and motivates behavior. Then, the activated emotion, depending on the context of its situation, recruits another emotion.

For example, an unexpected or unknown event triggers in us the emotion of surprise. This begins with sudden attention or interest. When surprise joins with joy, it creates the secondary emotion delight, and when surprise joins sadness, it creates disappointment (Plutchik, 1980).

These emotions self-organize into a coherent pattern of interacting emotions, unique to the individual and her situations. These patterns of multiple emotions give the individual an enormous advantage when confronting complex situations.

For example, when we desire to investigate or learn something completely new, we are curious about this new thing. Curiosity includes a component of surprise and a desire to assimilate new information, referred as acceptance. Thus, curiosity opens us up to new experiences, and challenges us to solve unexpected, complex problems. The curious person finds excitement and pleasure in the contemplation of an ambiguous situation and in her ability to identify a problem (Russ, 1999). Thus, curiosity is the motivating system that is essential to creativity.

An emotion or a pattern of emotions attracts an image or thought to form a complex system called an *affective-cognitive structure* (Izard, 1977, 1984; Izard et al., 2000). The information in the conscious component of emotion becomes a key to understanding the relation between emotion and cognition. Emotion guides the perceptual and cognitive processes.

In our example, curiosity (the pattern of surprise and acceptance) can link with interest/exploration. Interest is evoked by the perception of novelty either outside of one's self or from within (imaging, memory). We become engaged, caught-up, and fascinated. We want to investigate, to explore, and to be involved in intellectual or artistic pursuits. Interest/exploration plays an important role in holding our attention and in maintaining our focal awareness (Izard, 1977). Interest/anticipation combined with acceptance generates resourcefulness, which concerns the excitement of mental discernment, one's aptitude for invention or discovery, and, more generally, mental penetration and shrewdness (Oxford, 1971). Resourcefulness has a substantial cognitive component as it involves thoughtfulness in efforts to overcome obstacles in

the pursuit of goals. It is also important in the management of both stress and anxiety (Zauszniewski et al., 2002).

Multiple occurrences of an emotion-thought sequence may lead to the stabilization of an affective-cognitive structure. Then, this affective-cognitive structure attracts similar structures, forming a complex system expressing the traits of personality.

In our example, the resourceful individual becomes a confident person, prepared to carry out action intended to realize her goals. The confident person is a person with a highly positive self-image and a strong positive identity.

The Differential Emotions Theory

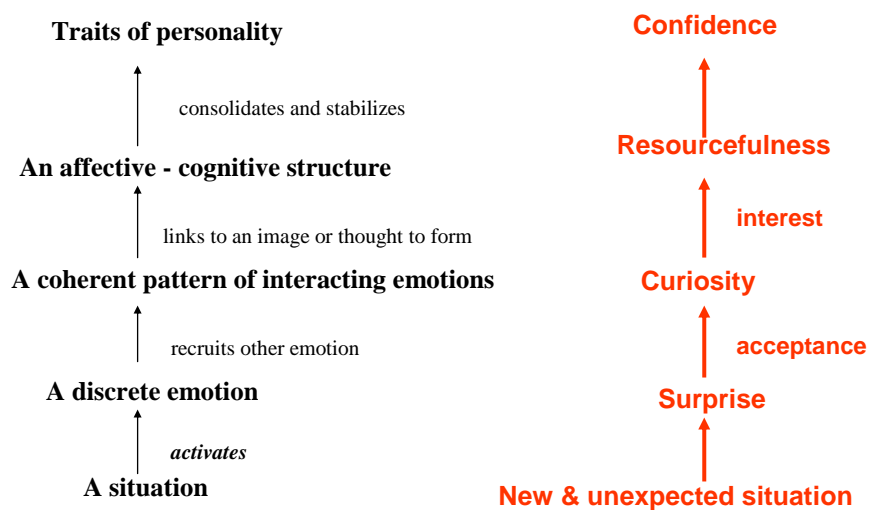


Figure 18 The differential emotions theory

Izard's theory of affective-cognitive structures is similar to Lewis' concept of emotional interpretations (Lewis, 1997, 2000 a & b, Lewis & Granic, 1999; Lewis & Ferrari, 2001). Both constructs describe structures that emerge out of the self-organizing coupling elements of the emotional and cognitive systems.

Self-Organizing Emotional Interpretations

It is still not clear whether emotion precedes cognition, or the reverse. Neurobiological studies have shone a new light on this problem. LeDoux's (1996) studies of pathways between the thalamus and the amygdala show the emergence of emotional response based on sensory information. In this case, emotion is triggered before the perception of the event is complete. Contemporary brain research proves that organized mental activity is always co-emergent and always globally distributed across conceptual, emotional, and perceptual subsystems (Freeman, 1995, 2000; Damasio, 1994).

In this section, I briefly review Marc D. Lewis' psychological model of emotional processes (Lewis, 1997, 2000 a & b, Lewis & Granic, 1999; Lewis & Ferrari, 2001). In this model, the interacting elements that give rise to a global appraisal-emotion complex are called *emotional interpretation* (EI).

An emotion is triggered by any change in perception, cognition, action, or another emotion. This emotion shifts towards a concrete state (e.g. surprise with attention to a new and unexpected thought). Appraisal of this new state does not precede the emerging emotion. Rather, it self-organizes as emotional and cognitive changes regarding the new situation. The appraisal and emotional components interact with each other in positive and negative feedback loops, creating a stable and coherent psychological state. The evolution of EI begins with a trigger phase that is defined by a change in the dynamics of the psychological system. This is a bifurcation point, or a point of transition, characterized by a sudden change of the state of the system. Cognitive and emotional states must act as control parameters that adjust an individual's sensitivities toward what she deems meaningful. Positive feedback recruits new psychological components in response to a perturbing event.

For example, an EI might be triggered by an amazing, breathtaking sunset. An artist, sensitive to these events, begins to feel excitement, amazement, or awe because of the exceptional beauty of this phenomenon.

Next, appraisal and emotion elements may interact in positive feedback loops. They activate and increase perceptual, emotional, and attentional processes that amplify one another. This is the *self-amplification phase*. During this phase, cognitive activities are increasingly focused on emotional-relevant signs.

In our example, the artist may focus on the changing light and color of the sunset and debate whether it would be better to run for the camera or to concentrate on observing this phenomenon and try to remember its features, the colors and forms of a fading away event.

When negative feedback overtakes the psychological system, changes decrease, and stability appears. Appraisal and emotional elements link to each other to form a coherent whole. This is the *self-stabilizing phase*. Negative feedback consolidates relations among thoughts and images, goals and plans, feelings and intentions, and so on.

In our example, the artist's hesitation (whether or not to get the camera) changes into making a plan: she decides to concentrate on the observation of the sunset and to paint after the event ends.

From a developmental perspective, recurrent emotional-interpretive episodes contribute to the formation of individual characteristics (Lewis, 1997). The stabilizing phase of an EI is the necessary condition for the process of learning and creativity. During this phase, when the elements of cognition and emotion combine with each other, the interpretations, action plans, and expectations are emerging.

In our case, the recurrent episodes of concentration on and observation of natural phenomena can contribute to the formation of diligent, attentive, and thoughtful characteristics in the individual.

Self-Organizing Emotional Interpretations

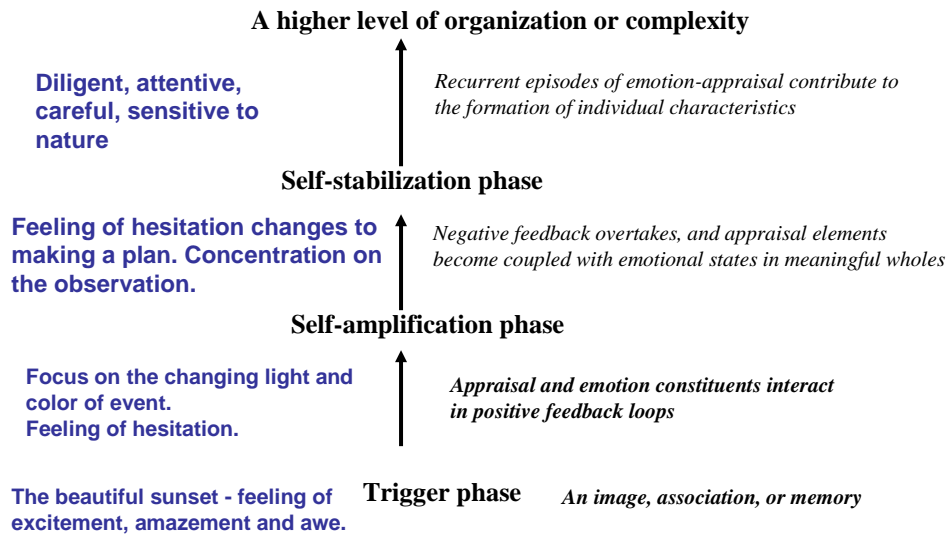


Figure 19 Self-organizing emotional interpretations

Comparison of Plutchik's Theory with the DET and EI Theories

Finally, I compare these three theories using the example of the process of joy I discussed in the section on Plutchik's theory. I include here short interpretations of the same emotional event through the DET and EI approaches.

Interpretation applying the DET

The news about the birth of my grandson activates a discrete emotion, *surprise*, which then recruits other emotions. In this case, because of the happy news, surprise recruits *joy*, creating *delight* and *acceptance* (of this news), which creates *curiosity*. These emotions self-organize into a coherent pattern of interacting emotions, unique to this concrete situation. These three emotions—surprise, joy, and acceptance—create a tertiary emotion that can be called *temptation* or *attraction*, which pushes me to action: the tertiary emotion drives me to see my daughter and her baby.

Interpretation applying EI concepts

Before getting news about the birth of my grandson, I was in a state of waiting, and imagining different scenarios of what was going on with my daughter in the hospital. Then her phone call completely changed my mental and emotional state. This was a *bifurcation point*, where my state shifted to a state of *surprise*. Then through *loops of positive feedback*, the emotion of surprise recruited other emotions, such as *joy* and *acceptance*. These mental components amplified by one another created a state of *delight*, *curiosity* and *excitement*.

Next a *negative feedback* began overtaking my state, and some stability started to emerge, allowing me to make a plan of how to see her and her baby.

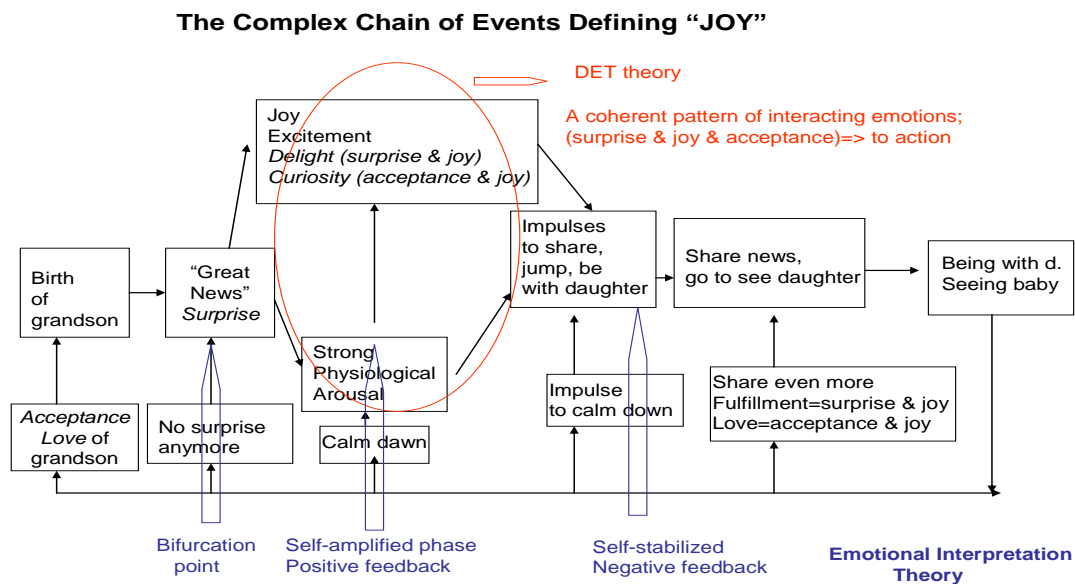


Figure 20 The events of “Joy” including interpretations of DET and EI

We can see some differences between these three theories: the DET and EI approaches concentrate more on the detailed analysis of emotional-cognitive states, including feedback loops, on a smaller scale between emotions and emotional and cognitive components. Plutchik’s model, on the other hand, accounts for the whole mental process, including overt behaviors and their effects, and feedback loops on a larger scale between the phases of the process.

In the next two chapters, I present Dabrowski’s theory of positive disintegration through the prism of complexity science, especially self-organization, with application of the affect-spectrum theory.

CHAPTER FOUR:

IN DEPTH EXAMINATION OF THE THEORY OF POSITIVE DISINTEGRATION

Introduction

The theory of positive disintegration (TPD) describes patterns and explains mechanisms of human development, with a great emphasis on *emotional development*. Kazimierz Dabrowski (1902 -1980), a Polish psychiatrist and psychologist, developed this theory over a lifetime of clinical and academic work (Dabrowski, 1964, 1967, 1972, 1973, 1976, 1996; Dabrowski, Kawczak, & Piechowski, 1970; Dabrowski & Piechowski, 1977a, 1977b). Over the past thirty years, TPD has been successfully applied to the field of gifted education and the study of gifted development (Ackerman, 1997, 2009; Mendaglio & Tillier, 2006; Mroz, 2009; Piechowski, 1979, 1986; Pyryt, 2008; Silverman, 1993, 2008; Silverman & Ellsworth, 1981). Thanks to William Tiller, a graduate student of Dabrowski, the tenets of TPD are easily accessible through a website dedicated to the theory (Tillier, 2008). The website contains an archive of Dabrowski's original works as well as publications by others. However, despite such attempts to promote the theory, TPD is still relatively unknown as a theory of human development.

TPD emphasizes the role of emotions in human development. Dabrowski's ideas converge with contemporary theories of personality development based on the concept of self-organization (Izard, 1984; Izard et al., 2000; Lewis, 1997, 2000; Lewis & Granic, 1999). The main difference between Dabrowski's theory and other developmental theories (Freud, Rogers, Maslow, & Piaget) is how it sees the role of psychoneuroses in the process of human development. The majority of developmental theories represent the traditional view that neuroses and psychoneuroses impede human growth and must be eliminated. Dabrowski's view is completely different. He stresses the importance of "emotional turbulence" in the process of transition from

the lower to the higher levels of mental life, which complies with the idea of dynamic systems theory where chaos (variability, instability, unpredictability) is an inherent part of development (Kelso et al., 1993; Thelen, 1992).

This is why Dabrowski's theory introduces an essential change in adults' attitudes toward creative and gifted young people. It leads to a positive understanding of their inner psychological conflicts and eliminates the negative belief that they require medical treatment. Creative and gifted people display symptoms of increased psychic excitability, nervousness, and psychoneuroses. On the one hand, increased psychic excitability is one of the basic causes of inner tension and conflicts within oneself and one's environment. On the other hand, this increased excitability creates a condition for a broader, deeper, and more complex pattern of experiences. Nervousness and psychoneurotic symptoms are necessary forms of human growth and are signs of the beginning of an advancing process of positive transformations (Dabrowski, 1972, 1996; Dabrowski et al., 1970).

Dabrowski writes:

Such conflict is a necessary prelude to the gradual process of adaption to new external and internal conditions. This results in a disequilibrium, which allows the emergence and organization of new levels of control, higher than those of previous stable period. (Dabrowski, 1996, p. 11)

This idea corresponds to Prigogine's concept that "non-equilibrium is a source of order" (Prigogine & Stengers, 1984).

Parents and educators need to know these signs and should create conditions in which gifted children and adolescents are less susceptible to "unnecessary tension operating on lower levels" (Dabrowski, 1972, p. 219) by activating the process of development to the more complex, richer

and higher levels. The process of complex growth helps young people take their development into their own hands. There is much less tension and mental disorder on the higher levels, where better conditions are formed which give rise to protection and prophylaxis against serious mental disorder or suicide (Dabrowski, 1972).

The lower level of functioning must break down (“disintegrate”) before it is replaced by a new organization of a higher level. The positive disintegration is then a twofold process: (i) reorganization of the lower level of functioning of a mental structure and (ii) construction of a new higher level of organization. In other words, *development is a function of reorganization of mental structure*. Multilevel development consists not only in quantitative growth and the replacement of some elements with others, but acquires new insights and new qualities which lead individuals to self-organize and develop autonomous, creative, and authentic mental structures (Dabrowski, 1964, 1996; Dabrowski et al., 1970). This is a self-organizing and nonlinear process, which deals with the increasing complexity of the mental structure as it differentiates and incorporates more and more elements from all basic mental life—especially emotions, thoughts, imagination, and memories—and then integrates these elements by constructing connections between these components.

Dabrowski writes:

The intellectual functions are always inter-connected with and dependent on emotions and drives, but the form of these connections changes accordingly in the phase of development....At higher stages of development both the intellectual and emotional functions come into an increasingly closer interaction, reciprocally advance the level of the other functions... (Dabrowski et al., 1970, p.136)

The Developmental Potential

The process of positive disintegration can be modeled by a sequence of patterns of organization (levels) as one's *developmental potential* changes. Dabrowski defines it as an original endowment which determines what level of development a person reaches if the physical and environmental conditions are optimal (Dabrowski, 1996; Piechowski, 1979, 1986). In other words, the developmental potential is necessary for bringing order to the chaos of the conflicts provided by the multiple components of the original endowment (Dabrowski, 1996).

The developmental potential contains three sets of factors that control development. The first factor represents innate constitutional and biological potentialities of the organism. The second factor represents all social environmental influences. The third factor represents those autonomous processes which a person brings into his development, such as internal conflicts, self-awareness, choices and decision in relation to personal growth, and conscious inner psychic transformation (Dabrowski et al., 1970).

When the developmental potential is limited to the biological first factor we are dealing with psychopathic individuals indifferent to social opinion and social influences. Such individuals are incapable of reflecting on their actions.

In cases where the developmental potential is limited to the first and second factors, we are dealing with individuals who, throughout their lives, remain under biological and social influences but lack personal autonomy. Changing influences shift the patterns of their behavior.

The developmental potential may have its full complement of all three sets of factors. In this case individuals consciously struggle to overcome their social indoctrination and constitutional typology. Such people become aware of their own development and their own autonomous hierarchy of values (Dabrowski, 1996).

According to Dabrowski, the developmental potential may be particularly strong when, in addition to these three factors, there are special abilities and talents and particular strengths of self-awareness and self-determination (Dabrowski, 1996).

Based on the observation of creative and gifted individuals, Dabrowski introduced additional factors that are a condition of development through positive disintegration. Overexcitability (OE) is defined as a higher than average capacity for experiencing inner and external stimuli, and is based on a higher than average responsiveness in the nervous system (Dabrowski, 1972, 1996). OE is similar to the concept of high sensitivity which leads towards high excitability (Aron, 1996; Eigen, 2004). Piechowski (2006). A close collaborator of Dabrowski suggested even to change this term to *heightened excitability*, which is a better translation of the polish word *nadpobudliwosc*. Dabrowski found that heightened excitability in gifted and creative people explained their intense daily life experiences.

Since the mid 1970s, extensive studies have been conducted based on the *Overexcitability Questionnaire (OEQ)* (Lysy, 1979; Lysy & Piechowski, 1983) in the United States, Venezuela (Falk, Manzanero & Miller, 1997), and Turkey (Yakmaci-Guzel & Akarsu, 2006). The studies in the United States and Venezuela demonstrated that artists exhibit high levels of imaginal, intellectual, and emotional OE. Results from the Turkish study show that students with high intellectual abilities score higher on imaginal and intellectual OE as compared to students with low intellectual abilities.

In the 1990s, the *Overexcitability Questionnaire –Two (OEQ II)* was created by a group of scientists from the Institute for the Study of Advanced Development (Falk, Lind, Miller, Piechowski, & Silverman, 1999). It has been translated into many languages including Chinese, Spanish, Turkish, and Korean. The findings from studies of gifted and talented individuals in

Spain, Mexico, Taiwan, and Turkey show cross-cultural validity for the concept of OE, and that OE is able to differentiate gifted from non-gifted populations (Falk, Yakmaci-Guzel, Chang, Pardo de Santayana Sanz, & Chaves-Eakle, 2008). .

There are five forms of psychic overexcitability; psychomotor, sensual, imaginal, emotional, and intellectual. For example, *psychomotor overexcitability* is the manifestation of a heightened energy level and nervousness; *sensual overexcitability* is characterized by the heightened experience of sensory pleasures; *imaginal overexcitability* manifests itself through expressive images and metaphors, fantasies, and animistic thinking; *intellectual overexcitability* is most frequently associated with an intensified activity of the mind and theoretical thinking, and an avidity for understanding and probing the unknown; finally, *emotional overexcitability* is a function of the experience of emotional relationships, manifested by strong attachments to persons, living things, or places (Dabrowski, 1996; Dabrowski & Piechowski, 1977a; Piechowski, 1986, 1999, 2006; Mendaglio & Tillier, 2006).

The intellectual, imaginal, and emotional overexcitability are crucial for personality development. Sensual and psychomotor overexcitability play supporting roles in development. The highest level of development is possible if all forms of overexcitability are present and the emotional form is the strongest (Dabrowski, 1996).

The five forms of overexcitability undergo extensive differentiation in the course of development. Emotional, intellectual, and imaginal overexcitability play a significant role in the formation of *developmental dynamisms* that shape and direct personality development (Dabrowski, 1996).

To summarize, potential development is the constellation of psychological features that are associated with advanced personality development. These features include the three factors that

control development (biological, social, and autonomous), special abilities and talents, and the five forms of overexcitability.

Developmental Dynamisms

Dabrowski introduces *developmental dynamisms* that are instinctual-emotional-cognitive forces fueling and shaping emotional development. They can interact either synergistically or antagonistically. Dynamisms fall into two categories: dynamisms that are characterized by spontaneity and lack of definite organization, and dynamisms that reshape, assimilate, and organize the process of positive disintegration (Dabrowski, 1973, 1996; Dabrowski et al., 1970).

The Levels of Development

To understand the theory of positive disintegration, it is important to distinguish between development through stages and development through levels. The first concerns biological development, going through determined periods common to human beings and to animals. The second refers to psychical development and depends on an individual's self-conscious work on himself. This type of development depends on one's self-reflection and on his sense of responsibility for his actions and choices.

According to Dabrowski, positive disintegration is a multilevel development where each level represents a qualitatively distinct, relatively stable and coherent developmental structure, characterized by a distinctive set of developmental dynamisms that interact with each other, creating a unique pattern of behavior.

The process of positive disintegration includes five clearly distinguishable levels: (1) primary integration, (2) unilevel disintegration, (3) spontaneous multilevel disintegration, (4) organized

multilevel disintegration, and (5) secondary integration (Dabrowski et al., 1970; Dabrowski, 1996). I propose that positive disintegration can be modeled by the sequence of transitions from a point attractor (primary integration), through a periodic attractor (unilevel disintegration), to a chaotic attractor (spontaneous multilevel disintegration), through the process of self-organization to an emerging order (organized multilevel disintegration) and finally to an order of increasing complexity (secondary integration) (Laycraft, 2009b, 2011) (Figure 21).

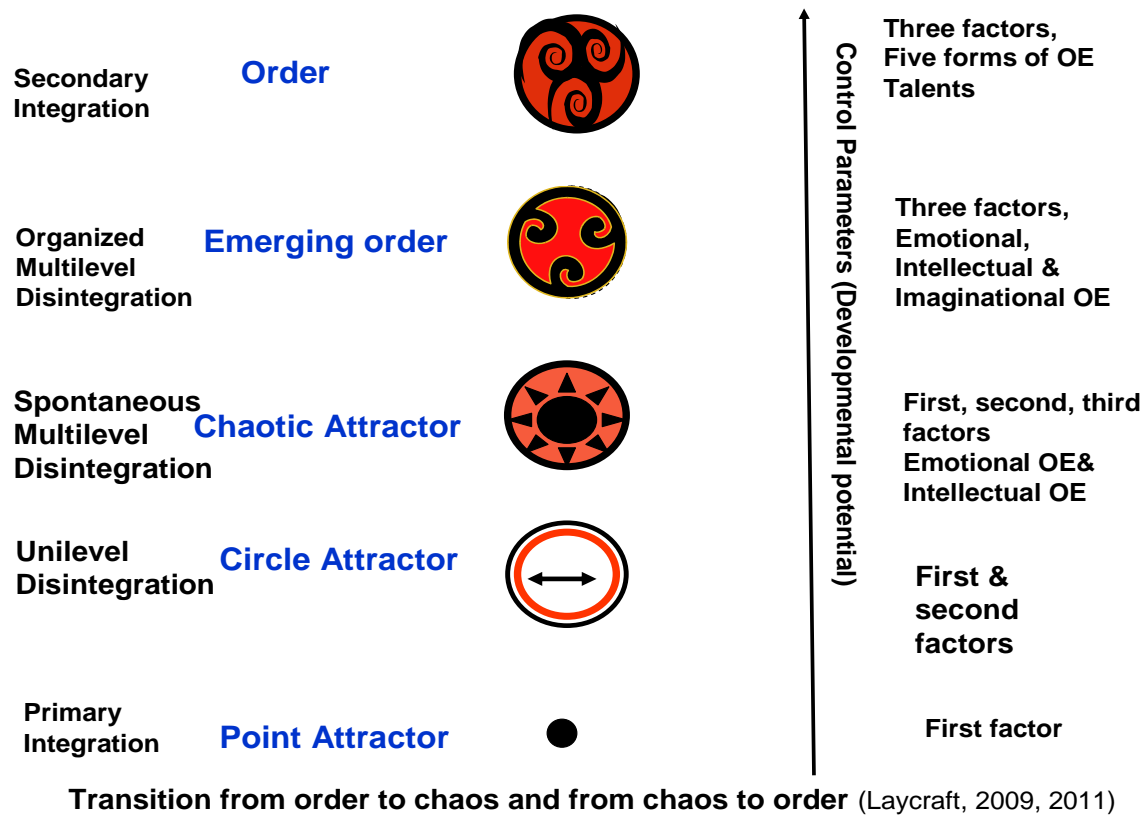


Figure 21 The levels of development through positive disintegration

Primary Integration Point Attractor



The first level of development, *primary integration*, defines a narrow, rigid, automatic structure governed by the first factor. No developmental dynamisms are associated with this mental structure. Individuals on this level are not capable of having internal conflict, although they often have conflicts with their external environment. Individuals cannot follow long-range plans and are limited to the reality of immediate, passing feelings (Dabrowski et al., 1970; Dabrowski, 1972, 1996). Strong external stimuli like grave life experiences and stresses may only temporarily bring some psychic changes (reflection), but they are short and ineffective. The system quickly returns to this same pattern of primary integration behavior (Dabrowski & Piechowski, 1977b). This level of development can be described by a *point attractor* (Laycraft, 2009b).

This level is comparable to Kohlberg's pre-conventional level, characterized by an egocentric attitude (stage 1 – obedience and punishment) (Kohlberg, 1969), and Kegan's first order of consciousness (Incorporate and Impulsive stages)—an awareness fixed upon sensations and impulses (Kegan, 1994).

During the period of adolescence, the developmental potential changes dramatically because of changes in the adolescent brain and body, which reciprocally influence cognitive and emotional growth. This is why it is proposed that adolescent development can be expressed by the next three levels of positive disintegration: the early period of adolescence is described by the second level, *the unilevel disintegration*; the middle period of adolescence is described by the third level, *the spontaneous multilevel disintegration*; and late adolescence and young adulthood is described by the fourth level, *the organized multilevel disintegration* (Laycraft, 2011) (Figure 22).

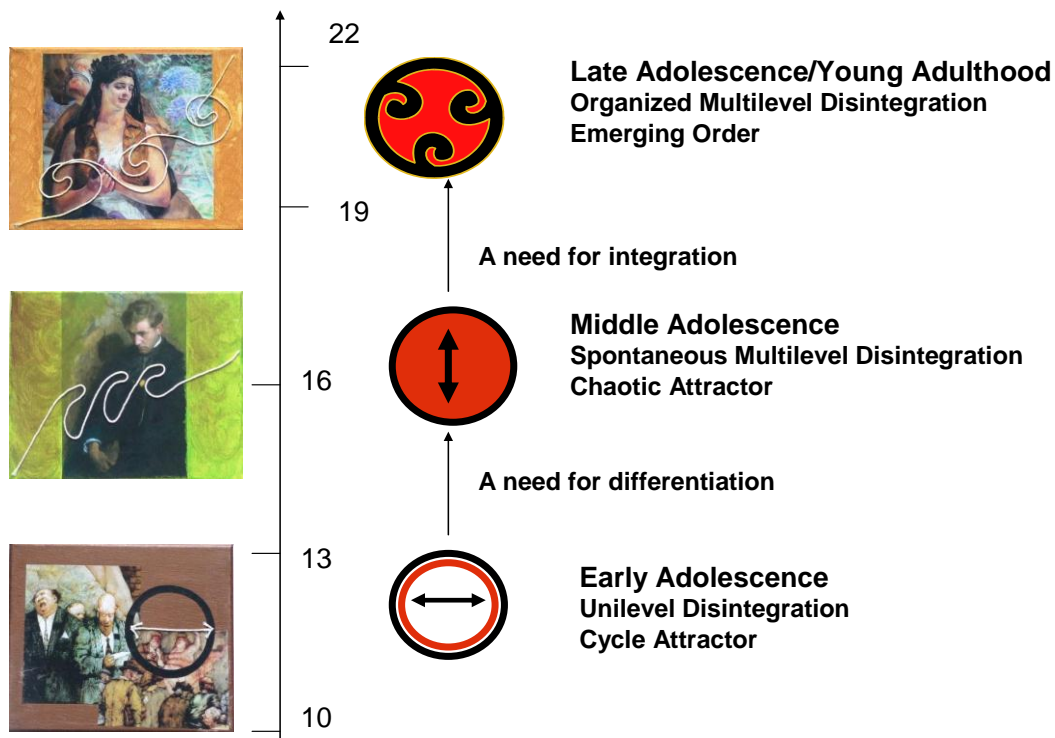


Figure 22 Theory of positive disintegration as a model of adolescent development

Unilevel Disintegration Circular Attractor



The unilevel disintegration begins with the loosening of the undifferentiated structure of primary integration. Rigidity is replaced by changeable feelings of like and dislike, approach and avoidance, fluctuations of moods, changeable and conflicting courses of action, indecision, and doubt. Patterns of thought are often circular. Internal conflicts appear but are unilevel. External conflicts persist from primary integration, but are not very aggressive and can be unpredictable. Behavior conforms to external standards (concern about what people will think or say). Unilevel disintegration can be described by the *limit-cycle attractor*, or by the *two fixed-point attractors* (Laycraft, 2011). It may be difficult to distinguish between these two attractor states. In both cases, the system oscillates between two different states over time (Vallacher & Nowak, 2009). The degree of instability varies in this level and it has many different patterns of behavior. Two cases of the unilevel disintegration are discussed below.

Case 1: The “unhealthy” unilevel disintegration can be described by a limit-cycle attractor, characterized by the pattern of changes between states without any particular default state. Dabrowski called it the “no exit” state. The tension experienced may be transported to the body,

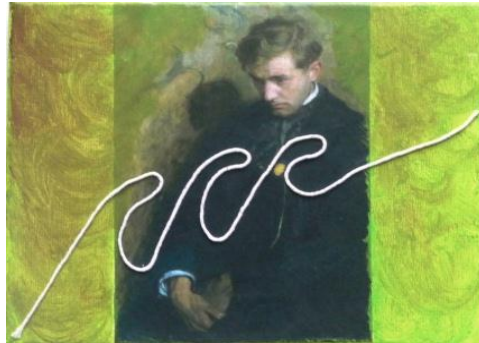
giving rise to psychosomatic disorders. Very often individuals in this state escape into alcohol, drugs, or suicide (Dabrowski et al., 1970; Dabrowski, 1972, 1996).

Case 2: The “developmental” unilevel disintegration can be described by a set of two fixed-point attractors which display a tendency to stabilize on a particular state. Here, external stimuli are necessary to push the system from one state to another (Vallacher & Nowak, 2009). This pattern is observed in early adolescence when young people can only think about isolated characteristics of the self (“...I am intelligent, gifted. But then, I see myself as a fool.”), or experience opposing emotions (approach and avoidance or joy and sadness) (Dabrowski & Piechowski, 1977).

Similar observation was done by Fisher (1980), who argued that young adolescents lack cognitive control, and as a result can only think about isolated characteristics of the self. They are not able to integrate the many single abstractions of the self constructed in different relational contexts. This contributes to unrealistic self-representations, and the oscillation between very opposite emotions: at one point in time one may feel intelligent, whereas at another point in time one may feel stupid.

This level is similar to Kohlberg’s pre-conventional level (level 2—self-interest orientation) (Kohlberg, 1969), and Kegan’s second order of consciousness (the Imperial stage), which is characterized by a concreteness point of view and the inability to recognize one’s own point of view and another’s simultaneously (Kegan, 1994).

Spontaneous Multilevel Disintegration Chaotic Attractor



As development continues, the third factor (the autonomous and intrapsychic processes) starts to operate and the unilevel disintegration bifurcates to the multilevel hierarchical organization – *the spontaneous multilevel disintegration*, characterized by an extensive differentiation of psychological structure. Individuals recognize higher and lower levels of experiences and search for examples and models in their environment. This level is characterized by an increasing role of inner conflict and a gradual decrease in the frequency of external conflict. Internal conflicts reflect a hierarchical structure of cognitive and emotional life: “what is” versus “what ought to be.” A previously unilevel attitude of like and dislike is transformed into an understanding of others and a growing desire to have more selective and deeper emotional relationships. This state is dramatic, marked by a sharp turning toward oneself in order to seek solutions within oneself (Dabrowski, 1972). The transition from the unilevel disintegration to the multilevel disintegration phase of development is the most crucial and the most unexpected developmental event. This process is similar to Mahoney’s “personal revolution” (Mahoney, 2003).

There is a discontinuity between these two levels. Such discontinuity (e.g. phase transitions, bifurcations, or catastrophe) can be studied by theoretical models of different branches of non-linear dynamical systems theory, such as catastrophe theory (Thom, 1975), theory of dissipative

structures (Nicolis & Prigogine, 1977; Prigogine, 1980; Prigogine & Stengers, 1984), and synergetics (Haken, 1984, 1987).

A general mechanism for phase transition is based on the notion of self-organization in complex, nonlinear systems. As the control parameter passes through a critical point, a qualitative change in the attractor may take place, allowing the system to find a new pattern of behavior. Phase transitions are characterized by global reorganization, where new configurations require the cooperation of all system components.

The phase transition between the unilevel disintegration and the spontaneous multilevel disintegration is characterized by an abrupt change from horizontal (the limit-cycle attractor or by the two fixed-point attractors) to vertical motion when a control parameter (the developmental potential) approaches the third factor (the autonomous processes) (Laycraft, 2011). Dabrowski writes: “The appearance of a split between the “lower” and the “higher” marks the emergence of a vertical direction in development which pushes from within, as it were, and is strongly felt but not entirely clear to the individual as to its nature, hence the name ‘spontaneous’” (Dabrowski, 1996, p.35).

It is proposed that this level of development describes the behavior of middle adolescents. The process of the differentiation of the mental structure is global and influences the whole mental structure. Differentiation leads to chaos and to the growth of entropy (Bertuglia & Vaio, 2005). The chaotic behavior of this level is the result of nonlinear and recursive interaction between different dynamisms. Developmental dynamisms are the product of the five forms of overexcitability that undergo extensive differentiation in the course of development. The strength of overexcitabilities contributes to the developmental potential and

can be viewed as a channel through which information flows in the form of sensations, feelings, experiences, images, ideas, hopes, and desires....These channels can be wide open, narrow, or operating at bare minimum. They assume to be part of a person's constitution and to be more or less independent of each other. If more than one of these channels has wide apertures, then the abundance and diversity of feeling, thought, imagery, and sensation will inevitably lead to dissonance, conflict, and tension. (Piechowski, 1999, p. 327)

These inner tensions and conflicts create a far from equilibrium state and the rapid flow of energy (information) links the components of the mental structure into coherent, higher order forms. As Prigogine and Stengers wrote: "at equilibrium molecules behave as essentially independent entities; they ignore one another...However, non-equilibrium wakes them up and introduces a coherence quite foreign to equilibrium" (Prigogine & Stengers, 1984, p. 181). These higher-order arrangements are developmental dynamisms, and through them the abrupt changes in human behavior can be observed. Developmental dynamisms such as *astonishment with oneself*, *disquietude with oneself*, *dissatisfaction with oneself*, *feelings of inferiority toward oneself*, *feeling of shame and guilt*, and *positive maladjustment* act as loops of positive feedback. They push the mental structure further into a chaotic state and create an instability that becomes strong enough to shatter the pre-existing organization.

According to Dabrowski (1996), "The instability and partial or even complete disorganization of behavior is necessary in the process of development from a lower level to higher level of mental functioning" (p. 11).

This level can be described by a chaotic attractor (Laycraft, 2009b, 2011).

Dynamisms of the Spontaneous Multilevel Disintegration

In this section, the developmental dynamisms of the level of spontaneous multilevel disintegration are discussed. The quotes in this section are taken from a diary of a seventeen old girl (Troszkiewicz 1966).

The first phase of this level is characterized by emotional-cognitive dynamisms:

- *astonishment with oneself* – the first phase in the authentic observation of oneself and the beginning of the desire to change (“I don’t know what is going on with me...”),
- *disquietude with oneself* – the search for the meaning of one’s behavior and existence—a growing attitude of self-criticism, with emotional tension and readiness toward inner psychic transformation (“I know that, whatever it is, it is not good.”),
- *dissatisfaction with oneself* – a critical, condemning attitude toward oneself accompanied by states of anxiety and depression (“I don’t know how to clearly formulate my thoughts or maybe I don’t have my own thoughts”), and
- *feeling of inferiority toward oneself* – the awareness of the possibility of development, the awareness of weakness and, at the same time, the feeling of one’s potential and strength (“My great desire is to express myself and deepen my knowledge.”).

These dynamisms create states of self-observation, self-reflection, self-awakening, self-criticism, and self-awareness. The dynamisms of the first phase of multilevel disintegration are the primary product of emotional overexcitability, and the intellectual overexcitability enhances the development of self-awareness (Dabrowski, 1996).

A further emotional-cognitive development creates a new class of emotions called self-conscious emotions. Self-conscious emotions include *embarrassment*, *shame*, *guilt*, and *pride*. These emotions require the ability to evaluate one’s self and to infer the mental states of others (Dabrowski, 1996; Damasio, 2003). Self-conscious emotions are important for helping

individuals recognize and correct their social mistakes, strengthen social bonds, renew commitment to relationships, and motivate positive behavior (Tangney, Miller, Flicker, & Barlow, 1996). They provide internal feedback about a specific goal, expectation, or standard that has been violated. Violation of social conventions may result in embarrassment. Violations of character ideals are associated with shame. Violations of rules, related to harm, justice, and rights relate to guilt (Keltner & Buswell, 1997).

The following fragment from the diary of a 17-year-old girl illustrates her critical and condemning attitude toward herself, dissatisfaction with herself, and feeling of shame and guilt in relation to her mom and herself.

Tears are the expression of a variety of feelings; enjoyment, sadness, anger, delight, nervousness, doubt in ourselves and fight with ourselves. Ever since yesterday, I experience the fight with myself. I can't get along with my brother. I know that he is not bad, but he is stubborn like me and very hot tempered... Above all I think about my mom, who knows how much bitterness and nervousness is created by one stupid quarrel. After each fight I find that it is low and inhuman. I don't wish anybody to experience those horrible moments.... (Troszkiewicz, 1966, p. 30)

In the third phase of spontaneous multilevel disintegration, *positive maladjustment* emerges. This is the dynamism of a conscious and selective rejection, a need for adaptation to a higher hierarchy of value, and is characterized by a lack of adjustment to certain external or internal conditions. It expresses the drive toward accelerated development, self-perfection, and the realization of an attitude of autonomy and authenticity. The dynamism of positive maladjustment is connected with the understanding of others and their needs (Dabrowski, 1973). Another fragment from the girl's diary illustrates these emotions:

I think that I am bad. I am trying to change myself, to be more feminine. I want to be more serious, more thoughtful and have more time for my parents. I love them so much. When I write it I almost cry...I promise here this: I will read more, not only prose but also poetry...I will be helpful to mom and I'll be good for dad...I will not argue with my brother, and I will control my feelings of anger.... (Troszkiewicz, 1966, p.51)

By observing and studying gifted and creative people, Dabrowski proposed that *creative dynamisms* emerge during the process of spontaneous multilevel disintegration. Creative dynamisms arise from above-average sensitivity, and develop under conditions of emotional turmoil, mental tension, and external and internal conflicts. They are associated with nervousness, sadness, depression, and existential anxiety. Creative dynamisms help to break the barriers of routine (structure-breaking) and liberate oneself from automatic experiences in order to achieve inner autonomy. Creative dynamisms give rise to the urge to disapprove of “what is” in order to replace it in oneself by “what ought to be.” They are an expression of a “psychological awakening”, an important outlet for the increased tension of inner conflict, and an important force of defense against mental illness. As a result of creative dynamisms, individuals can experience the states of elation, pleasure, pride, and joy (Dabrowski et al., 1970; Dabrowski, 1973).

Middle adolescents have well-developed emotional systems, but the cognitive systems are still developing. While emotional functions acting as positive feedback are stronger than cognitive functions acting as negative feedback, the mental structure is still in a chaotic state.

Fisher (1980) introduces the concept of “abstract mapping” to explain the cognitive ability of middle adolescents to differentiate between single self-representations. The adolescent can now “map” constructs about the self onto one another, but cannot yet integrate such self-

representations in a way that would resolve obvious inconsistencies. The awareness of these opposites produces internal conflict, confusion, and uncertainty about which characteristics to adopt (Harter, 1999).

The self-discrepancy theory developed by Higgins (1987, 1989) illustrates well the emotional and psychological turmoil of adolescents. This theory differentiates between domains of self-representation (i.e., the actual self, the ought self, and the ideal self) and inferred perspectives on the self (i.e., one's own perspective, and the parental perspective). The experience of discrepancy between the actual-self and the ought self or the ideal self provokes emotional distress and the desire to reduce discrepancy.

Kegan (1994) suggests that the period of adolescence is a period in need of support for the gradual evolution of the mind from the second to the third order of consciousness. Adolescents begin to think abstractly, to understand the needs of other people, and to experience self-reflexive emotions.

The positive maladjustment and creative dynamisms help to reorganize a disintegrated mental structure (structure-building) and to build a new reality through an expanded awareness. It is a starting point for the transition to the next level of development.

The Organized Multilevel Disintegration Emerging Order



As the development continues, the individual takes an initiative in organizing a hierarchy of his own inner world. This is a period of the *organized multilevel disintegration* directed and controlled by highly conscious, autonomous, and self-determining developmental processes. These processes act as negative feedback to stabilize and organize the mental structure. The characteristic feature of this level is the conscious transformation of oneself and the synthesis that leads to the increasing stabilization of the hierarchy of value. There are still some existential and philosophical conflicts at this level, but with lesser tension. This level of development describes behavior of older adolescents and young adults who have a greater ability to systemize experiences and to take their development into their own hands. They focus on their own futures and personal goals. Often during late adolescence and early adulthood individuals choose an interest that will later be the central theme of their lives. This level is characterized by openness to external experiences, sensitivity, and identification with others. Behavior changes towards self-perfection and emotional relationships become deeper and enduring (Dabrowski, 1972, 1996; Dabrowski et al., 1970; Dabrowski & Piechowski, 1977).

It can be compared to “dissipative structures,” which maintain their existence by interacting with their environment and maintaining the flow of energy into and out of the system (Prigogine, 1980, 1997; Prigogine & Stengers, 1984). Mental structure transforms itself into a new ordered state of increased complexity and therefore of increased stability. An emerging order (dissipative structure) is characterized by a “symmetry-breaking” process (break of the symmetry between past and future) (Prigogine, 1980).

This gives rise to a personal, subjective transformation of time, parallel and interwoven with the objective temporal realm. Needless to say, a symmetry-breaking process unfolds a new space-time dimension that affects the reorganization of selfhood processes and make available new knowledge abilities and experience domains. (Guidano, 1987, p. 68)

Dynamisms of the Organized Multilevel Disintegration

The dynamisms of the organized multilevel disintegration work closely together, and stabilize and organize the mental structure.

The main dynamisms are:

- *“Subject-object” in oneself* – critical self-observation, self-evaluation, and conscious need for development, working closely with the dynamism of inner psychic transformation (*“Suddenly, I realized that knowing myself is a great delight. Since I struggled for myself and realized my dream, I became friend with myself.”*),
- *The third factor* – the autonomous forces of self-directed development and conscious choices in development (*“Fortunately, some years have passed and I have changed, calmed down and found my own path.”*),

- *Self-awareness* – the awareness of one’s identity and of one’s individual uniqueness (“*I begin to enjoy being a woman.*”),
- *Self-control* – brings order and unity into one’s development, increasing calmness and confidence,
- *Creative dynamisms* – participates in organization of new, more complex structure, and
- *Empathy* (Dabrowski, 1996; Dabrowski & Piechowski, 1977a).

During the period of older adolescence and early adulthood, the individual can integrate potentially opposing attributes into higher-order abstractions. Such higher-order abstractions bring meaning and authenticity to what at an earlier time appeared to be upsetting contradictions within the self (Harter, 1999). Higher levels of emotional and emotional-cognitive functions produce greater psychic complexity, heightened creativity, self-awareness, and social responsibility. They interconnect and reciprocally advance the level of the other functions. For example, the key factors of empathy are: (a) “subject-object” in oneself – perceiving others as subject, (b) self-awareness, (c) the third factor – conscious choices, and (d) self-control. They intertwine and interact with one another to produce the dynamism of empathy. (Dabrowski, 1996).

The description of this level finds its counterpart in Kegan’s (1994) third consciousness, which corresponds to interpersonal and institutional self stages that describe a sense of self which is aware that both the self and others are independent needful beings. This self is also able to construct long-range plans and make important life choices and decisions.

Secondary Integration Order



The fifth level, *secondary integration*, represents the highest level of development and consists of a new organization and harmonization of personality. Personality means a self-aware, self-chosen, and self-affirmed structure. The main dynamisms active at this level are responsibility for oneself, responsibility for others, autonomy, and authenticity. There are no internal conflicts. There is a profound and active empathy toward all people and the individual reaches his own ideal (Dabrowski, 1967, 1996; Dabrowski et al., 1970).

This level is comparable to Kohlberg's post-conventional level (level 6), characterized by mutual respect as a universal ethical principle (Kohlberg, 1969), and Kegan's fourth consciousness (self-authorizing), characterized by self-regulation, self-formation, identity, autonomy, and individualism (Kegan, 1994).

CHAPTER FIVE:

INTERPRETATION OF THE THEORY OF POSITIVE DISINTEGRATION BY THE AFFECT – SPECTRUM THEORY

To interpret the developmental dynamisms of the theory of positive disintegration, I apply the affect–spectrum theory.

Dynamisms of the Spontaneous Multilevel Disintegration

Astonishment with oneself is the first phase of the authentic and critical observation of oneself and the beginning of the desire to change. It is the preliminary stage of the “Subject and Object” in oneself dynamism—the separation of a subject that wonders and the object to which her “wondering” refers. It is a feeling that some of one’s mental and emotional qualities are surprising, unexpected, or strange (Dabrowski, 1973; Dabrowski & Piechowski, 1977a). This dynamism can be expressed by a combination of two primary emotions: *surprise/astonishment* and *anticipation*. These two emotions create a state of confusion and conflict – (“I don’t know what is going with me.”). Anticipation has a substantial cognitive component. “To be interested in something is to have one’s attention captured by it...” (Ortony & Turner, 1990, p.318). *Surprise* is a subjective term describing an orienting response: it begins with sudden attention, which evolves into astonishment (TenHouten, 2007). This secondary emotion of confusion/conflict starts to create a state of disequilibrium in the young psyche, which is developmentally very important.

Disquietude with oneself is a search for the meaning of one’s behavior and existence. It is marked by a growing attitude of self-criticism with emotional tension, feelings of fear, anxiety and uneasiness with oneself, and “readiness toward inner psychic transformation” – (“I know

that, whatever it is, it is not good.”). It is an emotional-cognitive dynamism taking part in the process of the reorganization of one’s own mental structure. A combination of the three emotions of *anticipation*, *surprise*, and *fear* describes this dynamism. They create three secondary emotions: anticipation and surprise create *confusion* or *conflict*, anticipation and fear create a state of *anxiety*, and, finally surprise and fear create the emotion of *alarm* or *awe*. As I discussed above, confusion creates a state of disequilibrium in the mental structure of young people. Anxiety on this level of development is the first sign of self-awareness and can contribute to further mental and emotional growth. And finally a state of awe can be understood as an inability to assimilate the experience into one’s current mental structure (Keltner & Haidt, 2003).

Dissatisfaction with oneself is a critical and condemning attitude toward oneself accompanied by a state of anxiety and depression. Dissatisfaction with oneself is one of the strongest dynamisms of the first phase of multilevel disintegration. It is a complex dynamism, including four primary emotions: *anticipation*, *surprise*, *fear*, and *anger*. We can look at the tertiary emotion of *disquietude with oneself* joined with the primary emotion of *anger*. Anger combined with surprise creates a strong feeling of *outrage*, and anger with anticipation creates *aggressiveness*. Strong dissatisfaction with oneself is one of the indicators of accelerated development and expresses a strong determination for change (Figure 23).

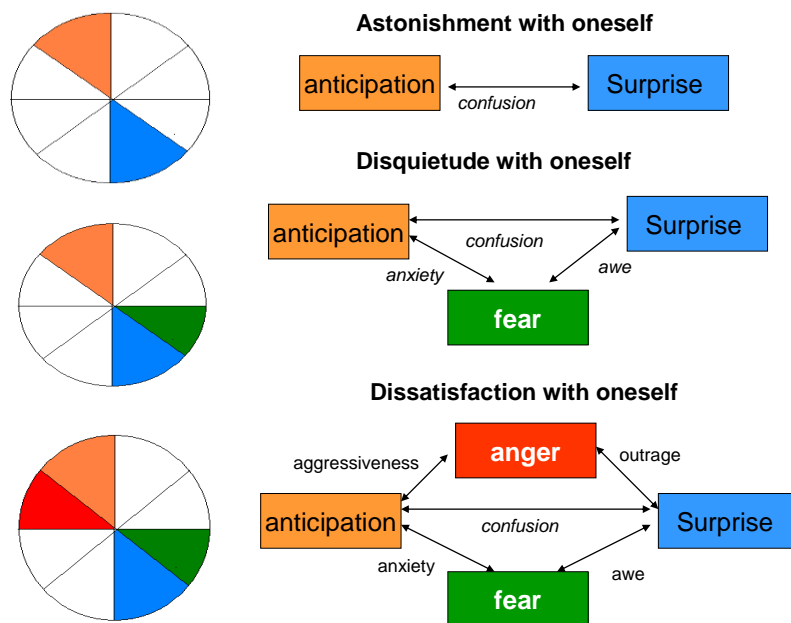


Figure 23 Dynamics of the first phase of the spontaneous multilevel disintegration

Self-conscious emotions appear in the second phase of the spontaneous multilevel disintegration. Self-conscious emotions include embarrassment, shame, and guilt.

These emotions require the ability to evaluate oneself and to infer the mental states of others (Dabrowski, 1996). Self-conscious emotions are important for helping individuals recognize and correct their social mistakes, strengthen social bonds, renew commitment to relationships, and motivate positive behavior.

Embarrassment, a fearful sadness, involves a compulsion to escape the situation (the behavior of fear, moving away from). Embarrassment is an effective mechanism of social control, for it inhibits behavior that carries with it the fear of discovering that one's real self does not accord with the ideal self. In embarrassment, the individual has, perhaps for a moment, lost

something, even a possibly unrealistic conceptualization of the self, and this is a condition for sadness (Babcock, 1988).

Shame is the feeling of self-conscious distress over one's deficiencies and violations of character ideals. It is often combined with a need to withdraw, or hide (fear). Similar to embarrassment, shame is a secondary emotion of *sadness* and *fear*.

Guilt consists in discomfort over moral failure and contains the feeling of *pleasure* and the feeling of *fear*. If there were no temptations, based on the anticipation of pleasure, there would be no need for social sanctions and therefore no need for guilt. Guilt arises from an isolated act, or series of acts, that hurt another person. The guilty person can try to repair the damage done by performing voluntary actions such as offering apologies, making excuses and so on (TenHouten, 2009, p. 94). The feeling of guilt is the foundation for the higher dynamism of responsibility (Figure 24).

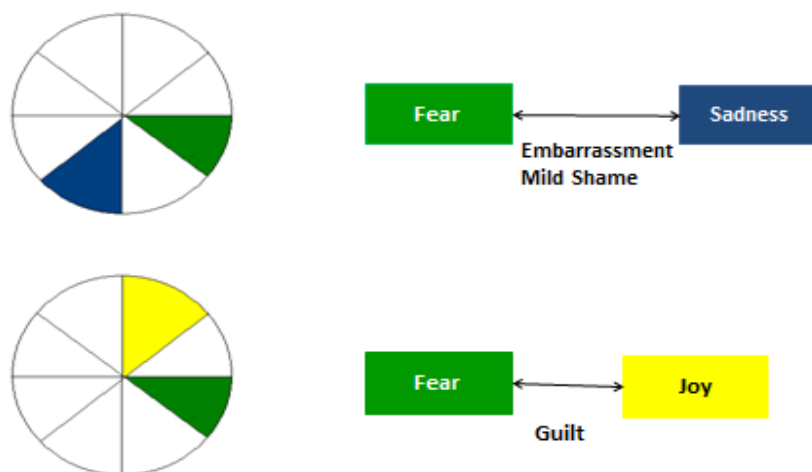


Figure 24 Dynamisms of the second phase of spontaneous multilevel disintegration

The third phase of spontaneous multilevel disintegration is characterized by *positive maladjustment*, which is a conscious and selective rejection of the standards and attitudes of one's social environment that are conflicting with one's growing awareness of higher values. The individual is in the process of adapting to a higher hierarchy of values, expressing the drive toward accelerated development and self-perfection, and developing attitudes of autonomy and authenticity. In such cases, positive maladjustment acts as an opponent of the second factor (social influences). It is connected with the understanding of others and their needs (Dabrowski, 1973; Dabrowski & Piechowski, 1977a). The main primary emotions of this dynamism are *rejection* (of a lower hierarchy of values), *acceptance* (of a higher hierarchy of values), *anticipation* (in the process of developing these higher values), and *anger* (seeing the lower values in a social environment). A combination of anticipation and acceptance creates the secondary emotion of *sagacity*, or *resourcefulness*. Sagacity can be defined as "keenness and soundness of judgment in the estimation of person or condition and in the adaptation of means to ends" (Oxford, p. 2620). A combination of anger and rejection create the secondary emotion of *contempt*, which involves "the feeling or actions of a person toward someone or something considered low, worthless, or beneath notice" (Webster, p. 300). This dynamism of positive maladjustment can be understood as a transition from the chaotic state of the spontaneous multilevel disintegration to a more ordered state of the organized multilevel disintegration (Laycraft, 2009b) (Figure 25).

Positive Maladjustment

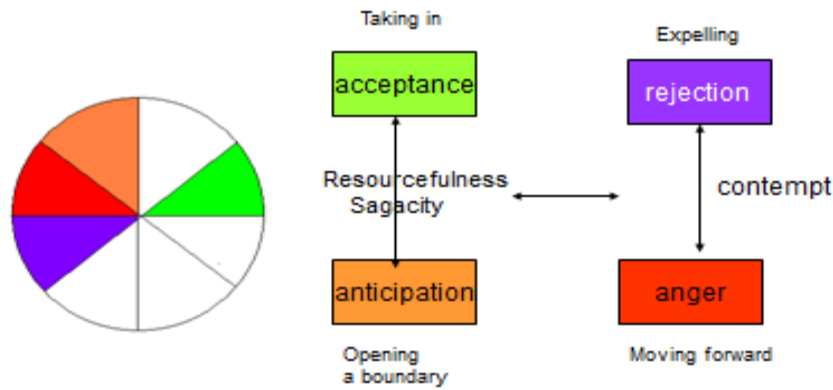


Figure 25 Dynamism of positive maladjustment

Dynamisms of the Organized Multilevel Disintegration

The dynamisms of the organized multilevel disintegration work closer together and stabilize and organize the mental structure.

“Subject–Object“ in oneself is a critical self-observation, self-evaluation, and conscious need for development. The main emotions of this dynamism are *anticipation*, *acceptance*, *surprise*, and *joy*. “Subject-Object” in oneself permits the individual to open her own psyche for self-observation (anticipation). The subject is objectively grasping its own content almost as though it were an external phenomenon. Through observation and analysis, the individual gains knowledge of herself, of her motives, and aims (acceptance). The combination of anticipation and acceptance create the secondary emotion of *resourcefulness*, which has a substantial cognitive content, as it involves thoughtfulness as one attempts to understand herself better and to evaluate herself critically. Very often this dynamism appears suddenly in the form of a synthetic act that can be expressed as the *surprise* of one’s own behavior. If this act is compatible

with the ideal self then the individual experiences *delight* as a combination of surprise and joy. This feeling brings a sense of one's uniqueness and personal identity. In the opposite situation, the individual experiences *disappointment*, which is a combination of surprise and sadness. Disappointment is seen as normal and essential for personal growth. The "Subject-Object" in oneself dynamism is the circular process of development that works closely with the dynamism of inner psychic transformation (Dabrowski & Piechowski, 1977a).

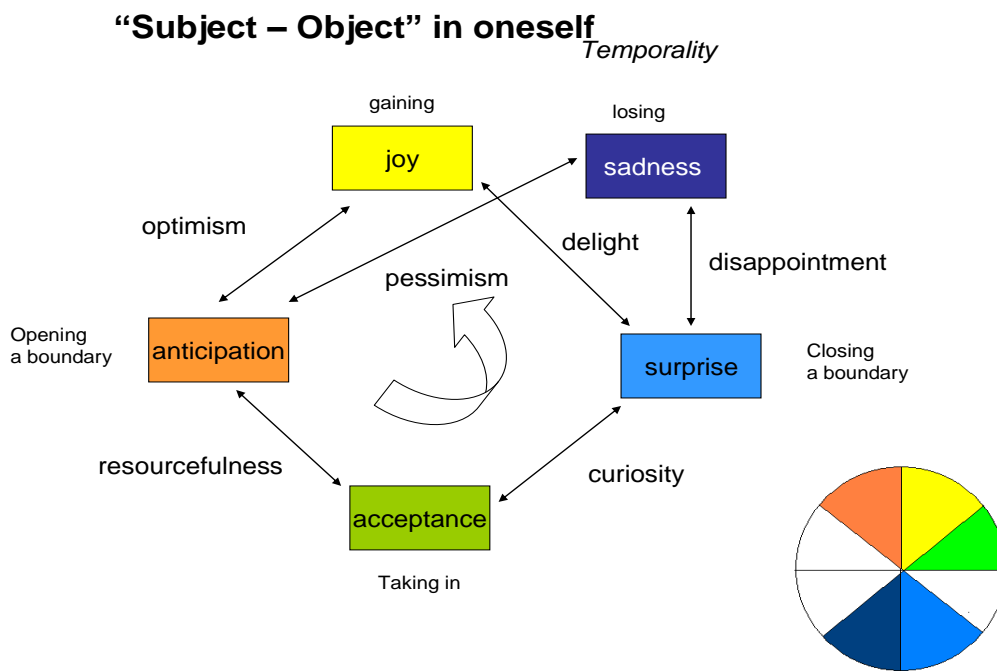


Figure 26 Dynamism of "subject-object" in oneself

The next very important dynamism of the organized multilevel disintegration is *the third factor*, which represents the autonomous forces of self-directed development and conscious choices of development. As a result of this dynamism the individual begins to realize what is essential and lasting for her development.

I look at this dynamism as a process of decision-making in our personal or immediate social lives. Usually this process concerns our future and involves great uncertainties and complexity.

Damasio (1994) proposes that during our decision making, secondary emotions play an essential role. When we make a choice, a variety of mental images or thoughts regarding our choice is appearing and disappearing continuously in our consciousness. We also start to experience some feelings about it. Damasio calls these feeling and thoughts “somatic markers” because they are signals coming from our body. They may lead to the rejection of some options (negative somatic markers) or to the acceptance of other options (positive somatic markers). Damasio (1994) defines somatic markers as “a special instance of feelings generated from secondary emotions. Those emotions and feelings have been connected, by learning, to predicted future outcomes of certain scenarios” (p. 174).

To illustrate this process I give an example of a life choice made by Anne, one of my participants. During her late adolescence and young adulthood, Anne traveled through South America where she worked with a group of craftsmen, drawing designs for their products. During this time, she experienced many emotions such as delight (surprise & joy), curiosity (surprise & acceptance), love (joy & acceptance), resourcefulness (acceptance & anticipation), and optimism (anticipation & joy). After returning to Canada, she finished her education as a teacher, got married, and became an activist. But unfortunately Anne became extremely unhappy and depressed. She also had an incredible health issue. She had to make a drastic change in her life. Anne decided to change her profession and to start studying art. Why did she make this kind of choice? In accordance with Damasio’s idea of somatic markers, her emotions of love, friendliness, curiosity, optimism and delight, which she developed during her adolescence, helped her to make this extreme change in her life and to choose to pursue an artistic career.

These emotions became the positive somatic markers that motivated her decision and were triggered by an exciting future outcome similar to her past experience.

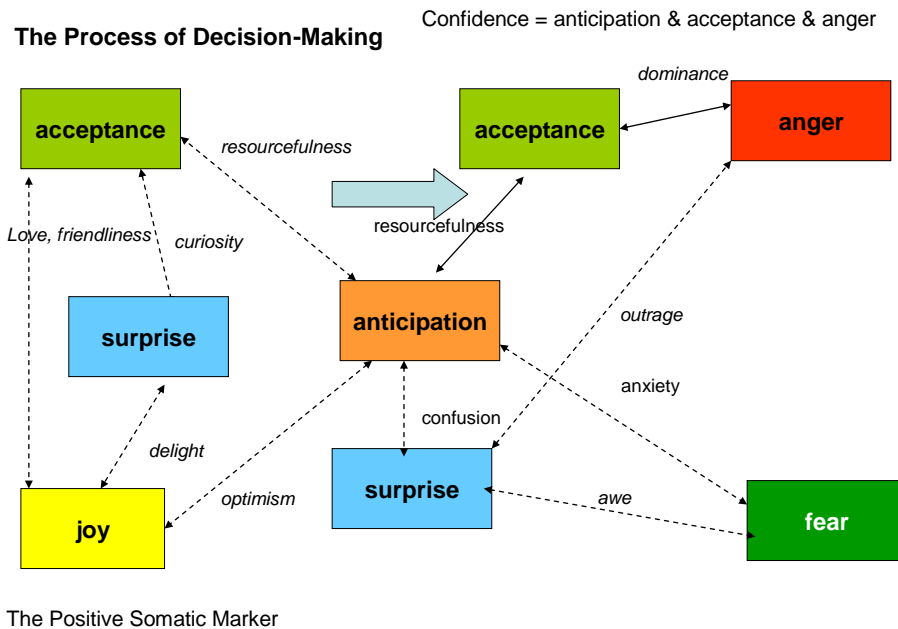


Figure 27 Emotions involved in the process of making decisions

After the help of these positive somatic markers, Anne had to decide to act in order to accomplish her goal. In this stage of the process, three primary emotions are involved: 1) *anticipation*, referring to the ability to plan; 2) *acceptance*, which involves the “taking in” of this plan; 3) and finally *anger*, which means moving forward with that plan. These three emotions joining together create the tertiary emotions of *confidence*. This complex emotion is oriented toward the future. The confident person is able to feel strongly about the direction of her development and is committed to giving a sense of certainty to what is unknown. The confident person is prepared to act regarding the realization her objectives.

But during this process the individual has to be prepared to overcome all kinds of difficulties and obstacles that can create emotions such as *surprise*, *fear*, *confusion*, *awe / alarm*, *outrage* and *anxiety* (TenHouten, 2007).

Surprise is the adaptive reaction to a negative experience of territoriality. To move toward an objective, overcoming obstacles toward its realization requires the primary emotion of *anger*. But if one's mistakes or the actions of others introduce an overwhelming blockage, then it is necessary to withdraw and to retreat. This is mostly a reaction of fear.

Confusion combines surprise and anticipation. It appears at the beginning of the decision-making process. It is very helpful and forces us to restore our strategy and tactics.

Awe / Alarm combines fear and surprise and is usually triggered by the aggressive behavior of someone who opposes and blocks the individual's objectives. It is necessary to respond quickly and effectively to this aggressive behavior.

Anxiety is a fearful anticipation, a fear of the future. The struggle to create a desired future involves the attempt to reduce uncertainty, but this effort is never fully accomplished; a normal anxiety is always to be anticipated.

Outrage is a combination of anger and surprise and is the opposite of anxiety; it consists in the contemplation of possible future misfortune (anticipation & fear). Outrage is a reaction to an event that was not anticipated but rather came as a complete surprise, and it can invoke great anger.

CHAPTER SIX:

THE INTERPRETATION OF THE ADOLESCENT BRAIN DEVELOPMENT

Introduction

In this chapter, I interpret adolescent development based on recent neuroscience research (Laycraft, 2011).

In particular, I pay attention to the changes in the limbic and cortical systems that are responsible for integrating the cognitive and emotional components of psychological functioning.

The limbic system mediates emotional states that orient attention and action to whatever is meaningful. The key structure of the limbic system is the amygdala that links the neural stimuli with emotional content.

There are two cortical systems (medial prefrontal cortex): the anterior cingulate cortex (ACC) and the orbitofrontal cortex (OFC) that serve as an interface between the prefrontal cortex and the limbic system. They mediate cognitive activities relevant to emotional state. The prefrontal cortex (PFC) appears to be critical for mature decision-making and cognitive control of emotional responses (emotional regulation).

New imaging techniques, especially magnetic resonance imaging (MRI), are responsible for an enormous leap in the study of the adolescent brain. The MRI studies have shown that, during adolescence, the brain is in a dynamic state. A brain of an early adolescent is different in anatomy, biochemistry, and physiology than that of a brain of a late adolescent. The teen brain has an enormous neural plasticity and undergoes disorganization and reorganization for almost a decade (Spear, 2000). Gray matter in the frontal lobe increases during pre-adolescence, with its

maximum size occurring at 12.1 years for males and 11.0 years for females. Temporal lobe cortical gray matter peaks at 16.7 years for girls and 16.2 years for boys. The process of *proliferation* is followed by *pruning*—a cutting back of inefficient or ineffective synaptic connections (gray matter) to achieve maximal efficiency of function during the adolescence period (Giedd, et al., 1999; Sowell, et al., 1999, 2001, 2002). Gogtay and his colleagues (2004), based on longitudinal studies, similarly show that the gray matter (GM) volume increases at earlier ages, followed by a sustained loss starting around puberty. The process of GM loss begins first in dorsal parietal cortices, and then spreads over the frontal cortex, the parietal, occipital, and finally temporal cortex. The loss of GM in the dorsolateral prefrontal cortex appears at the end of adolescence.

Parallel to the process of pruning, MRI studies show a steady increase in white matter—*myelination* in the frontal, parietal, and temporal cortices—throughout adolescence (Giedd, 2004; Sowell, et al., 2002; Luna & Sweeney, 2004). The myelination during adolescence contributes to the development of executive functions in the brain, including faster information processing, by facilitating the integration of distributed brain areas and enhancing local connections (Luna & Sweeney, 2004; Benes, et al., 1994; Thompson, et al., 2000).

The period of proliferation, pruning and myelination is an extremely important period for the self-organization of the adolescent brain.

Brain of Early Adolescents

During early adolescence, the cognitive processes that underline the ability to inhibit inappropriate behaviors and abstract thinking are evolving. Behavior of young teens can be described by the *low-road (short route)* processing. The external stimuli reach the amygdala by

way of direct pathways from the thalamus. This path is short, and transmission is fast but unfiltered and biased toward evoking responses (LeDoux, 1996, 2002). This processing leaves the individual in a state of intense emotions, impulsive reactions, and rigid and repetitive responses. The individual here is lacking in self-reflection.

Brain of Middle Adolescents

The middle adolescence period is characterized by the process of pruning and myelination, which introduce natural changes in the synaptic configuration in the limbic and cortex structure of the adolescent brain. As a result of these changes, the individual experiences a wide variety of emotions that evoke states of self-observation, self-reflection, self-awakening, self-criticism, and self-awareness. As a consequence, emotions introduce changes in individual's behavior and influence his or her development.

A variety of neurological studies have shown that the anterior cingulate cortex (the ACC) is involved in self-awareness (Botvinick, et al., 2001; Eisenberger et al., 2003; Lou, et al., 2004) and self-reflection (Johnson, et al., 2002), in first-person reports of mental states like emotions, self-generated thoughts, and intentions to speak (Cabeza & Nyberg, 2000), in self-referential mental activity (Gusnard, et al., 2001), and in the development of the autobiographical self (Damasio, 1999).

Based on this research, it is suggested that when the ACC begins to mature, and the connections between the amygdala and the anterior cingulate cortex increases, a stimulus that might earlier have initiated an automatic behavioral routine comes to be treated with a more reasoned, reflective, and deliberated response. The ACC is a part of a circuit involved in a form of attention that serves to regulate both cognitive and emotional processing (Figure 28).

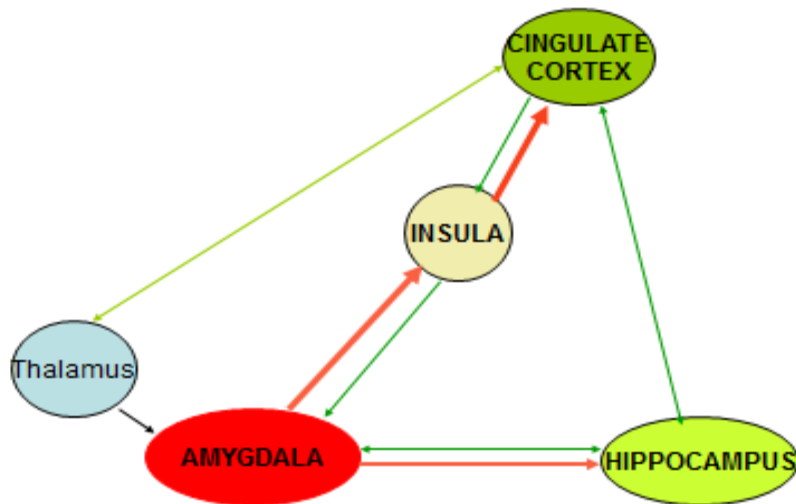


Figure 28 Neural connections of self-awareness

Both lesion and imaging research suggest that the prefrontal cortex, especially the orbitofrontal cortex (OFC), the temporal lobes, and the amygdala are involved in understanding other people's mental and emotional states. For example, embarrassment has been mainly associated with the orbitofrontal cortex and temporal lobes (Beer, et al., 2003, 2006; Takahashi, et al., 2004). The OFC located behind and above the eye orbits is involved in the regulation of social behavior and in critical human functions such as social adjustment, and controls mood, drive and responsibility. The OFC is richly connected with the anterior cingulate cortex and with the area associated with emotional and social processing, including the amygdala and the hippocampus (Adolphs, 1999, 2003; LeDoux, 2002), and appears to play a crucial role in the human capacity to sense other people, to understand interpersonal interactions (Siegel & Harzell, 2003), and to be involved in the working memory about emotional information (Bechara, et al., 2000; Damasio, 1999, 2003). The temporal lobes mature late in adolescence and have been associated with making inferences about the minds of others and knowledge about the social world (Figure 29).

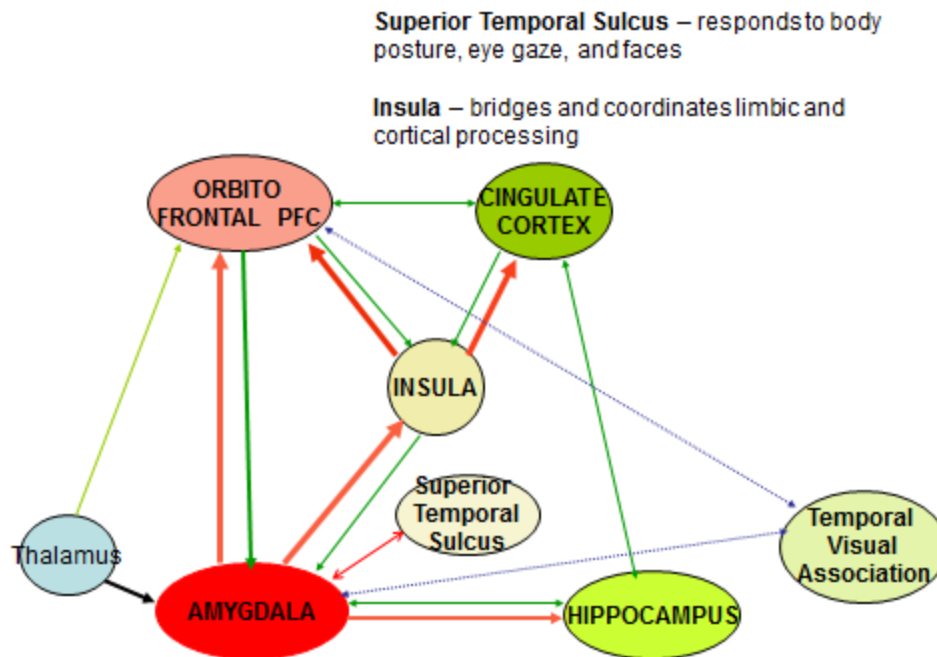


Figure 29 Neural connections of self-conscious emotions

Finally, during this period, an individual can experience the dynamism of positive maladjustment (conscious and selective rejection of some attitudes of one's social environment) when the dorso-lateral prefrontal cortex matures (Gogtay et al., 2004) and connects with the anterior cingulate region and orbito-frontal cortex, and then, through them, with the amygdala. Although, the amygdala does not have connections with the dorso-lateral prefrontal cortex, it does have connections with the anterior cingulate and orbito-frontal cortices. The connections within and between these three regions establish circuits that highlight the integrative functions of working memory. Positive maladjustment requires a strong knowledge of the self, developed social emotions, the ability to compare oneself with others, the ability for judgment and making decisions, and a sensitivity to feedback (Figure 30).

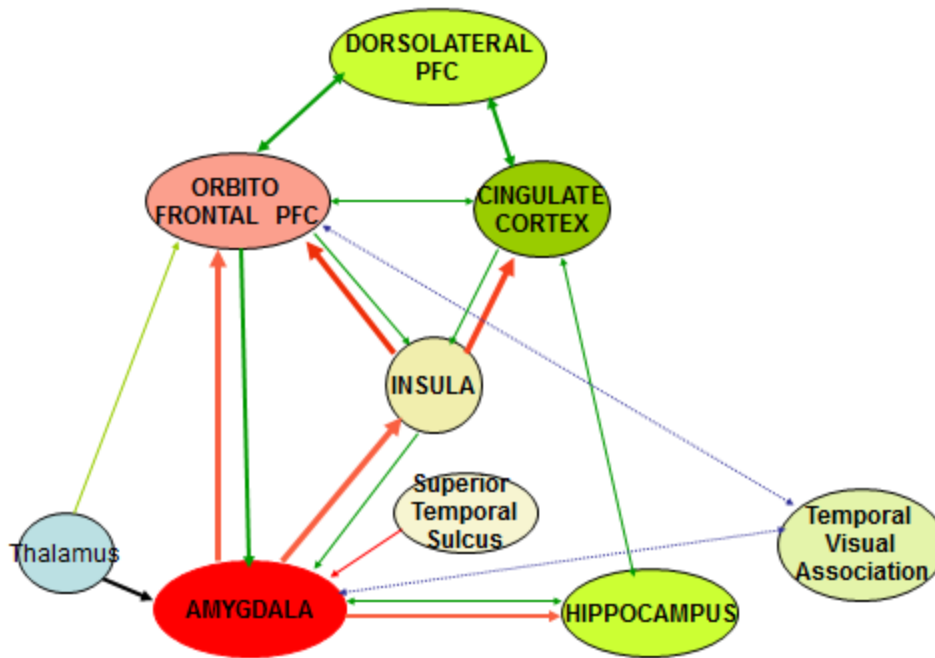


Figure 30 Neural connections of positive maladjustment

Brain of Late Adolescents and Young Adults

What seems to emerge during the transition from middle to late adolescence is a newly, more balanced integrated system of cognitive activity, a system that is increasingly under conscious control. During late adolescence and early adulthood, the brain continues to change. These developmental brain changes represent a process of selection and reorganization of neural networks with a goal of faster and more efficient information processing, which leads to increased integration among cortical areas and between cortical and subcritical structures (Cozolino, 2006). These connections evolve and stabilize based on the activities of the neurons themselves. Learning, positive experiences, and the formation of memories play major roles in the building up of connections (LeDoux, 2000; Siegel, 1999). Hence, cortical development truly is self-organizing (Lewis, 2005).

During this period, young people start to experience the emotion of empathy. Recent studies from a social-neuroscience perspective (Decety & Lamb, 2006; Decety & Jackson, 2006; Decety & Moriguchi, 2007) show that empathy is a complex phenomenon emerging from the flow and integration of information between specific circuits of the brain. The major functional components dynamically interacting with each other to generate the experience of empathy are: (1) emotion shared between the self and the other, based on the automatic perception-action coupling, (2) self-awareness, (3) a cognitive capacity to take the perspective of the other person, and (4) self-control and emotion regulation (Figure 31).

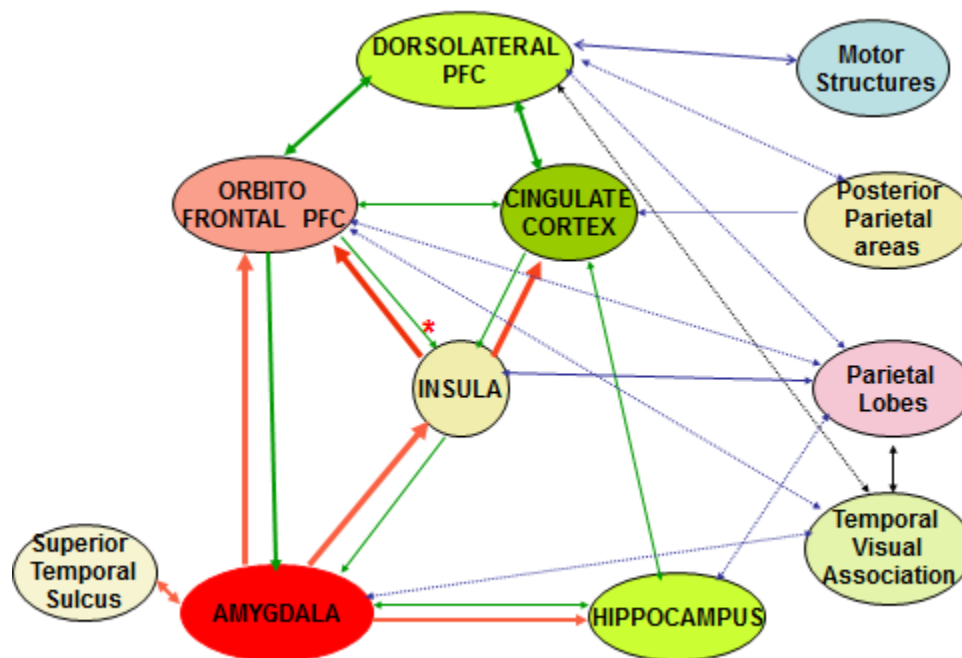


Figure 31 Neural connections of empathy

During this period of late adolescence and young adulthood, the neural connections to the cortex start to build up and more often the information about external stimuli goes from the thalamus to the cortex and then to the amygdala. This is the *high road* (long route) processing,

which allows for mindfulness, flexibility in the human responses, and an integrating sense of self-awareness. This form of processing involves the higher, rational, and reflective thoughts (Siegel & Hartzel, 2004; LeDoux, 1996). Creation of the self, social regulation, the ability to plan for the future, maturity of judgment and decision making, and the ability to integrate cognition and emotion are important skills that rely on numerous interconnecting neural subsystems that emerge during late adolescence. The period of adolescence may be understood as a transition from differentiated and local organization to the integrated and distributed organization of brain functioning.

CHAPTER SEVEN: METHODOLOGY

This chapter is presented in the form of a summary, as much of the content has already been discussed in detail in previous chapters. As such, this chapter begins with a short overview of ontology and epistemology. Following this, I discuss the philosophical perspectives of phenomenology and hermeneutic phenomenology and their impact on my research methodology.

Ontology and Epistemology

Ontology can be defined in many ways. From the philosophical (metaphysical) perspective, ontology is the study of the nature of being, existence, and reality. We can also understand ontology as a set of concepts within a domain of interest and the relationships between them. Ontology then provides its own vocabulary, which can be used to model that domain.

In qualitative studies we can create conceptual models, called pattern models (Cresswell, 1994). They are quite different from the deductive models of explanation, which are used by experimentalists. We look at these models as a map of concepts and their relationships in a form of meaningful organization. They serve as conceptual tools to enhance our functional understanding. The pattern models involve a number of phenomena, all of equal importance, and explain the connections between them. The models are fluid and constantly changing, evolving, and transforming, allowing us to have new relationships with the dynamics of studied phenomena. We have to remember that these models are only representations, reflections, symbols, or images, and not instances of reality itself.

Epistemology is the branch of philosophy that studies knowledge. It addresses questions such as, *What is knowledge? How is knowledge acquired? How do we know what we know?* Practically, these kinds of questions translate to issues of scientific methodology.

In chapter 2, I reviewed a variety of approaches to epistemology, from the epistemology of lived experience, existential-phenomenology epistemology, genetic epistemology, social constructionist epistemology, and finally the most complex approach, neurophenomenology.

Dilthey's epistemology is based on *lived experience*. Each human being has a Life and has, as a consequence, a complex set of lived experiences. This epistemological view is surprisingly simple and, at the same time, very meaningful.

Maurice Merleau-Ponty's approach can be called *existential-phenomenological epistemology*. His conception of the "lived body" proposes that the body is a living organism representing possibilities in the world. A person's intentional existence is lived through the body. As Merleau-Ponty noted, the organism both initiates and is shaped by its environment. He recognized that the organism and its environment are bound together in a reciprocal relationship. The lived body opens onto a world and allows that world to be for us.

Jean Piaget pioneered the idea that cognitive structures emerge from recurrent patterns ("circular reactions") of sensorimotor activity. He called his general framework *genetic epistemology* because he was primarily interested in how knowledge developed in the human organism as it progressed from an immature biological organism at birth to a being with abstract reasoning in adulthood.

Social constructionist epistemology derives from the work of Vygotsky. Under this approach, learning is considered to be a largely situation-specific and context-bound activity. Learners are believed to be immersed in their learning community, and to appropriate knowledge based on their existent understanding through interaction with their immediate learning environment.

Over the last fifty years, Husserl's phenomenology has been a very interesting topic for cognitive scientists such as Francisco Varela, who came to believe that it was necessary to

combine cognitive science with phenomenology in order to explain consciousness. Varela pointed out that consciousness cannot be explained by simply referring to the third-person perspective provided by cognitive neuroscience, since consciousness consists primarily of the first-person experience (Marchitelli, 2010).

Francisco Varela's epistemology, called *neurophenomenology*, includes the following three elements: embodiment (the human mind is not confined to the head, but extends throughout and even beyond the living body), emergence (human cognition emerges through self-organized processes that span and interconnect the brain, body, and environment in reciprocal loops of causation), and self-other co-determination (because open boundaries exist at all levels, which include the social, the individual human mind does not emerge in isolation, but instead is embedded within an interpersonal context) (Varela, Thompson, & Rosh, 1993; Marks-Tarlow & Martinez, 2001).

Husserl's Phenomenology

Husserl emphasized the importance of a direct study of phenomena as they appeared through consciousness. The main focus of his phenomenology lies in the concept of intentionality, which concerns the presence of consciousness in each experience. To clearly account for experience, without any reference to the factual empirical world, Husserl introduced a procedure called "bracketing." By bracketing, Husserl claimed to be able to study the intentional contents of the mind purely internally, without the influence of the external world. He called this experience the "intuition of essence." He tried to reduce experience to these essential structures and then show how our human world was generated from them (Husserl, 1969; Varela et al., 1993; Lavery, 2003).

Heidegger and Gadamer: Hermeneutic Phenomenology

A background overview of Heidegger's and Gadamer's hermeneutic phenomenology, which was reviewed in detail in Chapter 2, is briefly summarized below.

Essentially, hermeneutics in Heidegger's approach is the attempt to understand the phenomena of the world as they are presented to us, the attempt to understand how it is we go about understanding the world as it is presented to us, and the attempt to understand Being itself. For Gadamer, hermeneutic phenomenology investigates how people go about understanding the world in which they live. His interest is not in the structure of phenomena, but in how the phenomena are interpreted. In his view, interpretation should be the object of research (Gadamer, 1975/1989).

Methodology

These philosophies, as described above, influenced my research from ontological, epistemological and methodological perspectives. Husserl's reflection on the functioning of the mind and the way in which humans attribute meaning to experiences demands the epistemological approach. The hermeneutic phenomenology of Heidegger and Gadamer is essentially ontological because humankind participates in Being and Being has a structure that is capable of being apprehended and understood.

The differences between phenomenology and hermeneutic phenomenology are methodological. Phenomenological research is descriptive and focuses on the structure of experience—on the organizing principles that give form and meaning to the life world. Hermeneutic research is interpretive and concerned with the historical meanings of experience and their developmental and cumulative effects on individuals and social levels (Lavery, 2003).

In practical terms, the hermeneutic phenomenologist investigates how people interpret their lives and make meaning out of what they experience. Therefore, I have chosen hermeneutic phenomenology as the methodology for my research.

Methods

In my research on creativity and human development, I have used *narrative/biography methods*. The word method is used here as a way of knowing the world. The biographical method rests on individual's subjectively-gained knowledge and their understanding of their life experiences. Such understandings rest on an interpretive process that leads one to enter into the (emotional) life of another (Denzin, 1989). A life is lived on two levels, termed *the surface* and *the deep*. At the surface level, the person is what she does in everyday doings, routines, and daily tasks. At the deep level, the person is feeling her moral, sacred, and inner self. In my study, I was interested in the deep level of participants' experiences, such as their feelings, thoughts, memories, beliefs, decisions, spirituality, and especially their creativity.

Persons as selves have experiences. Experience refers to how realities of a life present themselves to consciousness (Bruner, 1986, p.6). Experience may be problematic, routine, or ritual-like. Problematic experiences are also called epiphanies, or moments of revelation, or turning-points in a person's life (Danzin, 1989). Experiences are given expression in a variety of ways. One of these means of expression is creativity, which gives rise to artworks, novels, films, scientific articles, drama performances, and more.

My research study was focused on the participants' own formative stories, situated in the broader context of their life. The aim of the first phase of my study was to listen, to reflect upon, and to record their stories about their lives and creativity.

I recruited volunteer participants from organizations that were in some way involved in the arts, such as secondary and post-secondary institutions that offer fine arts programs. The participants were informed about my study via email or poster-invitation. When contacted by interested individuals, I introduced myself, explained my background and interest in creativity, as well as the purpose and nature of my research.

Those seven individuals who were ultimately confirmed participants were further informed in detail about the nature and the purpose of the study, and were asked permission for their interviews to be recorded and transcribed. They also each received an explanatory letter and completed an Informed Consent form. Once they had a complete understanding of the research and their role in it, they completed the Participant Information Sheet, which gathered information about their current status as a high school or university student, highest educational level, age, interests, and artistic activities.

The First Interview

The participants were interviewed in-person for two hours, at a time and place of their choice, for the purpose of documenting their biographical stories and identifying their life-turning points (bifurcation points) with respect to their psychological development and the process of creativity in the context of their day-to-day lives. The first interview was typically conducted at each of the participants' studios, homes or schools.

The first interview was in the form of an interpretive conversation, and encouraged participants to reflect on their experiences in order to determine the deeper meanings of those experiences, particularly their feelings, thoughts, dreams, life choices, and memories. I began in

an open-ended way without asking specific questions. I also paid attention not only to what they “said,” but also to their silences, which I noted, tried not to disturb, and patiently waited out.

The first interview involved a questioning segment (broken up into shorter segments as appropriate), as well as demonstration and description segments, wherein the participants exhibited some of their creative products and the explained meanings they attached to those products.

The Second Interview

After I finished reviewing the transcripts from the first interview, I scheduled the second interview, during which each participant was first asked to read, review, and edit the biographical narrative written about them as a means of checking the accuracy of the researcher’s understanding of their life story/biography and interpretations.

Following the principles of hermeneutic phenomenology, I worked with the participants in an attempt to bring life to their experiences through the use of imagination and attention to language (Laverty, 2003). “Hermeneutic invites participants into an ongoing conversation...Understanding occurs through a fusion of horizons” (Koch, 1996, p.835).

Only through multiple stages of understanding and interpretation was I able to grasp the emerging patterns of the participants’ psychological development and their process of creativity. At the bottom of the interpretive hierarchy, I placed the participants’ “Life Story” as a simple presentation of data from the interviews. I call it the “iconic reference,” which includes landscapes or portraits of their lives. The next two stages of the interpretive process are the “indexical reference,” where, applying the theory of positive disintegration, I started to recognize, understand, and analyze the psychological development of participants. The fourth

stage contains a creative approach—the “symbolic reference.” I generated the pattern models of creativity by applying the idea of self-organization and the theories of emotions. These models are representations of the phenomenon of creativity. Finally, I included poems which represent the essence of the participants’ creativity and their lives. This is an integrated stage (Figure 32).

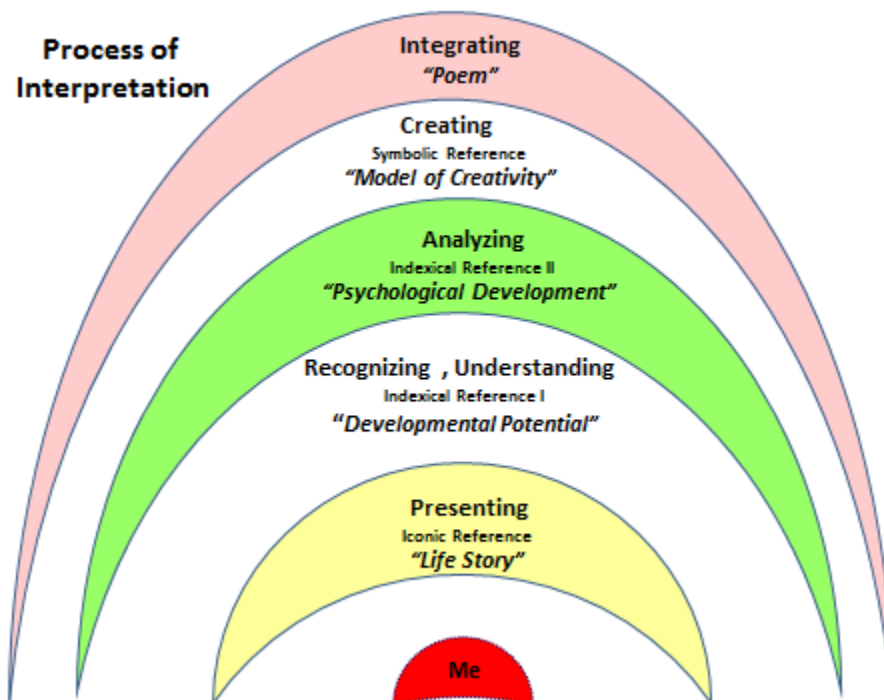


Figure 32 The Process of Interpretation

Follow-up Session

Within ninety days of closing the study, each participant attended a half-hour follow-up session, conducted either by phone or face-to-face. The follow-up session served four functions: 1) to ensure ethical guidelines have been met; 2) to discuss any educational benefits accruing from their participation; 3) to review the methodological process for potential revisions; 4) and to encourage a sense of satisfaction in contributing to educational research and society.

Participants

The aim in participant selection was to include participants who were involved in creative pursuits, who were willing to talk about their experiences, and whose contexts were diverse enough from one another to enhance the possibilities of rich and unique stories about individual lives and creativity.

All of the participants for the study were and continue to be actively involved in creative pursuits such as painting, installation, music composition, journaling, writing, and circus arts. Some of them were students of the Westmount Charter School, the Art Department of the University of Calgary, or the Alberta College of Art and Design, and others were independent artists.

All of the participants were treated in accordance with the ethical guidelines of the Conjoint Faculties Research Ethics Board at the University of Calgary. Prior to their participation in this study all participants were informed as to their rights and choices with respect to the protection of their privacy, confidentiality and consent. The identities of the participants were protected by means of self-selected pseudonyms to ensure confidentiality and privacy.

Role of the Researcher

A researcher's decisions around choosing phenomenology or hermeneutic phenomenology should be based on the understanding and good judgment of the subject matter. The use of this methodology requires the ability to be reflective, insightful and sensitive to language, and constantly open to experience (van Manen, 1997). The first step in this decision is for the researcher to begin a process of *self-reflection*. For the phenomenologist, the purpose of this reflection is to become aware of one's biases and assumptions in order to bracket them and to be

able to engage the experience without preconceived notions about what will be found in the investigation (Lavery, 2003). For the hermeneutic phenomenologists, the biases and assumptions are not bracketed, but rather are embedded and essential to interpretive process. Gadamer's "horizon" and "prejudices", which the researcher brings to a study, are influential in the research process, and require reflection. They constantly change historical and cultural products of understanding, which is why a reflective journal kept by the researcher is helpful in the process of reflection and interpretation.

In the section on Methodology in chapter 1, I discussed my beliefs and assumptions. My background in physics, especially complexity science, was crucial in the interpretation of the research data. In the process of data analysis in the hermeneutic phenomenology approach, not only is the background of the researcher important, but so is the use of imagination and attention to language and the writing process. To see something in a new and imaginative way is to see it differently from how it had been seen before, and to integrate it into a new semantic context (Madison, 1988).

In qualitative research, the researcher is often described as "the key instrument." This is because all the research methods associated with qualitative research are heavily dependent on the researcher as interviewer, observer, communicator, and interpreter of data.

Findings

The findings from this study will be presented and published in academic and popular publications, conference presentations, and professional workshops. This research will contribute to the theoretical knowledge about the process of creativity and its role in human development. I

hope that my study increases the awareness of educators and parents toward the importance of young persons' involvement in creative activities.

Summarizing the process of my research, I could simply say that I greatly enjoyed the whole process of talking to participants, as well as transcribing, analyzing and interpreting their interviews. I did not experience any problems during my research and was able to attract more participants than I had planned. No participant withdrew from the study. All participants were very open and keen to share with me their very personal and sometimes very traumatic experiences. They were very enthusiastic in showing their creative products, such as their paintings, drawings, musical compositions, diaries, and even acts of contortion. The atmosphere during the interviews felt like a conversation among friends who share a common interest and passion. I was very careful to build caring and trustful relationships with the participants while following the ethical guidelines.

CHAPTER EIGHT:

SEVEN PARTICIPANTS' DEVELOPMENT AND CREATIVITY

In this chapter, I present and interpret the creative lives of seven individuals representing a rich diversity in life experiences, psychological development, and interests.

They (all names are pseudonyms) are Stephannie, an artist and scuba diver; Krista Jennings, a contortionist; Eton, a spiritual artist; Marsha, a young writer; Jade, an artist and art teacher; Alasdair MacEwan, a young composer; and Anne Taklea, an artist and activist.

Stephannie – The Artist and Scuba-Diver

At the end of April of 2011, students at the Alberta College of Art and Design (ACAD) were preparing their Graduation Show by hanging their paintings and arranging installations. I was lucky enough to visit ACAD at that time and to invite some students to participate in my study. Two young women agreed enthusiastically and we scheduled the first interview. Stephannie was one of them.



If I hadn't been an artist...I would never have figured out who I am.

Stephannie

Stephannie graduated from the Alberta College of Art and Design in 2011. She received a Bachelor of Fine Arts degree with a major in painting. I met her at the college a few days before the graduation show. She was hanging up a large painting of an enormous, colorful octopus. Looking at this painting, I thought, *"This artist must love the underwater world."*

Stephannie agreed without hesitation to share her creative life with me. Shortly thereafter, I met her at her home, where she showed me several paintings. Most of them expressed the underwater world.

Life Story

Childhood

Stephannie grew up on a farm with a younger brother and an older sister. She felt very comfortable in the country side's wide open spaces. Together with her siblings, she was playful and imaginative, and often got herself into trouble venturing off where she shouldn't have gone.

But unfortunately,

My dad had an accident, and we spent a lot of time in the hospital with him. We were staying in my grandmother's house and she kept us busy by doing crafts with us. We were encouraged to do art activities. And when we went to school it was something we continued to do. We were definitely ahead in terms of talent.

Her family had to move to a new town and Stephannie felt like everything collapsed in her life. It was a really traumatic experience for her.

Stephannie started kindergarten when she was six years old. She recounts,

Everyone else was younger than me. It was kind of difficult. But I was really quick to make friends at this point. I did not understand the concept of what was cool or what was not cool. When I got to school, I started to be quieter because people did not want to be around me. They thought that I was weird. I got a lot of name calling and a lot of pushing. It was a really tough time.

She became very shy, and began to focus on her art and improving her drawing skills.

Between grades four and seven, I was the shiest I had ever been. I was quiet. It was like I was invisible. I had a few really good friends who appreciated me who I was, and everyone else did not matter because they did not treat me as a person. I was like in a bubble—I wanted to be safe.

Stephannie was a very good student. She had straight A's all the way through elementary and junior high school. But unfortunately, she had only a few supportive teachers who encouraged her art. During this time, Stephannie was very depressed and suffered from constant stomach pains. With some sadness in her voice, Stephannie says:

I loved school, but I hated people. From elementary school to junior high I did not have any chance to start over, because everyone who previously went to school with me were there again. They started to taint everyone else's thoughts: 'You don't have to be friends with her, she is weird.'

Adolescence

"But when I got to high school," Stephannie continues with a much lighter voice, "I started all over, because this was a huge school with a lot of new people. It was very intimidating. I could not stand crowds very much but I was able to overcome my fear of large groups of people. It got me out of my shell and I was able to prove, Ok, this is who I am."

Her school had a lot of different art programs that really helped her figure out what she wanted to do. At this point, she realized that she could do something with her art and keep going with it. She also met her future husband there, who was really supportive and helped her to push away that bad time. She felt much better and happier.

Young adulthood

After graduating from high school, Stephannie moved to a bigger city. It was a completely new experience for her. Just like in her childhood, she realized that she still did not like big cities.

I got into the art program but I wanted to be in photography at that point. I was very interested in photography. But it was a small art community so it was very hard to get into the photography program. So I took painting and drawing for the first two years.

After two years of the art program, Stephannie moved again. This time she moved to Calgary to study at the Alberta College of Art and Design.

It was so much better. Even I knew that I had to start over. I felt that it was a very important two years here because I learned how to grow as a person, creatively, and just to be more comfortable with myself and open up.

Artistic Practice – Everything Depends on Space

“My drawing teacher taught me: ‘Loosen up and you will feel looser and you will feel freer,’ Stephannie reveals. “And I started doing bigger stuff and I realized that it made me feel that I was not so closed in.”

At that time, Stephannie did not know that her artistic practice depended on the space where she worked. When Stephannie was working in a small room, she felt like she was suffocating and working on very small, really detailed pieces. But when she was working in a big auditorium with a lot of free space, she painted with her arms up almost as though she were flying or jumping around her painting.

“Everything depends on space,” she explains. “I did not know that at the time. I did not make that connection. It wasn’t until my third year at ACAD that I finally made this connection.”

During the third year of her studies, Stephannie started to figure out why she was obsessed with the gridding system and squares or boxes. *“Why was I obsessed with it?” she asks herself. “I was really fascinated with the cityscape and the structure of it. But at the same time, I really hate the city, so why am I fascinated with it?”*

Throughout the last semester, Stephannie was stuck in the studio with a group of colleagues who were taking over more and more of her space and spreading their stuff around the room.

I was spending less and less time there and my teacher said to me one day, 'Every time I come to see you, you are in the hallway wandering.' I said it's because I need to breathe. I would be painting for a while and then I would have to go for walk for five minutes just to be able to calm down. When I started, my painting would be really big, but then it would slowly get smaller and smaller and smaller.

Finally, Stephannie figured out that her obsession with these boxes (cityscape) was related to her desire to have her own space. She didn't feel comfortable in tight, small spaces: *"When I get into a crowd of people cruising around me, I feel like I am suffocating. Drawing or distracting myself with art was a way of coping with my space,"* Stephannie reveals.

Scuba Diving Experience

One day, encouraged by her future husband, Stephannie tried scuba diving. And it was OH!—

This is where I need to be. It just was very quiet, really calm. I could focus on my breathing. In the right conditions you can see everything around you. It is an infinite space. This is where I need to be. It was really funny. When I was scuba diving for the first time I really loved it, and when I came back up to the surface I was like...Ah...I don't want to be here. I want to be back down there.

This is why a lot of scuba diving experiences started filtering into her paintings. She really loved it. She started creating paintings of anemones (underwater flowers). She tried to compare two different types of spaces: really structured busy urban spaces, and really organic calm underwater spaces.



Personal Growth versus Artistic Growth

Stephannie states that being an artist gave her an opportunity to figure out who she was and why she was so frustrated with herself. *“I have been living with this claustrophobia my whole life but I did not figure out how bad it was until I got here,”* she says.

She finally realized that her physical reaction to space was part of a mental condition as well.

I was obsessed with something but I was scared at the same time. Through working, working through my art and through those ideas, I began to understand what I was going through and to cope with it by reversing it a little bit—because I am not so bad anymore.

Psychological Development

To analyze Stephannie’s psychological development, I linked Dabrowski’s theory of positive disintegration with the affect-spectrum theory and the idea of self-organization.

Developmental Potential

Stephanie's developmental potential is characterized by enhanced emotional, intellectual and imaginal overexcitability and artistic talent.

The signs of Stephanie's emotional overexcitability are:

- Excessive shyness (*"I became very, very shy. I did not talk to anyone. I just focused on my art. I was quiet."*)
- Depression (*"I was very depressed. I loved school but I hated people."*)
- Exclusive relationships (*"I had a few really good friends...and everyone else did not matter because they did not treat me as a person."*)
- Difficulties of adjustment in a new environment.

Emotions during Childhood and Early Adolescence

Stephanie as a child was very happy and cheerful but when she moved to a city and started her schooling at a primary and junior high school, she changed radically into a quiet and almost invisible child. She became very unhappy and depressed. During that time Stephanie was rejected and treated badly by her classmates and most of her teachers. Because of *rejection* and *sadness*, she experienced *loneliness* and *misery*. Fortunately, she had the ability to cope positively with these difficulties. She felt intuitively that fighting with these people was pointless and a waste of her energy. Stephanie withdrew from this brutal external environment into her own internal world. She hid in her "bubble." She retreated to and took refuge in her imagination and creativity. She just focused on her art. But she also had a few close friends who accepted her for who she was. These positive emotions of *acceptance*, *friendliness*, and *interest in art* became the necessary forces for resistance against these strong difficulties in the external environment (Figure 33 & 34).

Pattern of emotions of Stephannie during primary & junior high school

Secondary Emotions

Friendliness = joy & acceptance

Optimism = interest & joy

Resourcefulness = interest & acceptance

Submissiveness = acceptance & fear

Anxiety = interest & fear

Misery, Loneliness = sadness & rejection

Hate = rejection & fear

Embarrassment (shame and shyness) = fear & sadness



Figure 33 Emotions of Stephannie during her childhood and early adolescence.

Pattern of emotions during primary and junior high school

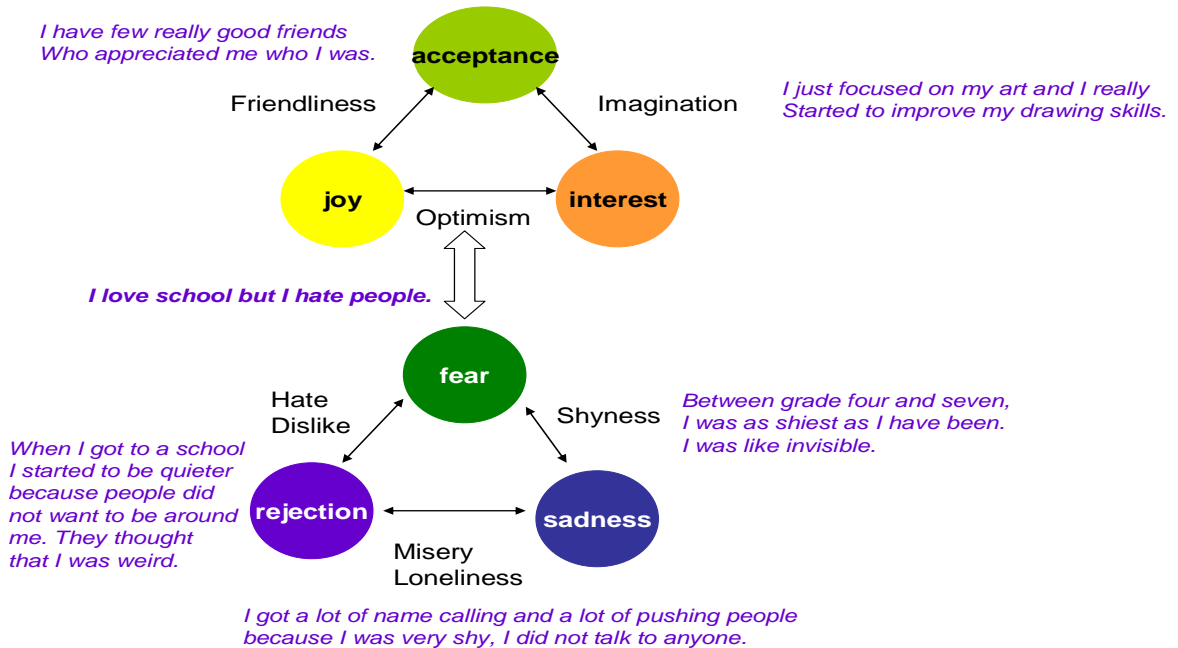


Figure 34 Pattern of emotions of Stephannie during childhood and early adolescence

Adolescence

In high school, Stephanie felt really fortunate. People who bullied her in junior high disappeared. Her “bubble” burst and she was able to freely show her personality. She “opened” herself to the inner and external world. She made a lot of friends, and fell in love with her future husband. She was also continuing and developing her artistic interest. She was still afraid of crowded places but was able to overcome that fear (Figure 35).

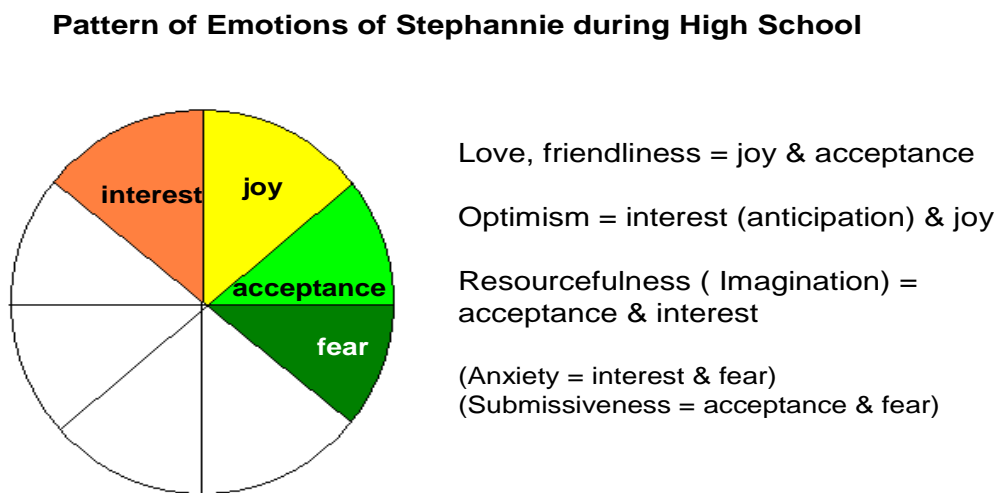


Figure 35 Emotions of Stephanie during middle adolescence

Young Adulthood – The Organized Multilevel Disintegration

During university, Stephanie continued to grow as a creative person and to be more comfortable with herself. As a result of artistic practice and self-observation, she began to understand her obsession with open spaces and learned how to deal with it.

Stephanie also developed an enormous fascination with scuba diving and experiencing the underwater environment, which became her inspiration for many artistic projects.

During this time, her psychological state can be described by the fourth level of the theory of positive disintegration—the organized multilevel development that is characterized by lesser

tension and a greater ability to systemize experiences. Stephannie focused on her future and personal goals. She found the interest and passion in art that became her profession.

Pattern of Emotions of Stephannie during the University Time

Secondary Emotions

Love, friendliness = joy & acceptance
 Curiosity = acceptance & surprise
 Optimism = interest (anticipation) & joy
 Delight = surprise & joy
 Resourcefulness (Imagination) = acceptance & interest
 Anxiety = interest (anticipation) & fear
 Submissiveness = acceptance & fear

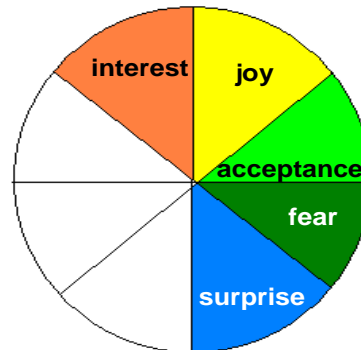


Figure 36 Emotions of Stephannie during young adulthood.

Discovering the underwater life was an enormous *surprise* and revelation for Stephannie. Surprise linked with joy creates *delight*, surprise and acceptance creates *curiosity*, and joy and acceptance creates *love*. During scuba diving experiences, Stephannie felt these secondary emotions (delight, curiosity, and love), which opened her to new experiences and challenges. During the summer of 2011, she was taking a course on advanced scuba diving in deep mountain lakes. Her curiosity toward the underwater life linked with her interest for exploration, evoked in her a sense of *fascination* and also provided *inspiration* for her artistic projects. Stephannie totally *accepted* this underwater world (Figure 36). Multiple occurrences of emotions like joy, interest/anticipation, and acceptance may lead to the integration and stabilization of her emotional-cognitive structure and finally to the formation of her personality traits. Stephannie

becomes a *resourceful*, *optimistic* and *sanguine* person. She becomes a highly creative person with a positive self-image, excited about new challenges (Figure 37).

Emotional Pattern as Higher-Level System

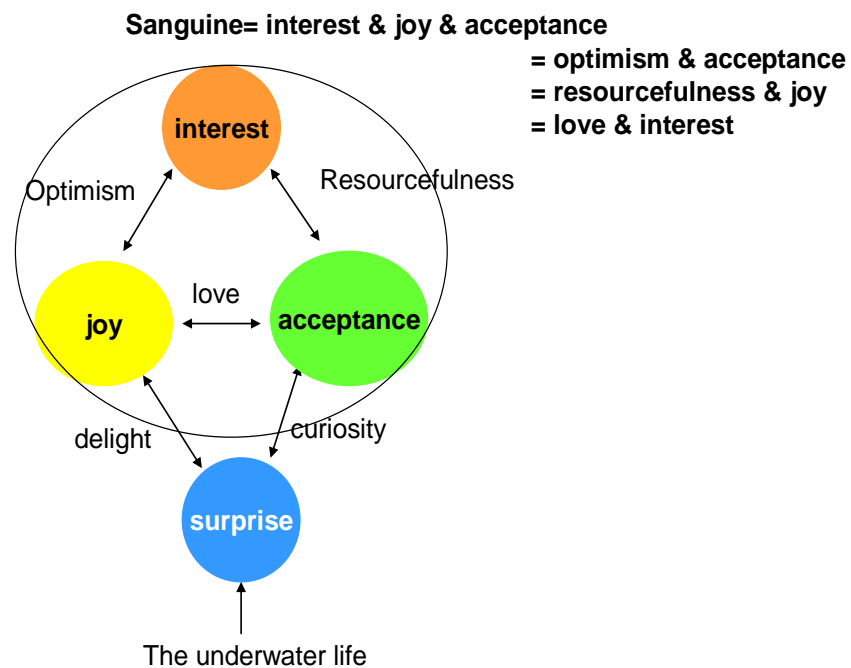


Figure 37 Emotional pattern of Stephannie during her young adulthood



Pattern Model of Creativity

In this section, the pattern model of Stephannie's creativity is presented by applying the affect-spectrum theory and the idea of self-organization.

Preparation – Anticipation

Stephannie started her recent project a few months in advance:

"I am going diving and I am taking photos when I am diving. I try to remember through these photos what I was experiencing at the time," she describes.

She is trying to evoke mental images and feelings from her underwater experiences. Stephannie's artistic process involves a lot of experimentation, and she often does not know how it is going to turn out:

“Sometimes I have a sketch on the canvas and start from there. At another time I try different things with this same image. I use this image multiple times in different ways to see if it creates different feelings.”

Her emotional state during this preparation phase can be described by the emotion of *anticipation*.

Starting - Expectation

Her favorite part of her creative process is the starting point:

“There is nothing like seeing a blank canvas and just sketching my idea and looking closely at what I already want to paint. This is a sketch. It is really good feeling.”

So, I assume that this good feeling for Stephannie is a complex emotion of *anticipation* linking with *joy* that creates a feeling of *expectancy or keenness*.

For Stephanie, the best method is to start painting and working on it in one shot while her feelings toward the idea are still there. If she starts it later and her feelings are different or not right, she says she can wreck her painting.

That happened with her octopus painting, which I saw at the graduation show. She says:

I started it a while ago but I had to leave it because I didn't have time to finish it that day. I came back to it later and tried to paint but it was not working. I waited and waited and finally during one weekend I felt a certain way. I thought, Yes, I can work right now, and I got back into it and it worked out perfectly.

Stephannie needs right feelings, right memory, and right thoughts in order to keep the continuity of painting.

Differentiation - Acceptance

Usually, half way through the process Stephannie has to be really patient. During this phase, there are many separate details that have to come together. This process is very demanding. She has to really immerse herself and believe in the process. Here, Stephannie begins to *accept* her yet unfinished product.

Integration - Satisfaction

Near to the end, she has to be there to put all the pieces together.

“Ok. It will be done soon and I just see it, Stephannie expresses with enthusiasm. “Yes, I am so happy and I am practically jumping around. Oh it looks so great. It looks so good. It makes me feel so good.”

During this final phase, Stephannie feels *delight, satisfaction, and happiness*. Here there are complex emotions of *joy* combining with *surprise*.

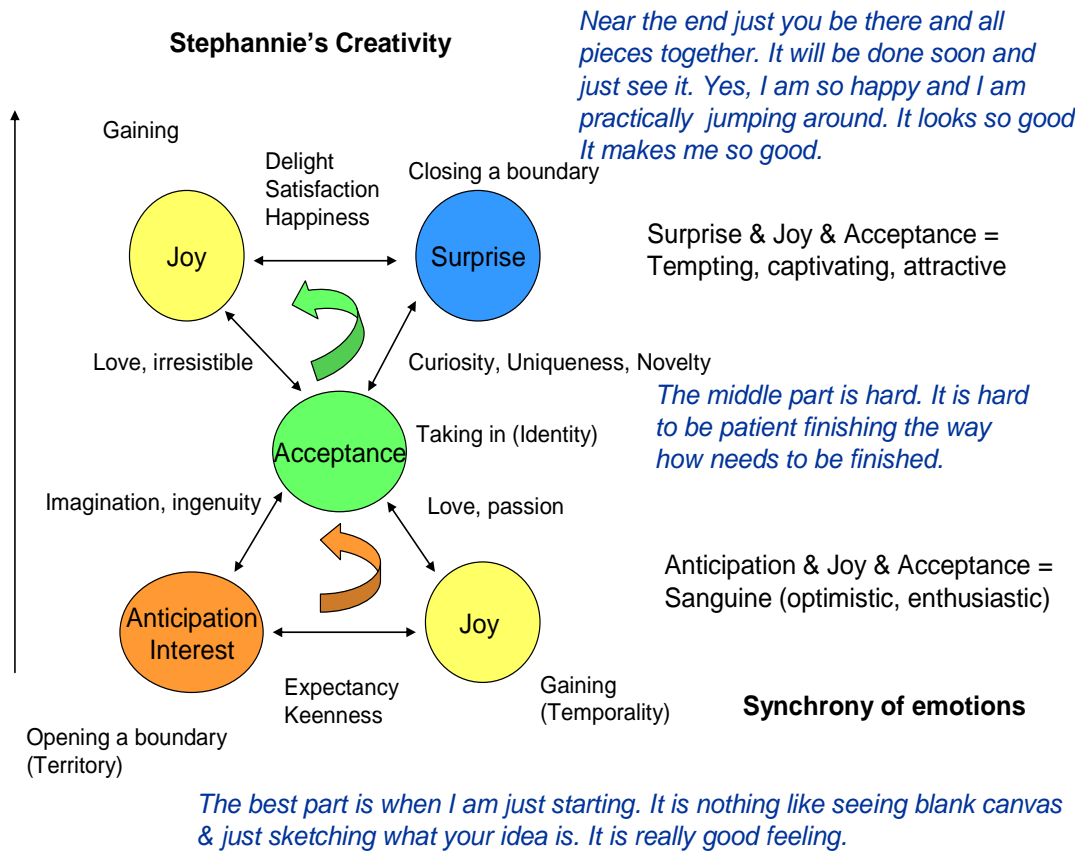


Figure 38 Pattern model of Stephannie's creativity



“The best moment is the beginning and close to the end,” says Stephannie.

In the pattern model of Stephannie’s creativity, *anticipation* “opens a boundary” of this process at the starting point and, combining with *joy*, creates a good feeling of *expectancy* and *keenness*. At the end, *surprise* “closes a boundary” of this process and combines with *joy* to create a great feeling of *delight* and *satisfaction* (Figure 38).

At the end of this section on Stephannie’s development and creativity, I include a poem that was rearranged from my interview with her.

I am not so bad anymore

If I hadn’t been an artist and I hadn’t been working the way I was

I would not have figured out who I was

I would be frustrated the way I was

*I would not understand still why
I have been living with this claustrophobia all my whole life
I did not figure out how bad it was until I got there.*

*It was a physical reaction but I did not realize what it was.
And finally I realized that it was as mental as physical.
I was obsessed with something but I was scared at the same time.*

*That working through my art, through my ideas
I am going through and coping with what I was going through
And I reverse a little bit, because I am not so bad anymore.*



Krista Jennings – the Contortionist



*“I feel that it is something that I love doing,
that I am passionate about
And that I am able to share with others”*

Krista Jennings

For the interview, Krista Jennings invited me to her home. She has just turned eighteen and with a smile she comments that the consent letter for this interview will be the first document she can sign by herself.

Krista graduated from Westmount Charter School. She mentions before the interview that she is very intrigued by the topic of my dissertation and, with great enthusiasm, says she would like to be a part of it.

Psychological Development

To analyze Krista's psychological development, I combined Dabrowski's theory of positive disintegration with chaos theory and the affect-spectrum theory.

Developmental Potential

Social factor

Krista was born in Germany. During her childhood her family moved a lot. They lived for two years in Germany, then they moved to England for two years and then to Vancouver for three years before finally ending up in Calgary.

Krista says:

Some might say that I had a turbulent childhood from moving around so often. But I don't quite see it this way because I do feel very fortunate that I had a chance to travel, and at each place my mom was always at home with us.

Krista has a great relationship with her mother, who acts as a mentor, an adviser, and a spiritual guide for Krista. Her mother inspires her and guides her.

Emotional overexcitability

From childhood Krista shows strong indicators of emotional overexcitability:

"I was a very happy child," Krista says. "I smiled quite a bit. But I also know that I got very nervous and anxious at times, but people did not see it often because I was usually smiling."

She was also a very sensitive child. She says, *"When I was in the room with somebody else, I could feel if that person was upset or happy. I have always been very sensitive."*

Within the three weeks following the interview, Krista will be moving to Montreal to start studying at the National Circus School.

I am very excited, and as it gets closer I get much more nervous because I am sure that I will be home sick. I will be living in residence—that's why I have a lot of anxiety about going.

She has always been prone to anxiety. When she was five years old, she had her first spelling test and was so nervous that she had a stomach ache. Her mother was very concerned that it was something serious and took her to see a doctor, but it was only stress.

Intellectual overexcitability

Krista also has a strong intellectual overexcitability. She says:

Sometimes I almost want to turn off a little bit because my mind is constantly racing. So I started keeping a notebook with me—even when I train downstairs I have a little whiteboard. I am always writing things down because I find that sometimes I have trouble sleeping at night.

She is always thinking ahead and planning for the next days. In that way she is very well organized.

Imaginational overexcitability

The best method of learning for Krista is through the arts: “*This is how I understand things—when I can draw and create some sort of analogy that helps me to remember and describe,*” she explains.

Psychomotor overexcitability

From a very early age, Krista showed an enormous psychomotor overexcitability. She says,

I have always been, you can say, creative, or enjoyed doing creative things by hand, always making things, and busy. I was always busy running around the house. I used to be a sprinter, so I was running track and field.

When she was eleven years old, she fell in love with the circus. She started training on her own a few hours each week and became a contortionist and a hand balancer.

Psycho-motor combined with emotional, intellectual and imaginal overexcitability

Being a contortionist, Krista has to train extensively—two to three hours every day. It requires a lot of discipline and dedication, but to Krista it does not feel like work. She loves learning, and contortion for her is not merely a sport but an art form.

Krista prepares her pieces by herself:

It is always a challenge to develop a concept for the act and truly convey a lot of emotions. It is a challenge because I sometimes feel that I meet a dead end and I don't know where to go. Then I feel that I've done too much with the conceptual part and now I need to start actually physically going through the movements if the piece is going to take shape.

To do this, Krista has to be equipped with four forms of overexcitability: intellectual (creating a concept for the piece), emotional (expressing emotions), imaginal (drawing inspiration from some visual forms) and psychomotor (performing actual movements).

Bifurcation Points

When we think of ourselves as complex systems, bifurcation points can be viewed as special events along the flow of our lives during which choices can be made to influence future possibilities.

Falling in Love with the Circus

When Krista was eleven years old, her dad took her to the Cirque du Soleil production “Alegría.” While watching the circus acts, she was extremely excited and already contorting. *“I just fell in love with the circus. I was amazed by what the human body is capable doing. I was completely in awe,”* Krista says. From that moment on, she decided to start training on her own (Figure 39).

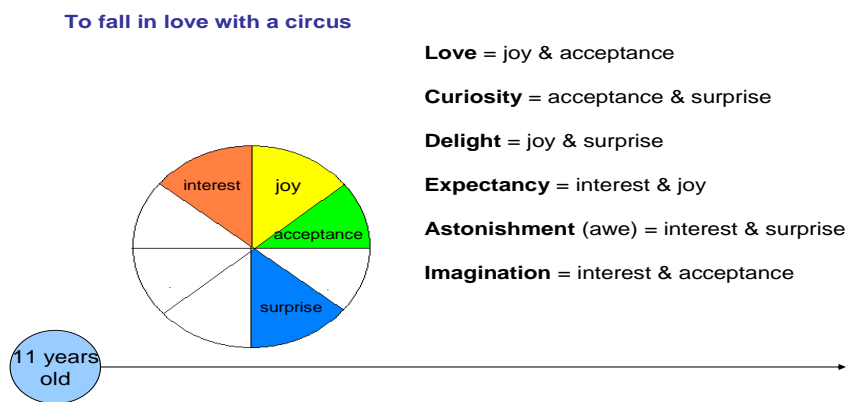


Figure 39 Emotions during Krista’s childhood

Period of injury

When Krista was almost fifteen, she experienced a very difficult and scary period. Because of her injury, she was not able to do what she loved to do and what gave her so much joy. She had to make some choices. Before her injury, she was a sprinter and a contortionist as well. With contortion the body becomes very flexible, but with running the body is exposed to frequent

impacts. So there was a period when she was not doing either. She was seeing physiotherapists, but nobody knew how to help her.

“It took some time to heal from my injury and also to learn how to train smarter, and really to learn about how to go through these movements without having the pain,” Krista says.

During that time, she also switched to another high school and had to catch up with academic material and make new friends. It was overwhelming for her.

“But at the same time I put a lot of effort in the things that I was doing and had a lot of support from my teachers, and especially from my family too,” Krista recounts. *“I was just getting through that period.”*

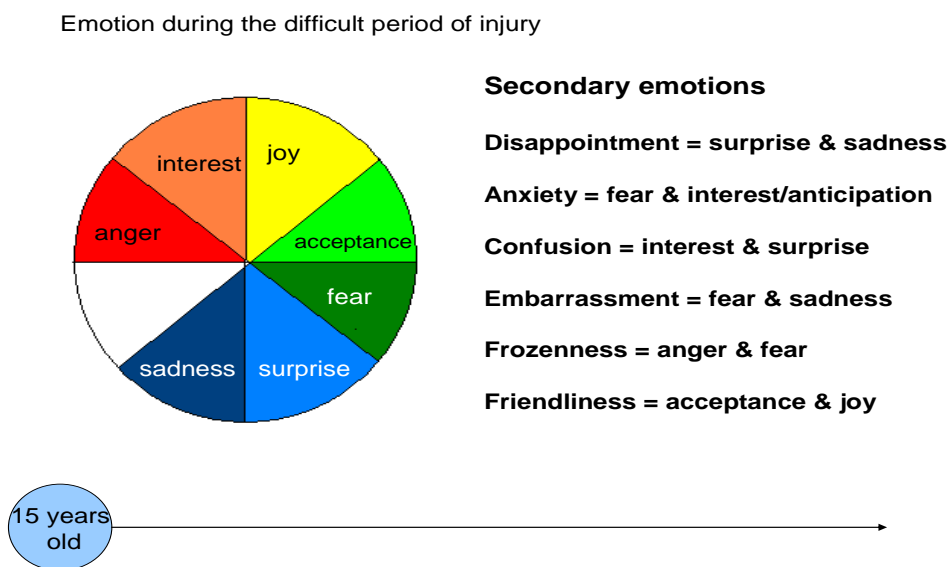


Figure 40 Emotions during Krista’s injury

During this difficult period, Krista experienced a variety of emotions, like *sadness / distress*, *disappointment*, *dissatisfaction with oneself*, *fear*, *anger*, *anxiety*, but also *acceptance* and *friendliness* (Figure 40).

In Krista's state, the emotion of sadness had a very important function in motivating her to do what was necessary in order to reduce her sadness. She patiently waited for her injury to heal and learned to train more wisely. During this time, Krista felt a strong disappointment (distress & surprise) and frustration (surprise & anger) knowing that she could not do what she really desired to do. She feared that she would never again be able to run, nor perform contortions (Figure 41).

Distress provides “**negative motivation**” that is not too toxic or too intolerable. To some degree “negative motivation” is necessary to make us responsible to our problems.

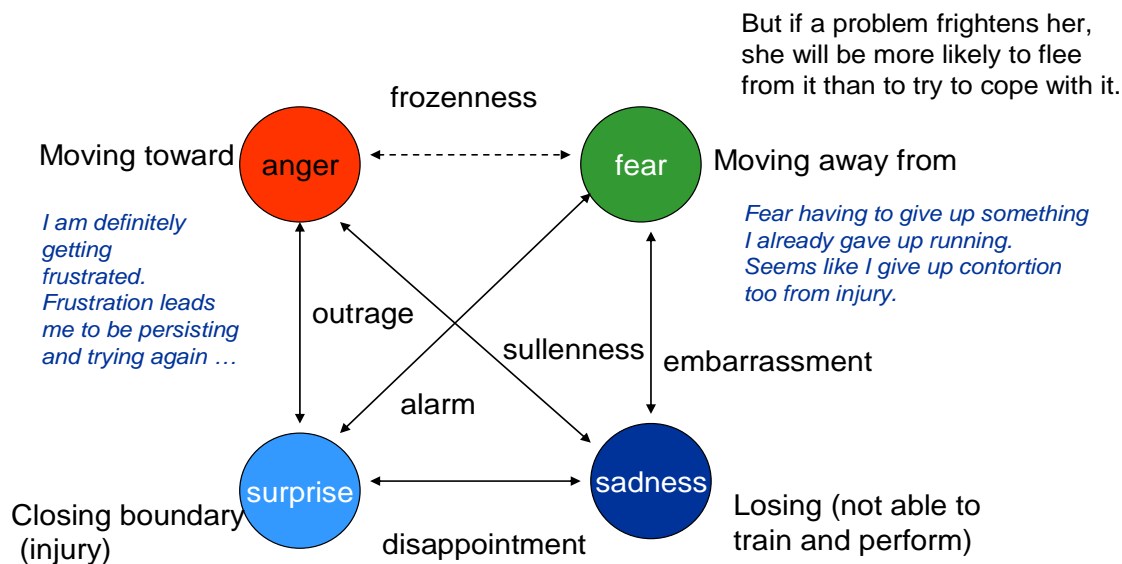


Figure 41 Emotional pattern during Krista's injury

In the complex system of emotions—such as sadness, surprise, fear, and anger—anger was a very important emotion for Krista. Krista’s anger was responsible for her persistence and the continuation of her training. She says, “*I was definitely getting frustrated. Frustration leads me to be persistent and to try again, and again.*” But if her fear was stronger than her anger, it is likely that she would have quit her training. Krista shares with me, “*I do have a lot of fear of being injured and not being able to do what I love. This is the fear of having to give up.*” At the time of her injury, Krista was constantly fighting between anger and fear.

Fortunately, her family and teachers were very supportive and helpful, and she was able to overcome this difficult period. Most importantly, she felt *accepted*, *loved*, and *optimistic*. She also showed strong *resourcefulness* (acceptance & interest) in coping with her injury, and in her much smarter training as she learned how to go through the movements without having the pain (Figure 42).

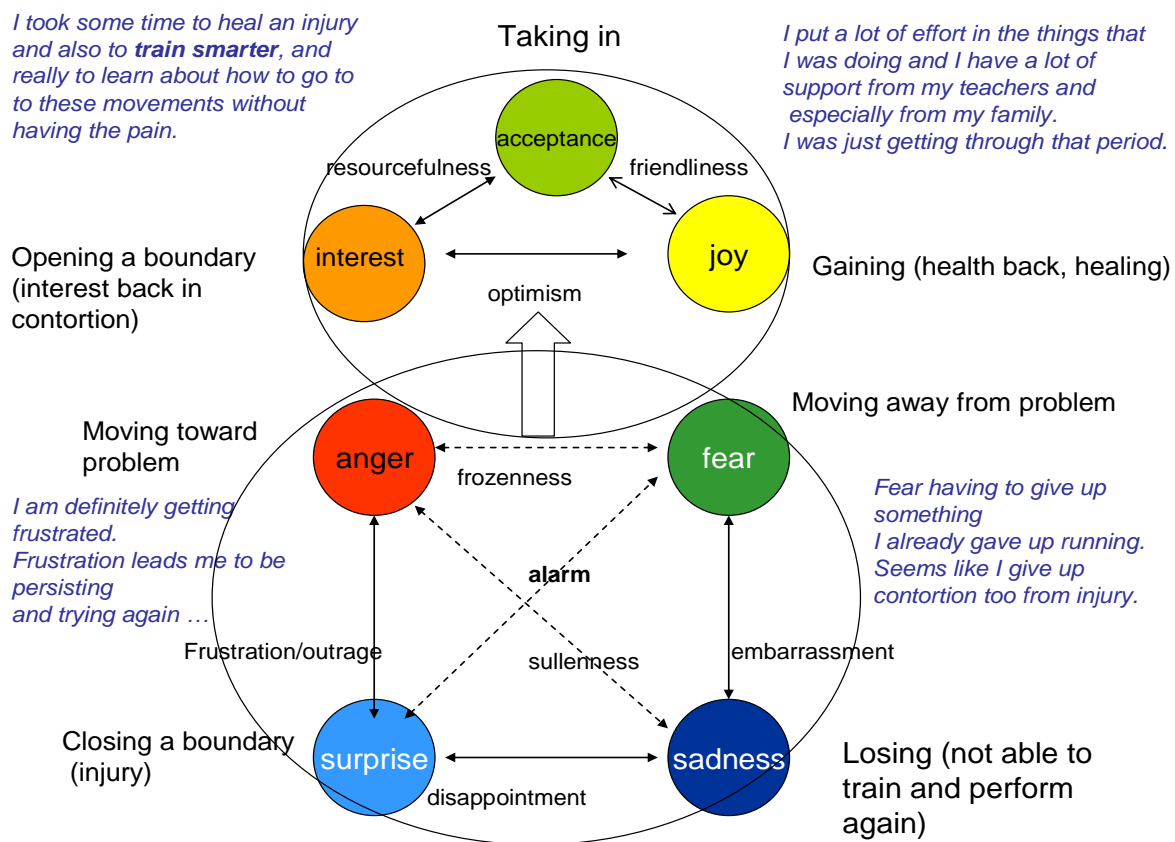


Figure 42 Emotional pattern during Krista's period of injury and healing

Decision to be a Contortionist

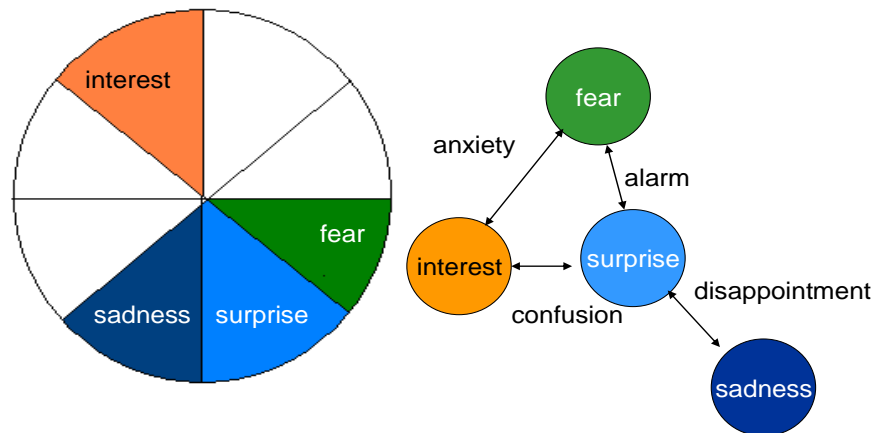
Finally Krista had to make an important life decision. She decided to continue contorting and quit running because the circus art gave her more fulfillment.

She also mentions that she was always very disappointed or frustrated with her accomplishments. But she says:

I try to learn how to cope with it and deal with it in a more positive way.... My mom actually does meditation, and she offers me some suggestions on how to empty my mind. I am more in my mind, probably more than in my body.

During her middle adolescence, Krista experienced dynamisms from the third level of psychological development, the *spontaneous multilevel disintegration*. The dynamisms of *dissatisfaction with oneself* (anticipation & surprise & fear & sadness) (Figure 43) and *frustration with oneself* (anticipation & surprise & fear & sadness & anger) (Figure 44) were especially strong. These dynamisms were essential for her psychological development by creating a state of self-observation, self-criticism, and self-awareness, and helped her to make decisions that were significant toward her future professional life.

Dissatisfaction with oneself - critical, condemning attitude toward oneself accompanied by state of anxiety and depression



*I am always so **disappointed** when I don't do well on the exam.
I have this **strong drive** and I try to **learn how to cope** with it and deal with
the more positive.*

Figure 43 Dynamism of dissatisfaction with oneself

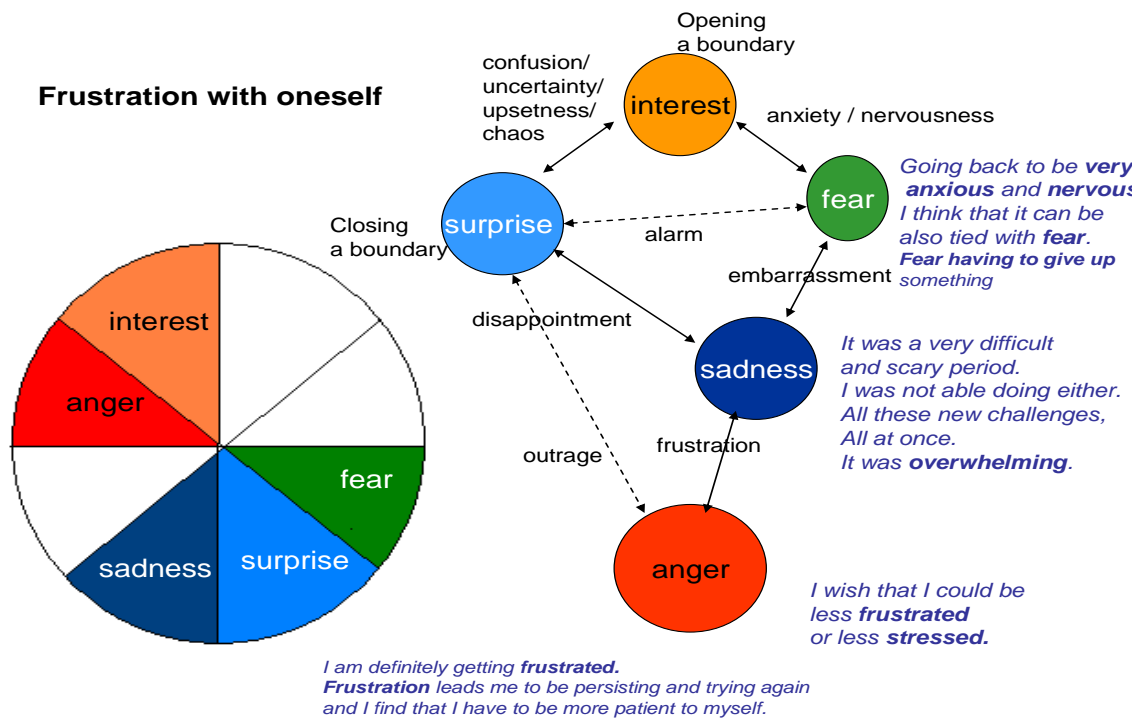


Figure 44 Dynamism of frustration with oneself

Decision to Study at the National Circus School

After graduating high school, Krista decided to study at the National Circus School in Montreal. She had to go through a grueling four-day audition. She was the youngest among students from around the world. On the first day of the audition, half of the enrollees were cut. The roster went from 267 to 67, and each day more people were eliminated.

“So it was already very stressful,” Krista says, “but the day before the audition they told us that our act needs to be three minutes, no longer. I had to make quick changes to my act because it was a little bit too long.”

“Of course it was again an excitement to show what I was working on and what I am very passionate about, but also very stressful,” she continues. “And I had it in my mind that it couldn’t go any other way. It had to be perfect.”

Fortunately, it went very well. Krista was accepted and in August she will begin studying at the school.

In deciding to study at the National Circus School, Krista has completely committed herself to her passion. She approaches the fourth level of development—the organized multilevel disintegration. Krista is focused on her future and personal and professional goals. Her new dynamisms are stabilizing and organizing her mental structure. The main dynamism involved in this process is creativity.

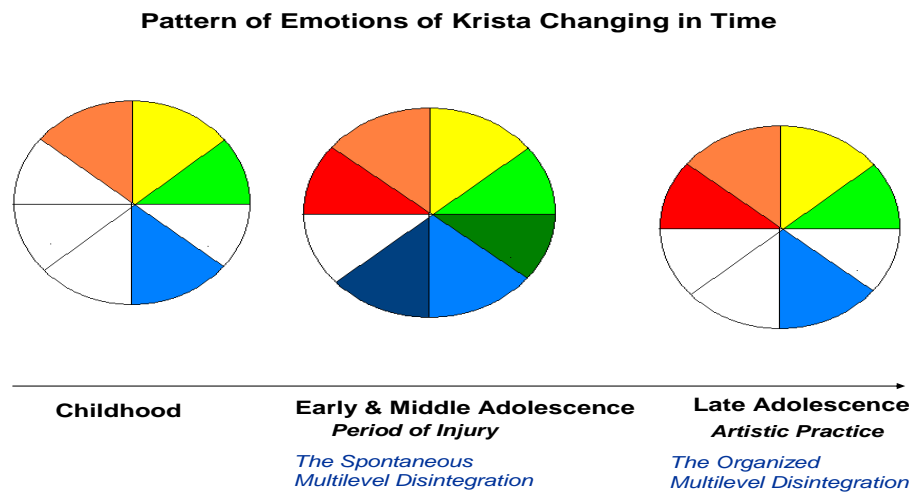


Figure 45 Patterns of emotions from childhood to late adolescence

In the next section, Krista's process of creativity is discussed by applying the idea of self-organization.



Self-Organization of Creativity

Chaos – The Differentiation Phase

With great enthusiasm, Krista shares with me how she creates her performance pieces.

It is usually some little spark of inspiration, whether it is a piece of music or some words, or very often something visual or something that I can hear,” she shares.

“And from there, then I start to have ideas. Like I said, yes it’s usually in my head and I end up writing it down and doing a lot of research.

And eventually she gathers more and more ideas and concepts. It is very important for Krista to understand what she is doing. However, for the audience the message does not need to be completely clear. She comments: *“Each audience member sees something different and they complete the performance.”*

For example, when Krista was preparing the piece for her audition at the National Circus School, her starting point was the painting of the seventeenth-century painter Johannes Vermeer, *Girl with a Pearl Earring*.

“Ever since I was little I was drawn to this painting,” Krista shares. “It stirs my imagination. It is so mysterious. At the same time I have a feeling that I can’t describe when I see it.”

Krista read the novel and watched the film of the same name:

“I enjoyed the novel and the film as well. And there is a piece of music [in the film] I played over and over in my mind, so I decided to use it for my act.”

Emotions

The main emotions during this stage of her creativity are *interest, joy* and *acceptance*.

Interest, fascination, inspiration are emotions which open up a boundary of various experiences. Interest is evoked by the perception of novelties emerging outside of one’s self or from within (imaging, memory or thinking). Krista is captivated by the painting *Girl with a Pearl Earring*. It holds her attention and maintains her focal awareness.

Joy motivates individuals to approach challenges and to keep working. People experiencing joy are more imaginative and creative. Krista is really enjoying working on her pieces by researching, reading a novel and watching a film.

Acceptance means being receptive to a joy-producing object. Krista accepts the process by becoming immersed in it and then allowing any ideas to come to her mind.

In this stage, Krista becomes “open” and “receptive” to her external and internal environment. She becomes a participant and an observer of the ongoing process of experience. These three emotions—interest, joy, and acceptance—create the state of openness and receptivity that allows her creativity to emerge.

These emotions are also components of the “Subject-Object” in oneself dynamism which allows for critical self-observation and self-evaluation. This dynamism permits Krista to open

her own psyche for observation (anticipation). Through observation and analysis, Krista gains knowledge of herself (acceptance):

I have this strong drive and I try to learn how to cope with it and deal with it in a more positive way.... [My] frustration leads me to be persistent and to try again.... I find that I have to be more patient to myself.

Bifurcation Point

Through the process of researching, collecting ideas, exchanging information, and combining with emotions, Krista pushes her mind to a far-from-equilibrium state. In this state her mind as a complex system is extremely sensitive to small perturbations. The piece of music that she hears in the film becomes this small perturbation that changes her state of mind. She bifurcates from one state (attractor) to another by making a decision which has an influence on her further creative process.

This piece of music appears as a *surprise* for Krista. It begins with her sudden *attention* or *interest*, which then changes into *astonishment*. She had been playing this piece of music over and over again in her mind, so she decided to use it for her act.

Complexity – The Integration Phase

After the music was chosen, Krista spent almost five months allowing ideas to come to her mind. She said, *"Sometimes I almost want to turn off for a little bit because my mind is constantly racing."* She started keeping a notebook and writing things down because she had trouble sleeping at night without this outlet. She desperately wanted to evoke some special emotions.

"Actually, I realized that I spent more time on the concept than I did on the movement," Krista says. *"After about five months I realized that I have to start working on the movement because this is an act that I will be performing."*

Quite often, at the end of this stage Krista has too many ideas and has to eliminate some of them if they don't fit the concrete piece. Sometimes she tries to work with them but usually they don't match. And finally she has to let them go or visit them later instead of trying to cram everything into one piece.

Complex Emotions

During this time, all mental elements are self-organizing into new, unexpected patterns. For example, emotions evoked in the first stage (like interest, joy, acceptance, and surprise), by connecting with each other, create complex secondary emotions that are extremely essential to the process of creativity.

Interest combined with acceptance creates *resourcefulness*, which entails excitement in the face of mental challenges. It has a substantial cognitive element as it involves thoughtfulness in efforts to overcome obstacles. It is also important for managing stress and anxiety (TenHouten, 2009). Acceptance joined with surprise creates *curiosity*, which reflects a person's efforts to maintain an optimal level of mental arousal, contributing to task-persistence (TenHouten, 2009). Joy, together with interest, creates a secondary emotion like *enthusiasm*, *eagerness*, or *optimism*. Joy combined with acceptance creates *love*, *passion* and *keenness*, and, finally, joy connected with surprise creates *delight*.

Krista experiences these complex emotions not only when she works on her pieces, but also later when she performs them (Figure 46).

After spending almost five months on the concept for her piece, Krista realizes that it is time to start working on the movements:

“I have to get out of my head and get into my body,” Krista explains. “And for a little while I have to turn off my brain and all the ideas and just allow my body to move. I just turn on music and just whatever comes to my body...just allow that to happen.”

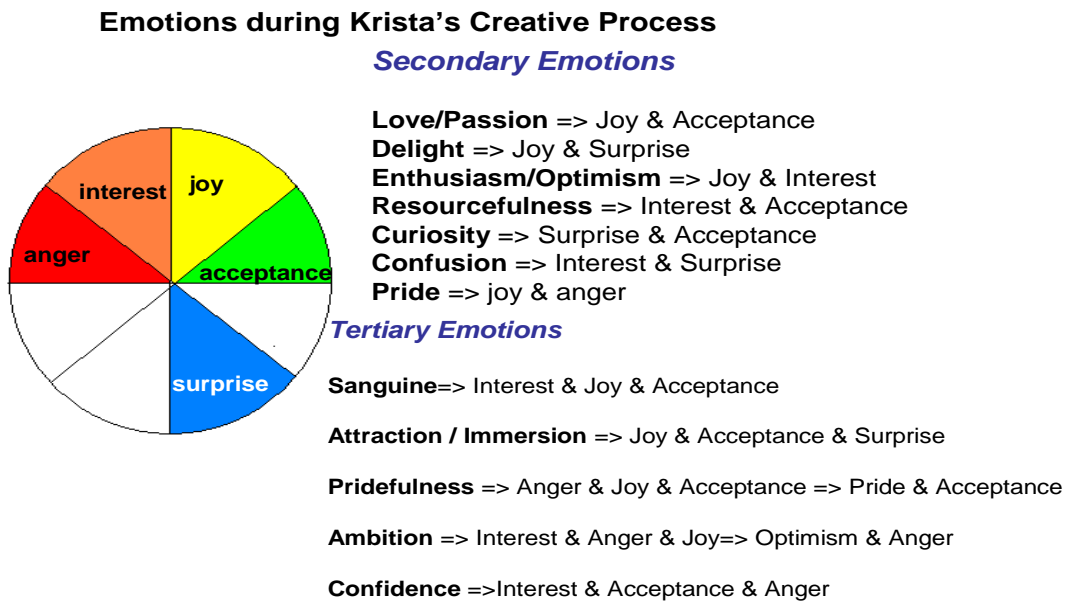


Figure 46 Emotions during Krista’s creative process

Emotions as a flow of energy

Activated emotions act as a flow of energy that integrates Krista’s brain with the rest of her body and pushes her body to move in a way that is synchronized with her concepts (Siegel, 1999; Siegel & Hartzell, 2004). Similarly, Lewis (1995) proposes that the processing of significant information in the presence of emotion can be analogous to the flow of energy in a state of disequilibrium. Freeman (2000a, 2000b) proposes that emotions are essential to all intentional behaviors. They are identified with the intention to act in the near future. They are a “stretching forth” of intentionality. Emotions can also be measured by the magnitudes of the tendencies to

chaotic fluctuations in brain modules (Freeman, 2000a, 2000b). Freeman goes even further by saying that

emotionality is not weakness but a sign of strength, because of its depth, range, and complexity beyond the instinctual attitudes of other animals cannot develop without structuring by reason and language. The highest and most complex levels of emotion are seen in poets and other natural leaders who have the greatest range of personal insight, cultural vision, and predictive power. (Freeman, 2000b, p.233).

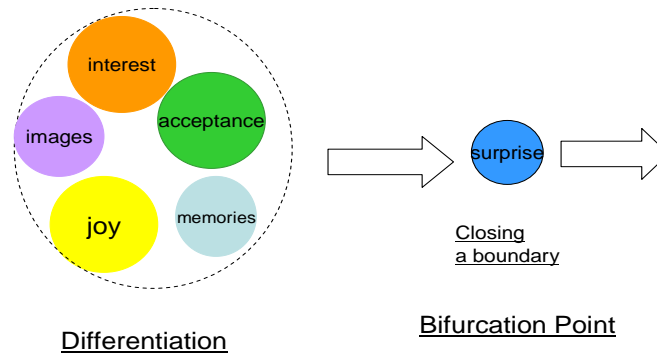
Krista would not be able to evoke emotions like passion, curiosity, enthusiasm or delight if she were not deeply interested in and captured by her subject, researching it thoroughly and sincerely.

Krista's Creativity as Dissipative Structures

Krista's emotions create the necessary condition for a far-from-equilibrium state and its critical fluctuations. These fluctuations continuously probe her mental structure and provide an opportunity to discover new patterns of behavior (Kelso, 1995). The new patterns emerging spontaneously as a function of the inner dynamics of nonlinear interactions between Krista's emotions, thoughts, images, and memories are called dissipative structures (Prigogine, 1980, 1997; Prigogine & Stengers, 1984).

For Krista, this is the most challenging phase in her process of creativity. The final movements in her act are dissipative structures that are sustained by the persistent dissipation of her energy. The flux of energy (emotions) through her body is the driving force generating order and complexity in her act. Following Prigogine's statement "order out of chaos", we can say "order out of emotions" (Figure 47).

Pattern Model of Krista's Creativity



Pattern Model of Krista's Creativity

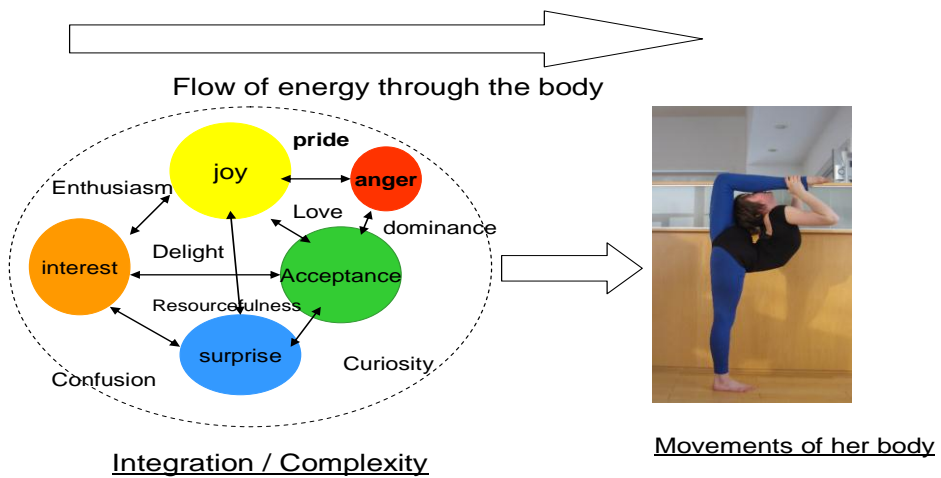


Figure 47 Pattern model of Krista's creativity

Finally, after a long process of working on the piece, Krista is ready to perform. *“When I perform, it is really me, and it takes what I train very hard to do and brings so much creativity*

into it,” Krista shares with me. *“I really connect with the audience and express myself doing something that I love doing.”*

After her audition she felt a great relief, but she also felt excited and nervous. Krista comments, *“Of course it was again an excitement to show what I was working on and what I am passionate about, but also very stressful. And I had it in my mind that it couldn’t go any other way. It had to be perfect. It is such a rigorous school that any little mistake can be noticed. So I did actually...It went very, very well.”*

Traits of Personality

The primary emotions during her work on the pieces, including creating and performing them, are *interest/anticipation, joy, acceptance, surprise*, and, to some degree, also anger. In Krista’s situation, anger can be considered a positive emotion that mobilizes her energy in her performance. By combining with each other, these emotions create secondary emotions like *passion, delight, enthusiasm, resourcefulness, curiosity, confusion*, and *pride*.

Numerous and recurrent occurrences of these complex emotions or dynamisms may lead to the stabilization of even more complex mental (affective – cognitive) structures that can be expressed by the traits of personality.

In Krista’s case, we can observe four (actual and future) traits of her young personality. She shows traits of *ambition* in her strong drive to accomplish her goals, *sanguine* features in her creativity, *confidence* as a result of her circus performances and public speaking, and finally *pridefulness* (in her future) as a result of her successful actual and future outcomes.

Ambitious => anger & interest & joy Sanguine => interest & joy & acceptance

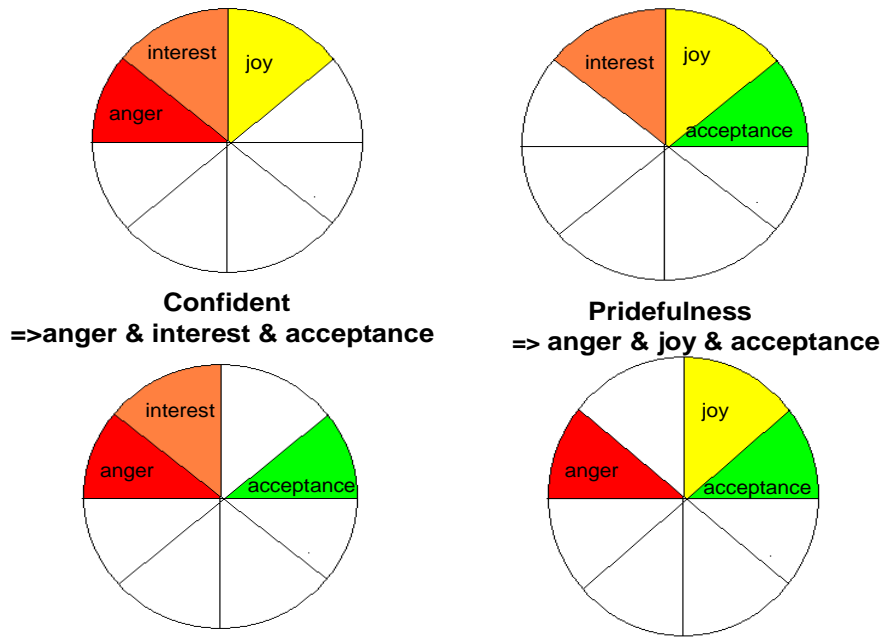
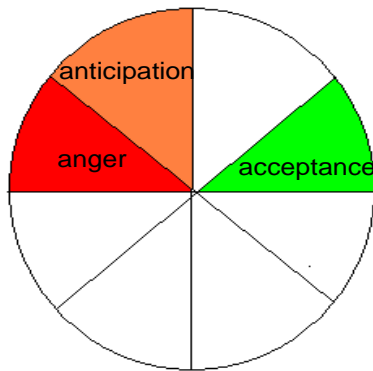


Figure 48 Four traits of Krista's personality

Krista's *ambition* can be characterized by her high expectations and her strong drive for the realization of her goals. In this case, ambition is understood as a combination of pride (an angry joy) and her anticipation of the outcome.

Krista's resourcefulness joining with joy creates a *sanguine* trait of personality characterized by vitality, energy, and an abundance of ideas (Figure 48).

Confidence => anger & anticipation & acceptance
=> anticipation & dominance
=> anger & resourcefulness
=> acceptance & aggressiveness



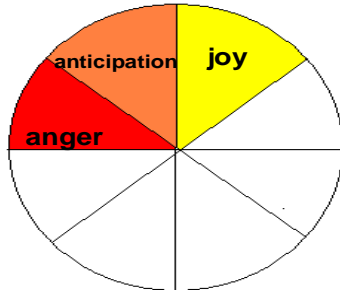
*You asked me if I was a shy child, but I don't think particularly but I do know that the circus has really developed a lot of **confidence** through that. I have done some a public speaking in the last year. I have to honestly let say six years to go I did not have so **confidence** and wanted to be up on the stage performing and public speaking.*

*Of course it was again an excitement to show What I was working on and what I am very **passionate** on it but also **very stressful** and I had it almost in my mind that it can't go any other way it has to be **perfect**.*

Figure 49 Complex emotion of confidence

Krista's love for circus performance and her enjoyment of public speaking gave her enormous *confidence*. Confidence is the emotion of assured expectancy. During her audition, Krista deeply felt that her performance had to be perfect. She was able to obtain her goal, and she was accepted to the National Circus School. In other words, Krista anticipated a desired future state. That means that her confidence is a combination of anticipation and dominance (anger and acceptance). Or we can look at Krista's confidence as a combination of her internal resources and her strong ability to utilize these resources (TenHouten, 2009) (Figure 49).

Ambitious => anger & anticipation & joy
 => anger & optimism
 => pride & anticipation
 => joy & aggressiveness

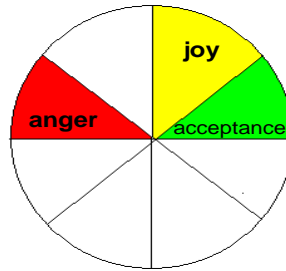


*I always **wanted to put my best** into everything.
 So I have always **the high expectations**.*

*This same with my training when I am going
 to something I want to do in **the best of my ability**.*

*I have this **strong drive** and I try to **learn how to cope**
 with it and deal with the more positive.*

Pridefulness => anger & joy & acceptance
 => pride & acceptance
 => dominance & joy
 => love & anger



*I was accepted...
 am **proud** and also I want to be ready. I
 am working really hard to be ready.*

Figure 50 Complex emotions of ambition and pride

Finally, *pridefulness* can be developed by the systematic experience of feelings of pride, which will allow Krista to reach a positive self-concept. In this way a state of pridefulness is a combination of pride & self-acceptance (TenHouten, 2009) (Figure 50).

Creativity for Me

I feel that it is something that I love doing

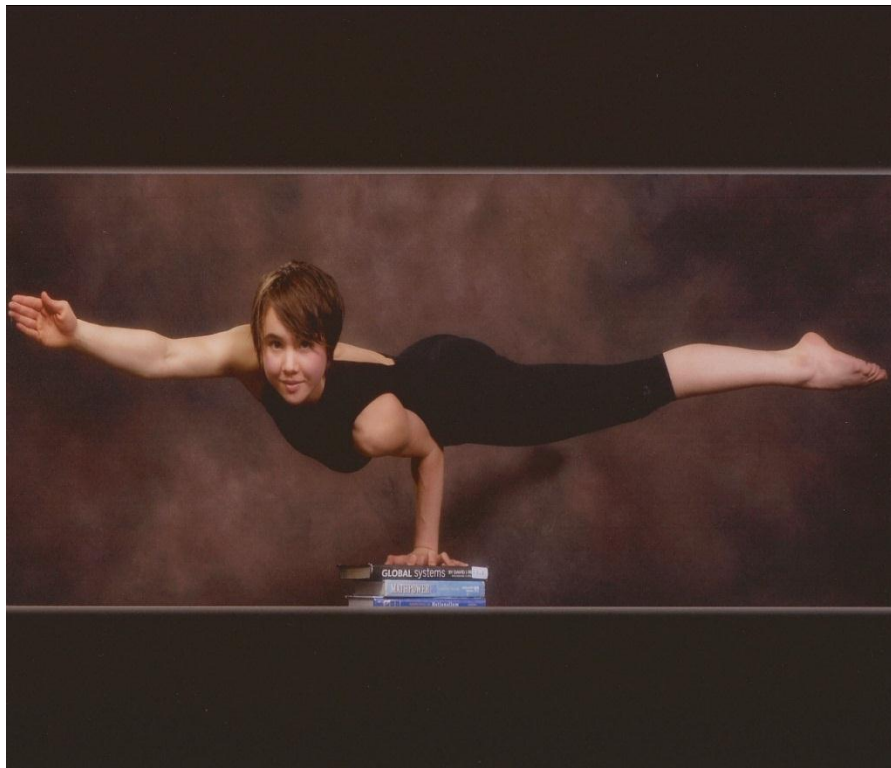
That I am passionate about

And I am able to share that with others

*In my performance, there is no speaking,
There is no text, and so I create the dialogue with eyes,
With eye contact*

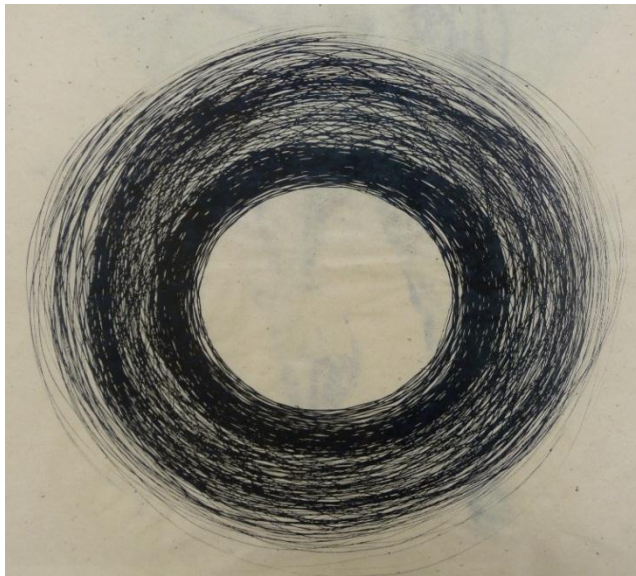
*I don't hope that the audience understands that certain meaning
That means for me.
I do hope that one person – one is enough – is inspired in some way*

*To be inspired in some way, in one's own life
That it triggers some reflection, some thoughts
Even if it is one person, I will be pleased.*



Eton – the Spiritual Artist

Next, I would like to introduce Eton, who is a fourth year student of visual arts at the University of Calgary. After reading the invitation poster for my project, he emailed me expressing his willingness to participate. A few days later, we met in the Art department of the university, in front of the Little Gallery, and really enjoyed talking to each other. At the end of the interview, Eton told me that he understands his art practice much better just by talking about it.



It is something bigger than me.

It is coming from me and through my hands.

It is like emotion but not like anger.

It is something much more complex.

A Spiritual Path

Childhood

Eton has a twin brother, five minutes older than him.

“We were kind of unexpected for my parents,” he says. “Both were unemployed at the time...This was really tough for them. I remember a lot of fighting in my childhood.”

When the twins reached the age of kindergarten, their parents had to decide whether to separate the twins and put them in different classes, or to keep them together. The school officials opined that they should be put into separate classes. *“It was really tough to break natural bond between us,”* Eton shares.

Eton’s interest in art started very early:

I remember we had to do Christmas mats. I had the proportions kind of right and had a little bit of perspective and the size was right. I remember that my brother had just little scribbles. I know, and my parents also realized, that I had a little bit of a gift for drawing. So my parents were supportive from an early age. And I even took drawing classes in grade three.

Eton’s father was a competitor, and organized sports activities for Eton and his brother. They were playing soccer in the summer and hockey in the winter. But, he says, *“I never had that competitive drive. I didn’t see it as a game, and I did not care if I lost. It was just for fun.”*

In grade three, Eton broke a leg and was in a cast for two months. He was getting drawing books from family members:

“I was there with this broken leg,” Eton remembers. *“I was sitting and drawing. I fell in love with copying. I would find in these books how to draw faces or horses. I was so good at copying that people said: oh...it’s so good, it looks like the original.”*

When I asked him what kind of child he was, Eton answered quickly:

I was very shy. I was a very shy kid. I don't remember really having many friends. I used to be a kind of imitator—going back to copying. I hung out with a friend who had a lisp and at home my mom asked me why I had a lisp. I was imitating my friends. I still do it to these days. I spend a day with my friends and I start talking like them, acting like them, swearing like them. You can say that I became a kind of imitator to fit in.

From an early age, he wanted to fit in.

His family moved a lot. When he was in a kindergarten and grade one, they moved from Calgary to Okotoks. Then, escaping from their suffocating grandparents, the whole family moved to Whitehorse, where they lived for one year. Eton says,

My parents felt very bad for us. They felt that they were selfish for tearing us away from our friends. I really felt like an outcast because I was a minority in Whitehorse. There were only a few white kids in a class. Teachers really sided with the native kids and their families...I was almost like a rebel and outsider, but I felt like a victim of these unfair teachers.

Then Eton's family moved to Regina for two years and finally to Sylvan Lake close to Red Deer. Trying to make friends, Eton ended up becoming friends with people who had no friends: "I became friend with outcasts," he says. Later through playing hockey, he met other people who became his friends from grade six through eight.

Emotions during Eton's childhood

Eton describes himself as a "very shy kid" who doesn't have many friends. His shyness can be a result of his *emotional overexcitability*. He is very *interested* in art, especially drawing, and *loves* doing it. Fortunately, his parents *recognize* and *accept* his special gift for drawing; they have

shown their support by enrolling him in drawing classes. During his time in Whitehorse, Eton felt very *unhappy* and *rejected* by his teachers. He felt like an outcast, an outsider, and a victim. The emotion of *sadness* joined with *rejection* creates the negative feeling of *misery* and *loneliness*.

Luckily, Eton's negative emotions of rejection and sadness (maybe also fear) are balanced by the positive emotions of his parents' acceptance, and his interest and love for artistic activities (Figure 51).

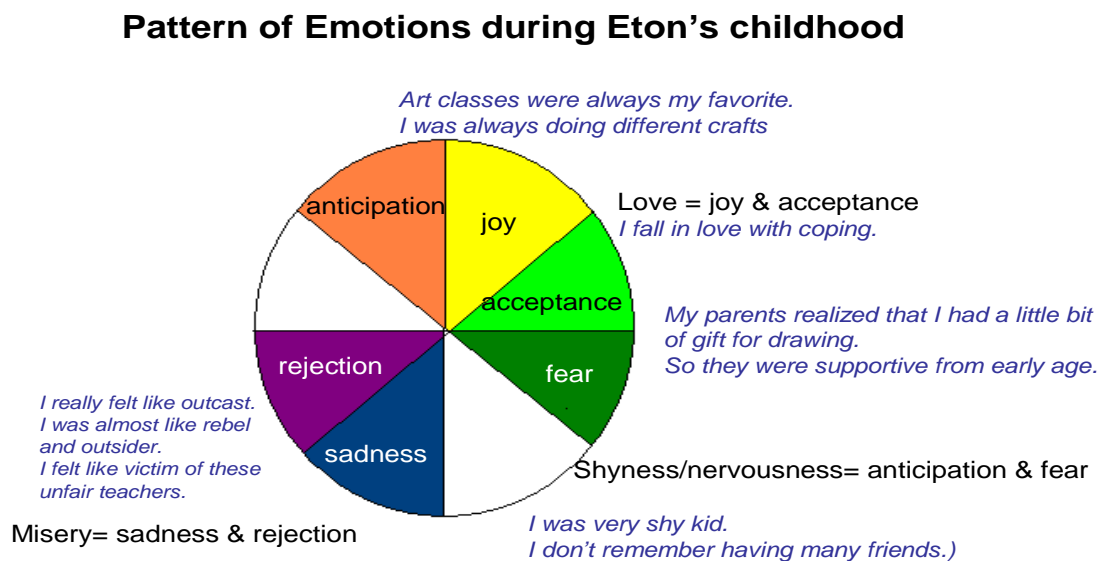


Figure 51 Pattern of emotions during Eton's childhood

Adolescence - The Spontaneous Multilevel Disintegration

At the end of grade nine, Eton lost most of his close friends over religion. Most of them were Catholics and they went to a new Catholic high school that was built in Sylvan Lake. He became almost an atheist, and wondered, "*What do these Christians, these Catholics, know about*

judging who is good and who is bad?" He now had no friends, and it took him almost an entire year to sort things out.

Fortunately, Eton continued to pursue his artistic activities.

I always loved art classes. I always liked my art teachers. We had special connections. They gave me a lot of encouragement because I put in effort. I was in their classes not because they were easy, but because I loved art. And they appreciated it.

Eton's parents really stressed the importance of education.

They always wanted us—me, my brother and my younger sister—to have better lives than they did, to be better prepared than they were. We always had to have above eighty in school. We had to read a half hour every night from an early age. They really stressed academics so that we could go to postsecondary.

Going to high school, Eton felt a little bit of disillusion. *"What is the point of all of this?"* Eton asked himself. *"Is this all of my life—writing essays, doing math problems? Everything seemed too specialized for me. Why do I have to know all of this?"*

He was very resistant throughout all of his academic courses. Yet somehow he managed to get eighty percent on his tests and exams.

"I was never embarrassed of my parents," Eton states. *"I never went through the adolescence phase of rebelliousness against parents. My brother did actually. I went exactly the opposite way...I was reducing my wants and desires and respecting what my parents did for me and their sacrifices."*

Then I asked him how he felt about himself during this period of his life and Eton answered, *"I did not have a lot of confidence in myself. I was still very shy."*

What about guilt or shame, did you experience these emotions? I asked.

I did. I felt very guilty about how I sometimes picked on my friend—on two actually. A lot of shame and a kind of guilt about that, looking back on it. I remember sincerely apologizing to one of my friend in grade twelve... I didn't realize how depressed my friend was.

Being an artist seemed out of the question but Eton knew that drawing was his passion. He felt very confused.

I felt so disillusioned. Always stuffing your brain with all this knowledge...I bombed on my diploma exams. I felt terrible. I resisted so much. I couldn't think that I was smart, book smart. And grade eleven went on and grade twelve went on, and my grades started slipping...I felt like I let myself down, let down my parents. I felt guilty about that. I doubted who I thought I was. I started really questioning myself: I am not this kind of the person who is studying all the time like my sister, even like my brother.

Then after grade twelve Eton and his brother decided to take a year off. His father supported their decision especially since he had traveled extensively when he was their age. But he gave them a great piece of advice: instead of being a tourist for a couple weeks, he suggested being a traveler and going for two months on the same amount of money. The boys had to earn money for their trip. “*My dad always taught us how to manage money. We worked, worked, and worked. We had a very strong ethic for work,*” Eton says.

Eton's adolescence can be described by the spontaneous multilevel disintegration. Because of his enhanced emotional overexcitability, he experiences intensive internal conflicts, doubt and resistance. He feels *disillusioned* and is *disappointed* with himself. Eton is confused about who he really is. He experiences emotions of *shame* and *guilt*. His psyche is in a chaotic state. He knows that he can't continue his schooling and needs time to find a solution for his life. These

internal conflicts, self-observation, confusion, and existential anxiety, are essential for making decisions regarding one's future (Figure 52).

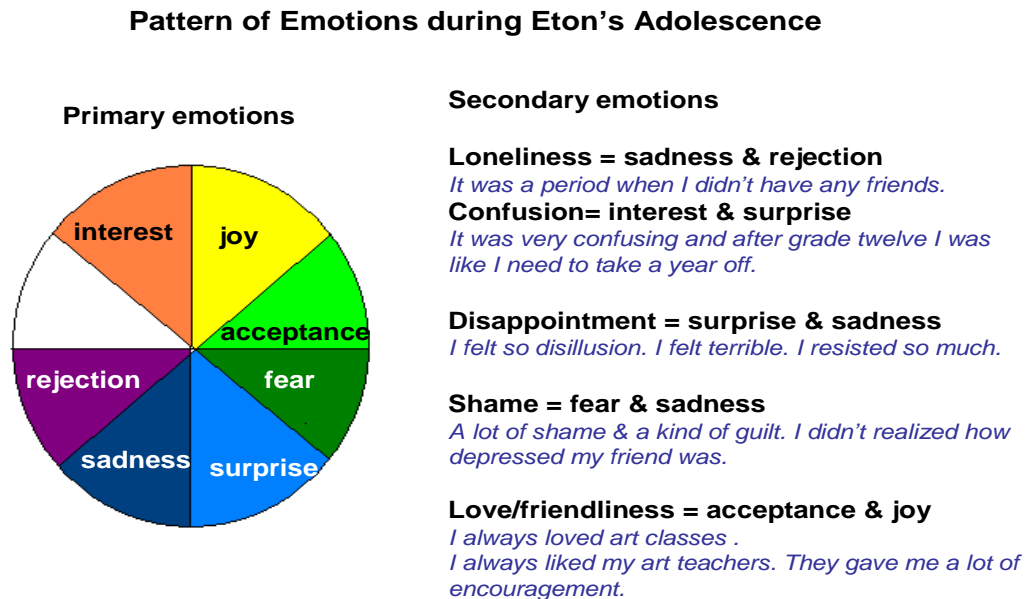


Figure 52 Pattern of emotions during Eton's adolescence

Young Adulthood – The Organized Multilevel Disintegration

Trip to Europe

Eton and his brother went to Western Europe for two months. “We felt so young and naïve,” Eton shares. They landed in Paris, then went to Barcelona, Granada, Malaga, Portugal, and Normandy.

I went to the Louvre. It sounds so cheesy now. It was not just the Louvre that got me really interested in art. I think that it was a wider vision of human condition. Looking at people in Paris—specifically, how people live their lives. They live closer to the edge, it seems. You see poverty, you see people living on the street, and you see people talking to

themselves...I felt more alive after that trip, more human. I could feel things deeper. I felt on a deeper level, not on the superficial level of a movie.

After his trip, Eton made a decision: *“I don’t care if I make a lot of money. I don’t care if I have a secure job. I am going to art school. I am going to art school!”*

His parents agreed with his decision, but under one condition: he has to go all the way—he has to get a PhD. *“I liked this idea, being a professor and teaching people.”* He even got a bracelet with six straps on it representing six years of commitment to his studies.

I poured my heart and soul into it. I was there nine in the morning to nine at night...I was determined to be the best artist. I was competitive because I loved it. I took it very seriously. I really wanted to impress my professors.

Eton’s decision as a Bifurcation Point

Before his trip to Europe, Eton was in a state of turmoil, experiencing a variety of confusing emotions. His mental state was far-from-equilibrium. This state is extremely sensitive to perturbation: even the smallest one could turn crucial. Eton’s enhanced overexcitability and his sensitivity to the human conditions he saw during his trip, especially in Paris, were crucial factors toward making his important decision. He decided to follow his passion of being an artist. His decision became the bifurcation point in his life, and his mental structure self-organized into a new higher level of order and organization. Eton felt more alive, more human. He felt things on a deeper level and was completely committed to his artistic study.

Through his decision, Eton started transforming himself to the organized multilevel disintegration. He experienced much less tension and was enormously focused on his future goals.

Meeting a Spiritual Woman in Art School

During his first years of art school, Eton met woman, who modeled for his drawing class.

As Eton recounts, opening up genuinely,

She was an older lady. She was the most spiritual woman that I ever met. She opened my mind again. My trip to Europe was the first to open my mind, she opened it again. She was working from something deeper, something from her being, her soul. She was just a beautiful person. Not like a model from a magazine, but a glowing person. We had an amazing connection. She was ten years older. It was not a sexual connection. It was a spiritual connection.

The woman reached to him with spiritual books on Buddhism and Zen and special music.

Then I became really, deeply interested in spiritual things...I read a lot of self-help books. I did not know if I was depressed but I needed these kinds of books to get out of being in a funk or depression. By reading I was entertaining myself. I had books on Zen, on Buddhism. I kind of created my own religion, a personal religion based on what I thought was good, what I thought was virtuous.

Eton started to regret his experience at Red Deer College, where he treated everyone as an enemy and as the competition. He regretted his selfish attitude that convinced him he didn't need to have friends. "Reading these books, it gave me a new perspective on life, not just using everyone as a ladder step," he says. And Eton asked himself why he was pushing these people away:

Even in my third year here, I never really got that close to anyone...Even being an artist I still feel like I want to separate myself. I want to get closer to professors than to my peers.

Dynamisms of the Organized Multilevel Disintegration

“Subject-Object” in oneself

Eton continues his psychological development. Meeting the spiritual woman was the second bifurcation point in his life that pushed him to a higher level of growth.

Through the dynamism of *“Subject-Object” in oneself*, he is able to observe himself with criticism (*“It totally made me regret my experience at Red Deer College.”*). He becomes more friendly and sensitive to other people. He questions and regrets his selfishness (*“Why was I pushing these people away?”*).

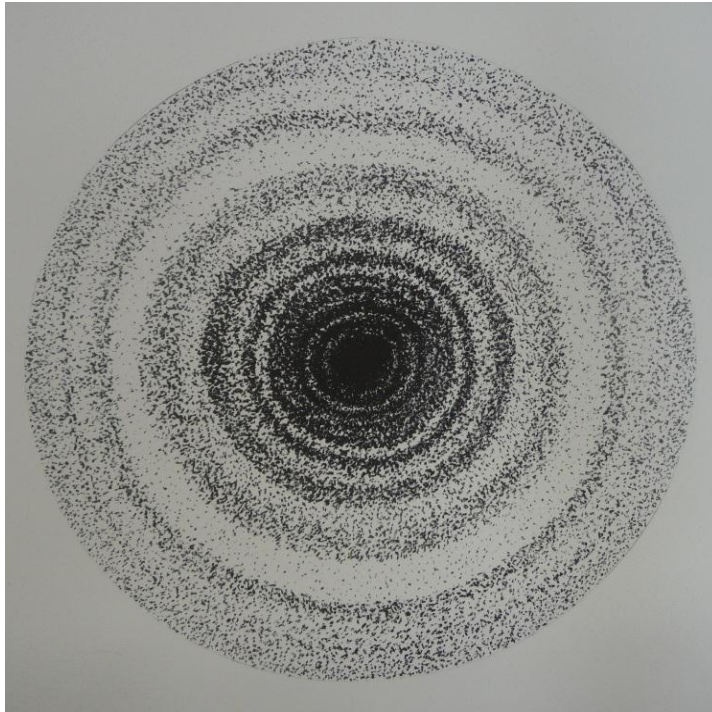
Eton is deeply interested in spirituality, reading books on Zen and Buddhism and getting a new perspective on his life (*“I kind of created my own religion, a personal religion based on what I thought was good, what I thought was virtuous.”*).

Creative Dynamisms

During this period, Eton is constantly developing as an artist, shifting from drawing to non-objective abstracts. He explains that,

In the first and second year, there is a lot of focus on technical drawing. I was really good at drawing models. That was my thing. That was what I loved to do. That was what I was best at. When I came here (The Art Department at the University of Calgary), I was like, I am going to throw all of that out the window. I am going into non-objective abstract. I am going to take lithography because I have never done it. I started getting interested in non-object art as a way of expressing something deeper, something spiritual, something mystical, something that is not in this world, transcendental philosophy...I become really process-oriented. I wanted to really focus on the process. It

was a sort of moving meditation, doing repetitive movements, trying to draw circles over and over again...



Eton is doing lithographic prints by grinding the stone for an hour to get an unexpected image. It is, for him, like the Zen practice of letting go and concentrating on the process of what it will be. Eton spends a lot of time doing these lithography prints. Some of his prints take him days to complete, whereas others are a quick expression that might take him two minutes to do:

“It is energy in that time, in that moment,” Eton describes. “This is like a Japanese Sumi-e brush painting. Everything is about this moment, recording this moment, recording this motion.”

Before starting this process, he has to quiet his mind with a breathing exercise. *“It kind of overcomes my mind, quiets my mind so that I can reach something deeper.”*

I ask him how he understands this “something deeper” and Eton answers:

I think that it is something bigger than me. It is coming from me and through my hands. It is very hard to express in words. It is like an emotion but not like anger. It is something much more complex. You lose track of time. It is like your ego disappears if you are doing it right. You are forgetting who you are, and what you having for lunch. It is like meditation making art. I am trying to make a huge connection between them.

In his third year, Eton did not want to paint realistically, only abstractly. But now, he says,

I have come to the realization that all art is the process—all kinds of art, whether it is realistic landscape or abstract...It is more in what state you are in when you are making it and if you are connected. If you are not connected, it does not matter what you are doing—it shows that you are not there.

During the third year of his study, one of Eton's professors commented that his abstractions are masks, that he is masking something:

I thought about it, really long and hard. I don't know what it means. I don't know if I should take that as an insult. Maybe I was not present in all of them, maybe there weren't emotions in all of them. That is what I am striving for, and maybe I was not challenging myself. I think he thought I was taking the easy road.



Now, in the fourth year of his study, Eton is planning to make a copy of Vermeer's paintings. He wants to challenge himself. Vermeer was a very mysterious painter. He did only thirty paintings in his whole life. And there is a controversy of whether he used a camera obscura to project images, which he would then just copy. For Eton, the project will be an enormous challenge because he will be making copies in a different way—by gridding the paintings and translating them from half size to double size. He is doing exactly the same size of Vermeer's paintings. Eton says,

It might be a practice of humility or it might end with the realization that I can't do it. I like to challenge myself. I challenge my colleagues and my professors too. 'You think that you know me?' I might surprise myself or I might not be able to do it.



At the same time Eton, as a result of working at Superstore, is interested in another process using fruits and vegetables, and looking at them in different ways. By coating them with a plastic-gel medium, he is using them as metaphors for the human body—a representation of our attempts to overcome nature, or to resist change or death. It will be interesting, for him, to see how it turns out.

“Now I am looking for similarities between painting Vermeer and experimenting with fruits and vegetables,” he explains. *“It is dealing with the unknown. If I knew how to paint Vermeer, I would not be doing it.”*

Pattern Model of Creativity

Eton is deeply *interested* in non-objective art as a way of expressing something deeper and something mystical. He is completely *immersed* in and *connected* to the process of creation. He experiences enormous *joy* during this process. Joy connected with *anticipation* creates a secondary emotion, *expectancy* or *enthusiasm*, that pushes him to further exploration. Anticipation, by joining to acceptance, creates *resourcefulness*, which has a cognitive element,

During the process of creativity, Eton experiences also a tertiary emotion such as *temptation* or *attraction*, which is a combination of the emotions of joy, surprise and acceptance. Attraction can also be expressed as a combination of the secondary emotion of delight (joy and surprise) with acceptance, or as a combination of love (joy and acceptance) with surprise, or finally as a combination of joy with curiosity (surprise with acceptance). The artistic practice is an enormously engaging and absorbing activity. Eton expresses this tertiary emotion in this way:

It is coming from me and through my hands...It is like an emotion but not like anger. It is something much more complex. You lose track of time. It is like ego disappears if you are doing right. You are forgetting who you are...It is like meditation making art.

This is similar to the concept of *flow*, introduced by Csikszentmihalyi (1990, 1996, 1997). The artistic process is also a very enjoyable and satisfying process of human activity.

Another tertiary emotion that Eton experiences during his artistic practice is a combination of *anticipation*, *surprise* and *joy*. Anticipation & surprise create *confusion* or *uncertainty*, and in combination with joy can create the experience of *enjoyment in the unexpected* or the *joy of uncertainty* (Figure 54).

Eton reveals:

It is also another impulse inside of me...Everyone dismissed me: 'This is an abstract guy who can't draw or paint realistically.' It is a bit of a surprise. 'This is Vermeer. Who painted Vermeer?' This is a part of that. I challenge myself...I might surprise myself or I might not be able to do it... It is an interesting process, dealing with the unknown.

Pattern of Emotions during Eton's Artistic Practice

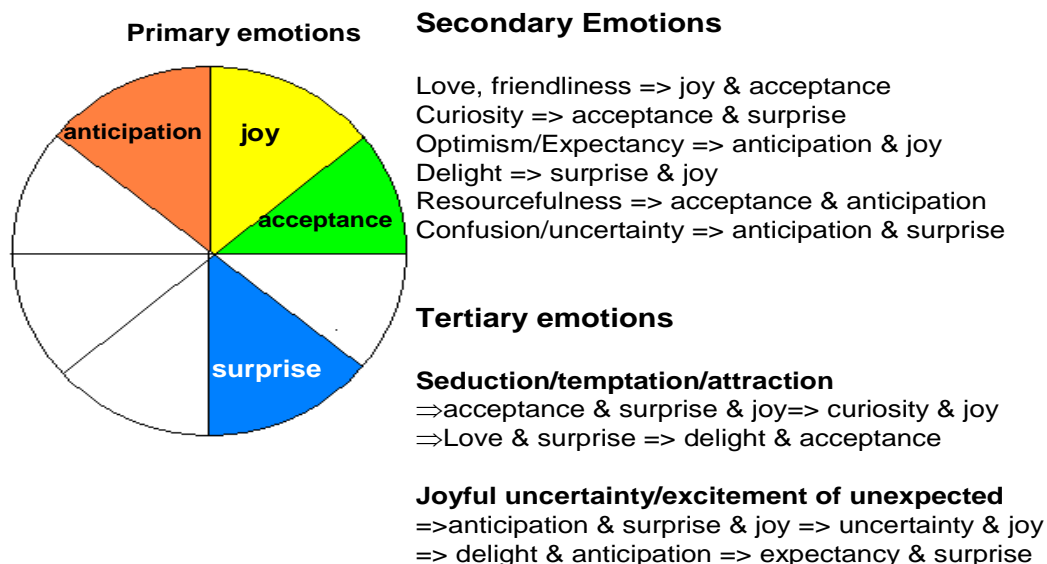


Figure 54 Pattern of emotions during Eton's artistic practice

Art as a Spiritual Practice

When I asked what it means for him to be an artist, Eton says that he has been thinking about this for a long time. He sees it as a spiritual practice. Eton states with passion in his voice,

If I don't enjoy the process and it is leading me into the ego direction, I don't want to do it. I only want to be closer to my being, to my soul. My girlfriend and I, we want to do only what we call good for goodness sake, what is right to do. Through my painting and her writing, we want to develop these virtues: patience and understanding, forbearance and being in the present moment and being the wind of change in this world. If a hundred people change, it is good. If ten change, it is good. If one person changes, it is just good.

Hearing Eton's statements, I tell him that he is lucky to discover this wisdom so young. With a big laugh, Eton replies that this is just what he and his girlfriend have been telling each other.

“Who gave us this big secret?” Eton wonders, wrapping up his interview. “Everything is so good at this point. Maybe I will die at an early age. I believe in Karma and reincarnation, and I know that the next life will be okay too.”

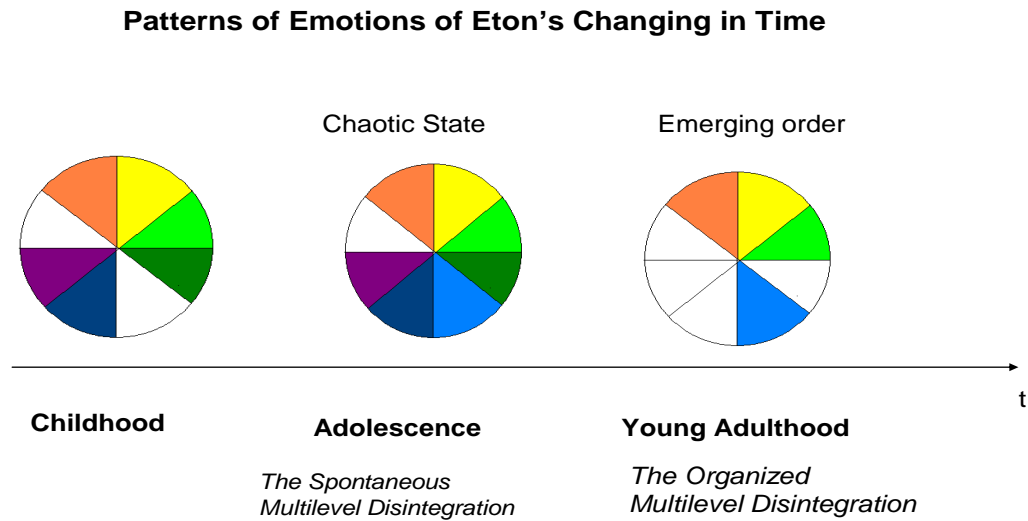


Figure 55 Patterns of emotions of Eton from childhood to young adulthood



Marsha Park – The Young Writer

It's like the true me illuminated.

The energy is flowing through me and there is no blockage.

My life is turning into a manifestation of love, of humanity, of Zen.

After my second meeting with Eton, he introduced me to his girlfriend, who was helping him prepare the installation, “How Nature Works.” She was willing as well to share with me her young but very creative life.

Marsha is a young writer/journalist who has just finished the two-year Journalism Art program at SAIT. During her studies she wrote a variety of articles for the Calgary Herald newspaper.

Life Story

Marsha describes herself as “*a child of a single mom who worked too much.*” Very often, Marsha had to stay at home by herself and find activities to occupy her time. Marsha loved reading, and when she was tired of books, she went on to coloring books. “*I love color,*” she says.

Marsha has fond memories of her experiences with ballet.

I was in ballet when I was little. I loved it. It was my first experience with something bigger. My teacher turned on music and told us to close our eyes and dance around the room. I remember it was amazing. As soon as you close your eyes, the music creates images in you. I did not have any idea what this music was about but I remember that I saw a swan in a beautiful park. So I became a swan.

When she was a young girl, Marsha and her mother went to church regularly, but they stopped when Marsha saw the Easter play and got terrified. Her mother was introverted, and she did not share herself with Marsha. Marsha reveals, “*So a lot of my life I have had to figure things out by myself.*”

During her early teens, she grew very fast and was always taller than other children. She was caught by the idea of perfection: “*I started wearing make up when I was twelve. Full make up. I started dyeing my hair. For the perfect image.*”

In middle school, Marsha was involved in sports activities like basketball, but she was not competitive or aggressive.

After a five-year break from ballet, Marsha started learning the dance styles of jazz and hip hop.

It was a lot of fun and I really loved it. I learnt that I am a kinesthetic learner. I really like to move my body and do things. A lot of my art work is very process-driven in the sense of starting something spontaneously out of motion. Even my writing seems to go that way too.

When I asked her when she started to write, Marsha answered:

It mostly started when I was younger. Like in grade five. I decided to go to the writing conference. I never really realized that it was a big thing. It was really fun. I wrote a lot of stories after that, just fan stories, and I drew pictures for them. And then I stopped writing and started questioning my writing—whether I am good at it—through junior high school. Writing was not cool. Being good in English and reading was not cool. I really wanted to go into music.

Marsha went through a period where she wrote only for English class, but during this time she realized what kinds of things she likes to read. She likes character driven stories. “*I don’t really like mysteries; I don’t really like S-F (science-fiction) unless the lead characters are very dynamic,*” she explains.

In high school, Marsha started a book club with three other girls.

We would each pick up a book and read it and then have a sort of party about it afterward. This club was named John. We needed a name. We had a notebook that we kept and passed to each other. Mostly we were writing about life. It was very interesting. You’d get it and keep it for two months under a bed without doing anything with it and suddenly you’d have a great idea.

During the end of junior high and the start of high school, Marsha's mother started to get very sick and was going for treatment. Marsha didn't share her mother's sickness with other people because she didn't want their pity.

"My mom and I went through a very turbulent time," Marsha says. "She was so absorbed by her disease that she didn't have the energy to be with me. I felt very alone during this time."

When she was sixteen, Marsha wrote about her loneliness in her diary:

I feel lonely. I fear I always have. A lonely child of a single parent who works too much. Everything I do is alone. Will I always be alone? I'm disconnected. I never feel like I can really share with people. It is fear. I've become so solitary that I've partially become hard and cold. I don't joke much or laugh much. I don't feel safe around people. I start to get nervous because I think they shut me down. How is it that I feel alone around my peers? Loneliness hurts. Loneliness is fear. Loneliness is a smoky fog that burns my eyes and coerces my lungs. Loneliness grasps my empty heart ever squeezing...Loneliness is punishment for being unworthy. Loneliness is chilling. Loneliness makes me cry, no one to wipe my tears. Loneliness is my only companion.



During her teen years, Marsha continued with the idea of perfection. She was getting good grades, was very active in school, and was involved in the school council and additional art activities. Marsha wanted to be the perfect daughter. *“My mom was sick for a long time. I didn’t want to show her how sad I was about things, how much fear I had,”* Marsha reveals.

Marsha also went through a period of being bullied by her colleagues. *“They would talk about me behind my back. They always tried to hurt me.”* Fortunately, being an active reader, Marsha found an inspirational statement from one of her young adult books: *“You are responsible for your happiness.”* She figured out that others could be hurtful, but only she herself had the decisive voice of what was happening in her life.

“Either I was letting them do it or encouraging them to do it,” she says. *“So I split with them at this time and I realized what I am looking in relationship.”*

Marsha did not go through the turbulent adolescence period. She says that, *“Instead of being really emotional, I had a lot of things happening in my life.”* She undertook a parental role during her mother’s illness.



When she was approaching her seventeenth birthday, Marsha was very excited. She would no longer be this “sweet” sixteen year old girl. She could drive and have more freedom. She made a promise to herself:

I want to excel at my art class! I’m going to make more and better friends. I will go to plays, movies, and galleries, play guitar...I am going to get a job in a café or flower shop or store. I will paint a mural. I will go to Canmore. I will visit my family. I will go to parks. I will go for a road-trip. I will love myself.

When she was eighteen years old, she met the man of her dreams and never felt happier. She recounts that,

Walking down the hills of the city, catching every green light and holding his hand breathed inspiration into me. Movement. Enthusiasm. Curiosity. We felt like we could take on the world! We discussed Art and current ideas. Talked about getting fit and which window of the high-rise we'd look at in the morning. Love.

Unfortunately, at the highest point of her happiness, Marsha received terrible news that her mother had cancer again. *"That one sentence shattered my feelings of hope and adventure. It is not fair..."* she cries in her diary. *"I feel like cancer is taking my mom away from me just when I need her most and will get to know her as an adult."*



Development through Positive Disintegration

The Developmental Potential

Five Forms of Overexcitability

After reading Marsha's diary and listening to her interview, I decided that Marsha is a young woman extremely rich in all five forms of overexcitability.

She is a very emotional and sensitive person. When she was sixteen, she wrote: *"Every month I get overcome by my emotions...I think it's when my body is fed up with all my suppressed emotions and it decides for itself to EXPLODE."*

Later, when she was nineteen, she wrote about her emotional needs:

I need respect, acknowledgment, a feeling of belonging, security, trust, appreciation. I feel a real need to have friends right now. Female friends, who I can look up to, to be honest with, talk without filters, and whom I can have compassion for. I want friends with whom I can talk about life and spirituality.

She is also a very sensual person. During her early adolescence, she was caught by the idea of perfection. *"I started wearing make up when I was twelve. Full make up. I started dyeing my hair. For the perfect image."* Later, during the middle of her adolescence, she continued with the idea of perfection, but in a completely different way. She wanted to be the perfect daughter. *"I didn't get bad grades. I was in school council. I was in art. I had these expectations."*

Marsha has always loved reading. In high school she realized what kind of things she liked to read. She writes (in her diary), *"Reading clears my head while filling it with entirely new things."*

During her early experiences with ballet, and later with jazz and hip-hop dance, and her artistic practice, Marsha demonstrates psychomotor and imaginal overexcitability. She says,

It was a lot of fun and I really loved it. I learnt that I am a kinesthetic learner. I really like to move my body and a lot of my art work is a very process driven...Even my writing seems to go that way too. I don't use outlines I just kind of go.

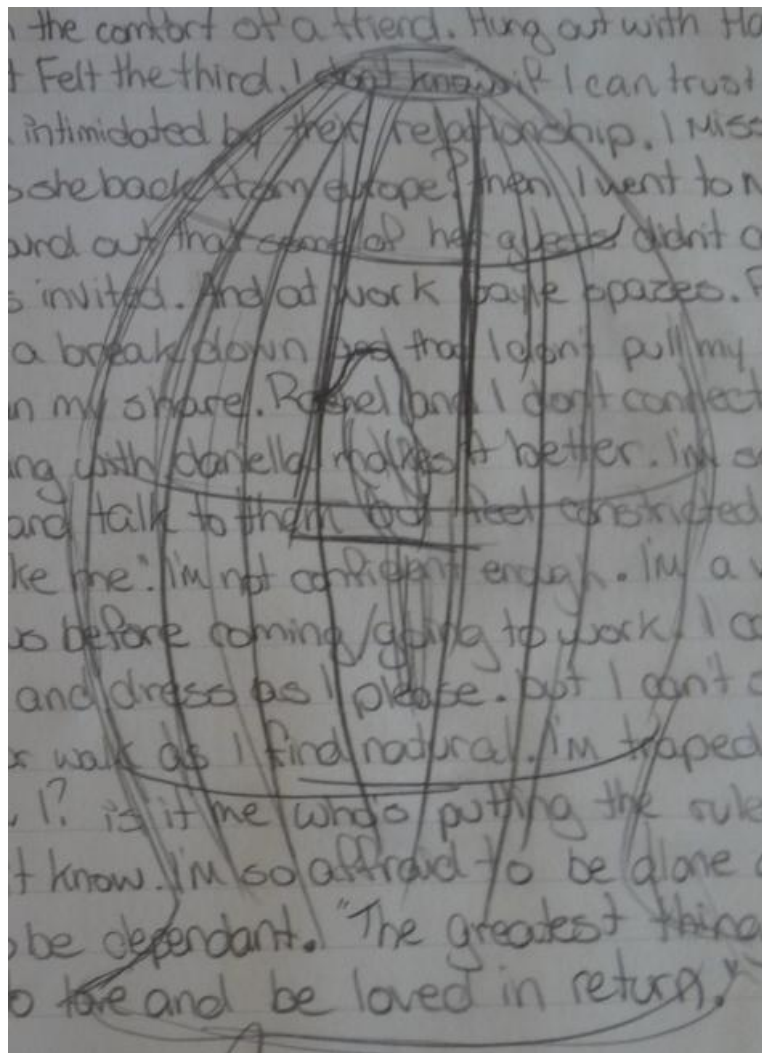
The Spontaneous Multilevel Development

Here I analyze Marsha's emotional growth during her middle and late adolescence by applying the theory of positive disintegration.

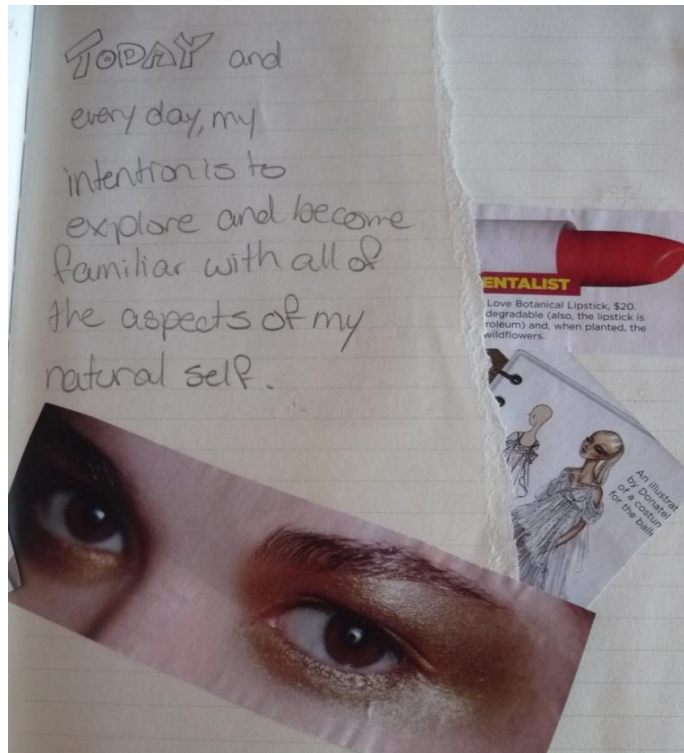
During the period of middle adolescence (14-17 years old), Marsha feels very lonely, disconnected, unworthy, and very fearful of her future growth. She expresses her emotional state in this beautiful statement:

I am afraid, but not because I don't understand. I'm scared of what will come day after day to follow the dark behind my eye lids... Loneliness is my disease. Alone in my thoughts and in my movement. I am the exile. The one whom society has forced solitude upon. The one who wishes to bloom and grow but has only a dark gloomy corner where only half of her branches reach full potential. Only one side blossoms.

Marsha is looking for something different in her life, but still she feels limited and enclosed. She writes in her diary, *"I feel like I'm constricted. Like there are lines drawn as boundaries to tie me in, hold me up. ...I know I am looking for something a little different, yes, but is it THAT different?"*



She also experiences intensive inner conflict. She would like to open herself to her friends but she feels rejection. She hates to be alone but is terrified of being dependent on others. Marsha also dreams to find love and to be loved in return.



During this period, Marsha experiences a strong anxiety in the contact with other people, especially with boys. In her diary, she writes:

Anxiety sucks. Anxiety doesn't help. I know it could just be being nervous about talking to London, but to the point that it turns my stomach is a little excessive. But I am not nervous to talk to him when I do it. I am nervous to be too open. Ha. Nervous to overexpose myself since he seems to be shy.

All her experiences of intensive inner conflicts, self-observation, self-evaluation and existential anxiety are the result of the internal differentiation of her mental structure. In the theory of positive disintegration, the level of spontaneous multilevel disintegration is characterized by the intrapsychic processes of differentiation. The process of differentiation of the mental structure leads to the chaotic behavior that is a result of nonlinear and recursive interactions between different emotions/dynamisms. Developmental dynamisms are products of

the five forms of overexcitability, and can be viewed as channels through which information flows in the form of sensations, feelings, experiences, images, ideas, hopes, and desires (Piechowski, 1999). In Marsha's case, these channels are open wide, and the abundance and diversity of feelings, thoughts, images, and sensations will inevitably lead to dissonance, conflict, and tension (Piechowski, 1999). These inner tensions and conflicts create a far-from-equilibrium state, and the rapid flow of energy links the components of mental structure into coherent, higher-order forms. These higher-order arrangements are developmental dynamisms, or secondary and tertiary emotions, that act as loops of positive feedback. In Marsha's case, these dynamisms shatter the pre-existing lower-level organization of mental structure that she wants to escape from (Figure 56).

Emotions & Dynamisms during Marsha's Middle Adolescence

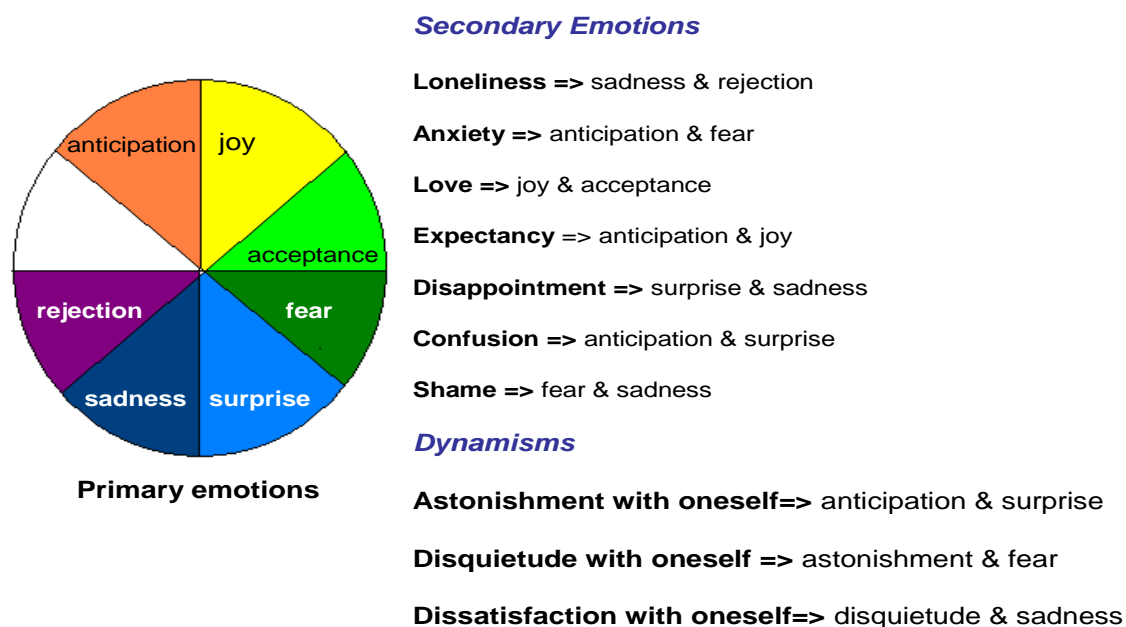


Figure 56 Emotions and dynamisms during Marsha's middle adolescence

During the period of middle adolescence, Marsha is deeply interested in art and loves making it:

The best part is when everything goes quiet and I draw or paint. My mind checks out and I can see things as they are... I think that I spend a lot of time mentally preparing myself to be an artist. In all truth I think it's romantic, and one of the only things that I can put my (picture of heart) into. Maybe I'll just do it as a hobby tho?

And later she writes:

Drawing is still the best relief. Art and good music! I wish I could rinse my doubts in my mind! I've started to doubt everything I am. It must be the instability of my life recently and the pressure to make decisions about my future. BAH!

Marsha's creative dynamisms (1) arise from her enhanced sensitivity to her internal and external world, and become an outlet for the increased tension of her inner conflicts. They are associated with her doubts and her nervousness but they also give her enormous joy, satisfaction and pride.

The Organized Multilevel Disintegration

When Marsha approaches the late adolescence period (17-20 years old), she is more conscious of her psychological growth, but she still has a lot doubts and worries that she will be constantly on the move, constantly oscillating. She needs more stability and order in her life now.

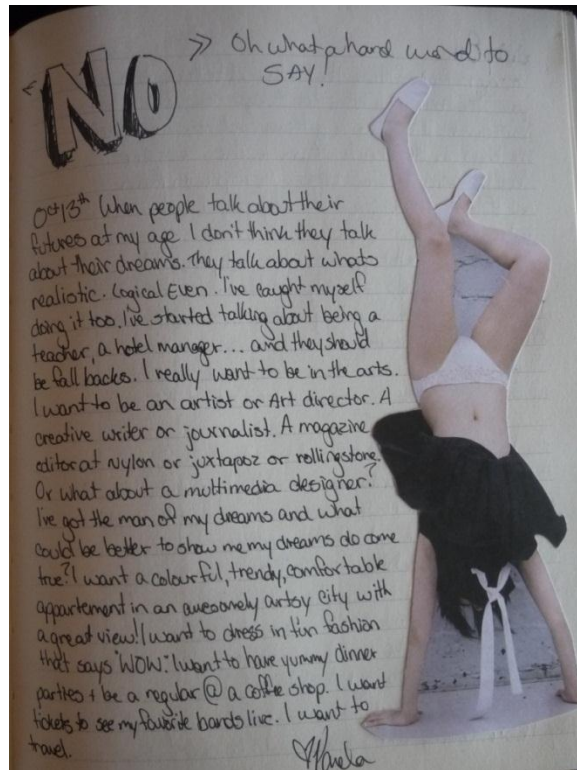
She writes:

I'm at the part in my life where I'm supposed to grow and prepare for my future. So I need to get inspired to do better in school....I know that I'm going to move around a lot to find where I fit and where there is good energy. But I'm scared that I won't settle and

will always be on the move to something or from it. I'm scared I won't grow to my potential. And that no one will love me. I keep thinking that somewhere I will fit with someone, but what if I don't? I don't like this between stages that I'm in. I'm not sure of anything. It was easier when I just had to be a pretty, well behaved girl.

Marsha's main concern is the decision regarding her future profession. She criticizes herself for neglecting to think about her future realistically. She starts talking about being a teacher, or a hotel manager. But what she really wants to do is be involved in the arts: *"I want to be an artist or Art director. A creative writer or journalist. A magazine editor at nylon or juxtapoz or rollingstone. Or what about a multimedia designer?"*

Marsha's psychological development at this point comes closer to the level of the organized multilevel disintegration—a further expansion of the spontaneous multilevel disintegration. The characteristic feature of this level is the conscious transformation of oneself and the synthesis that leads to the increasing stabilization of the hierarchy of values. Here, there are still existential and philosophical conflicts but they are characterized by lesser tension. Behavior changes towards self-perfection and emotional relationships become deeper and more enduring. Individuals on this level focus on their own futures and their personal goals.



Dynamisms of the Organized Multilevel Disintegration

The dynamisms of the organized multilevel disintegration act much closer with each other than in previous levels, and help to organize and stabilize the mental structure. The main dynamism is the “Subject-Object” in oneself dynamism, which involves self-observation, self-evaluation, and a conscious need for development. Very often this dynamism appears suddenly in the form of an insight into the significance of one’s own behavior. This is what Marsha experiences:

Epiphany...last few days I have been feeling like what my cell phone experiences when the cord connects to the outlet. Accumulating energy. Inspiration ...I’ve been waiting at my desires to create. Write, dance, photograph, draw, paint, even to make music. It has been a constant vibration, anxiety, and anticipation. My pen, my brush, my hand has grasped it. Still not entirely clear but close. Live in the now.

In Marsha’s case the “Subject-Object” in oneself dynamism works very closely with the creative dynamism (2) that helps in the organization of a new and more complex mental

structure. In art, she is really interested in doing paper cutouts. She usually takes a piece of paper and starts with one cut and then that cut influences next one. *"It usually comes as a spiral or other shape."* This method of creation reminds me of the self-organizing process that we observe in nature. Her artistic process is very intuitive. She really believes in intuition, not only in artistic practice but also in her life. *"I was making a lot of decisions in my life based on intuition,"* she says.

Marsha compares intuition to the signs that help her and protect her.

Marsha is able to gradually increase and deepen her knowledge of herself and to authentically choose her aims and ideas. She expresses it in this way:

It's like the true me illuminated....The energy is flowing through me and there is no blockage. My life is turning into a manifestation of love, of humanity, of Zen. The view from my window is so beautiful because everyone co-exists, the trees grow and I am at peace. Tranquility. Oneness.

The other important dynamism at this level is *the third factor*, which represents the autonomous forces of self-directed and conscious choices and decisions in one's development.

What would I like to see happen in my job or life that would nourish me fully?

I would like to find a balance between school, the weal (the student newspaper), and my life. There is too much overlap and I never fully committed to one or the other. Making time to meditate or to do yoga every week would give me some internal silence to better listen, to be the will of God. From there I will be more able to be conscious and present in the moment. I will be living the now, with love and intention.

Marsha is also going through the process of figuring out what she wants to write. She is contemplating writing short stories or conducting a series of interviews with emerging artists.

After finishing the Journalism Art program, Marsha again has to decide the next thing she will do with her life. She writes:

I've decided to finish my degree in Communications this fall. I'm not excited to head out into the world of corporate communications, newspapers and PR. Rather I'm looking to do special features for magazines and publish a book. So why am I even finishing BaComm? So I can take classes @ U of C that I am interested in. Creative writing, anthropologies, West African dance? I've started to see these next two years as the first two of my education degree. Thinking about being a teacher makes me so happy. I feel like I'll actually be in control of my life and enjoy the outcome. I'm only 20, so it isn't as though I'm losing time while I work on my B.Ed. Teaching is about contributing, challenging and inspiring children. Who wouldn't want to spend all day with children? I want to create some art work for my classroom with them, help pick books to read, and live with a curiosity and fire in my life.

As a result of the third factor dynamism Marsha begins to realize what is essential and lasting in her development. This dynamism contains the tertiary emotion of *hope*, which is oriented toward the future with a feeling of uncertainty of whether the future will bring happiness or sadness (Figure 57).

Emotions & Dynamisms during Marsha's Late Adolescence

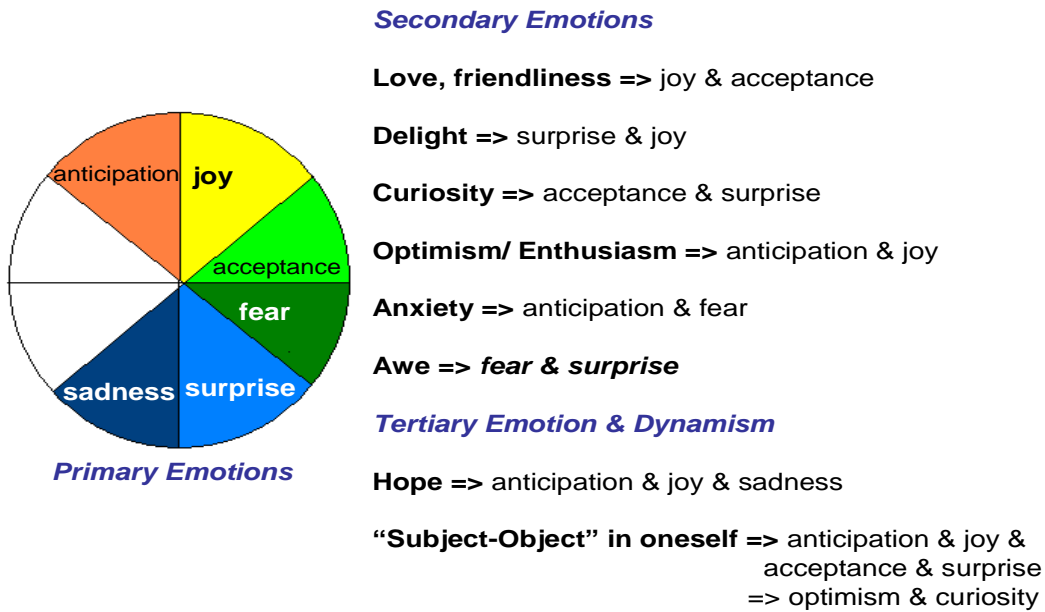


Figure 57 Emotions and dynamisms during Marsha's late adolescence

During this period, Marsha opens herself to others and is able to find deep love.

There is no one else that I could possibly imagine to explore life with. Our paths are very well synchronized. Our growth is optimal...." Her relationship with her mother deepens too: *"Mom has a treatment plan that has stalled the growth of her tumor and given her the opportunity to retire. Being in Calgary has brought us closer. I feel much more grateful and aware of the love she has for me."*

As a nineteen year old woman, Marsha is constantly developing. She begins to be more open in her communication with her boyfriend, and more aware of her continuous work on herself.

We both opened up about our expectations and assumptions. Our conversation was almost an argument. We discussed how we each felt and discovered ways in which we struggle to communicate. ...After a lot of discussion we each began to understand and

forgive each other. I learned the necessity of asking. I feel wiser now...The warm fluctuating sensation that is contained within my body is flourishing. I have seen myself grow and take risks that would not have been imaginable even a year ago. I feel as though I am pursuing my life's work and that I can be genuine. There is still more exploration to be done but I am willing. I AM NOTHING SPECIAL BUT EVERYTHING TOO.

At the end of her interview, Marsha explains the idea of “turning inward,” which she had also written about in one of her diary entries. She says,

I am really into the idea of wintering now. A time of incubating and figuring everything out. I am really excited about that. For a while I was kind of down on myself, because I was not writing as much as I should be. ...But now I love the idea of incubating of myself for a while.

This process is a sign of her growth characterized by a moment of withdrawal from her daily routine in order to re-charge herself with new energy and new solutions.

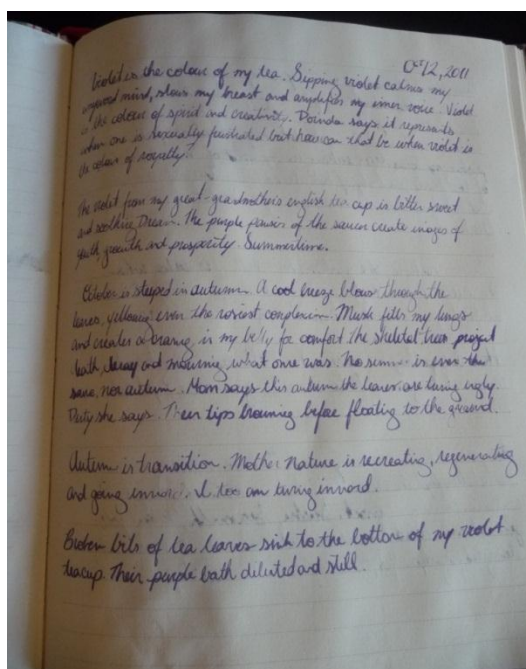
Pattern Model of Creativity

Marsha is fascinated with the spiritual problem of the mind-body connection and is trying to figure out a solution to it. For her, art is the only way to use both mind and body at once.

It happens in my writing and in my art too. Sometimes, I feel like I am connected to some form of energy, like this “Chi” energy. I just feel like a stream going through everything, like invisible but you know that it’s there. You just feel it. It just vibrates.

Recently, Marsha discovered a new way of expressing herself through writing:

I'm journaling another night. I'm just starting to write with an ink pen... When you write, you contemplate more when you do it by hand because your speed is not there. I'm just starting with a purple pen and I'm drinking a purple tea out of a purple cup. My mom gave me my grandmother's cup that she brought from England. I'm just writing with purple pen. Purple represents creativity and spirituality. During that day, it was almost like a bolt of lightning right here and then I felt it in my eyes and that hurt me so badly. I took Advil and lay down. When I woke up I felt so sensitive, so insanely sensitive to just everything around me. I felt like a vibration. I was so alive that it was almost scary. When I was writing this I started realizing that the pain that I had felt was like a general body pain that happened to all women throughout history and that was connected to Mother Earth. I started relating that the pain that I am going through is like the pain Mother Earth is going through—all the transitions, earthquakes, these natural disasters.



Chaos – The Differentiation Period

Before starting her writing, Marsha assembles the purple ink pen and the purple cup that her great-grandmother brought from England, which has now been passed down to Marsha. This cup is a family treasure and has a special meaning for Marsha. She also prepares some special purple tea that calms her mind and amplifies her inner voice.

While collecting these items, Marsha has had time to gather in her mind images and thoughts about the women in her life, her feelings of love and acceptance toward her mother who has suffered so much throughout in her life, and her spiritual knowledge about the meaning of colors. Marsha is sensitive to everything around her and feels a strong current of energy going through the back of her head that creates an excruciating pain in her eyes. She needs a rest and decides to take a nap (Figure 58).

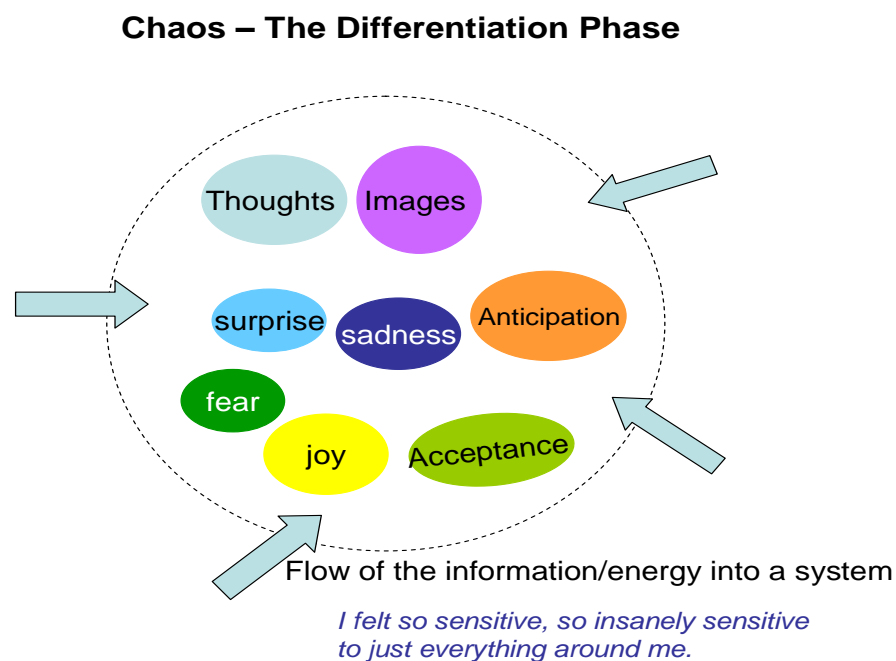


Figure 58 The differentiation phase of Marsha's creativity

Complexity - The Integration Period

During the nap, free from rational direction, her thoughts, images, memories, and feelings combine and organize into completely new, unexpected, and complex patterns or configurations that are waiting to emerge from her unconscious (Figure 59).

Complexity – The Integration Phase

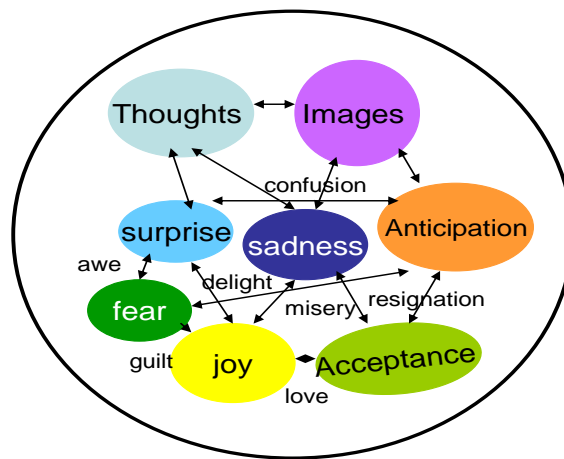


Figure 59 The integration phase of Marsha's creativity

Creativity - The Flow

When Marsha wakes up, she feels extremely sensitive and alive. Activated complex emotions combined with thoughts and images act as a flow of energy going through her, becoming a driving force for her creativity. Marsha dissipates this cumulative energy through her writing. Her writing can be compared to the “dissipative structures” whose existence depends on the flow of energy (Prigogine, 1980; 1997) (Figure 60).

Creativity – The Flow

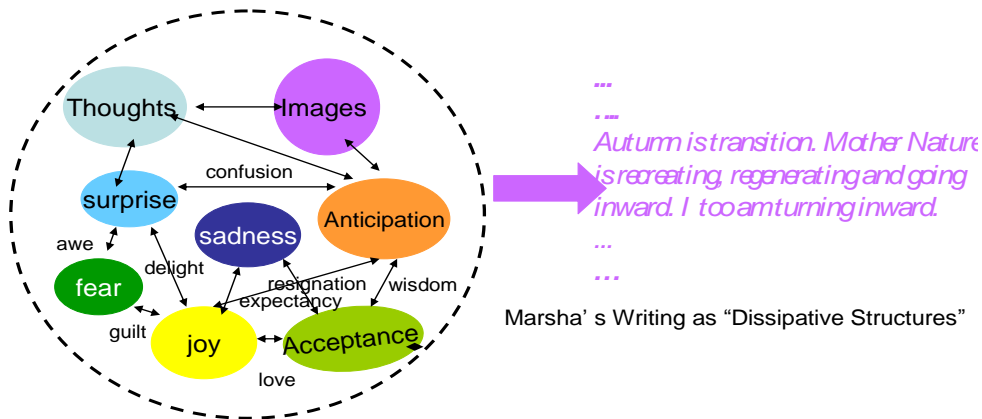


Figure 60 The flow phase of Marsha's creativity

Marsha writes during this unusual experience:

Autumn is transition. Mother Nature is recreating, regenerating, and going inward, I am too turning inward...Now, this third week of October my energy shifts. Mother Nature is moving me. The silence of her engine turning the current of her rotating body, the circular momentum of her rotations washes over me. At times, she tests my connection pulling and pushing my loins. Cries evoking in my mind of self-destruction of the female pain body, of her abused skin. Cries of the earth and her guardians. Tears press on my sockets. Pushing for the brink.

Mother Nature, she questions her worth, her value when the audience has stopped listening and calls for her 40 hits while she pours out her heart during a B-side track.

How I empathize her sorrow, her little white snow white journey. To be more, to give more, yet take none.

*Her pain echoes across my mind “I have nothing to bring to this relationship” she cries.
No talent, no material good, yet I continue. Sunrise-Sunset, Sushi, Sexsmith, Blow jobs,
journalism, dried tea leaves, and knit mittens that reach past elongated fingertips. Yet,
tears dry and the cries stop.*

At the end of this process, she feels completely surrounded by Mother Nature and enormously fulfilled. She sits back and thinks “OK! This is what I want to do.”

Our connection is clear.

She writes through my quill.

Guide me on your path oh’ Sweet Mother.

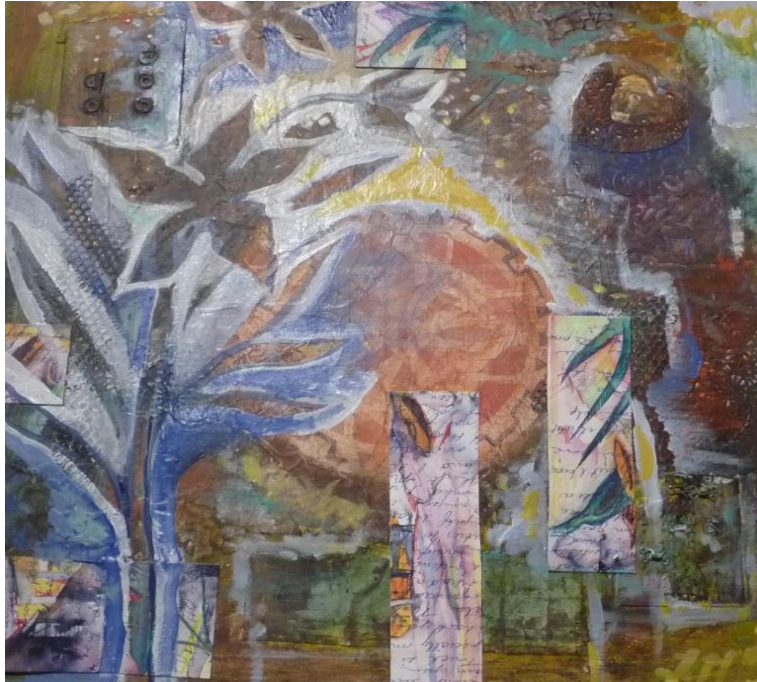
Show me your way. Make my eyes yours.

My feet yours, my heart yours.

Fill me with your intention, intuition.

I am your vessel.

This is Marsha’s “awe” moment, her eye-opening experience. She knows that this experience has opened her up to something powerful. She lets it happen and is surrounded by this creative process. “It is my new process,” she shares.



Jade – The Artist / Art Teacher

Next, I would like to introduce Jade who I met at the Art and Soul Gallery in High River during the Alberta Art Days of 2011. She was demonstrating her techniques to the people visiting the gallery. I asked her if she would like to share with me her experiences as an artist and as an art teacher.

Early Life Experiences

Jade's relationship with her mother is very important to her. She says in her interview:

When I look back on my life, my mother and I did not always get along all the time because we are very similar. We were always butting heads. Now in my thirties, I feel that we have a relationship that is not just mother-daughter, we are friends.

Jade's mother grew up in the fifties and had a tough childhood. Jade comments that she was not sure if her mother was really loved growing up. Her mother promised to give Jade the childhood she never had. Jade says, *"I am sad to hear that she did not have a good childhood, but I thank her immensely for the amount of stimulus that she gave me when I was a child."*

Jade remembers digging in the garden, growing plants, connecting to nature and hiking. Her father instilled in her a love for drawing and painting, and her mother introduced her to more organic and natural things. Jade shares with me:

These experiences and also music set a bar for my expression, because I was surrounded by them. If you are more exposed to these experiences, you want to push boundaries to see more. I think this translates to my teenage years and how I am now. I was a very stubborn teenager...I am pretty calm now. I am scattered in the sense that I want to do so much but I am still grounded. I am very determined and sometimes I can get myself into trouble. I try to be open but sometimes I am so passionate that I can see only one thing.

Her art teacher from high school, Ms. M., had a huge influence on Jade's life. She had a special after-school program in her art room which was always open to kids seeking help.

Jade reveals:

I feel that if she did not help me, I would have gone in a totally different direction. I could have been the one who was pregnant or doing drugs, or getting into trouble...It was a kind of weird relationship because you either loved or hated her. Some students did not get along with her. She was very strong willed and did not put up with anything. She had a desk with many trinkets that she constantly changed. I became an art teacher

because of her...I wanted to continue her legacy. I arrange my desk with funky little things just like her, and try to have a good sense of humor like she had.

As a teacher, Jade understands that teenagers can get bored very quickly and are looking for attention and acceptance. This is why so many teenagers form groups, very often bad groups but at least they have something to attach to. This is why a lot of high schools are encouraged to organize clubs or teams that keep teenagers from getting into trouble. She says “*We try to create a safe haven for developing some talents that they have.*”

For Jade, making the decision to become an artist was easy because she was encouraged by her parents. She describes herself as lucky and blessed that she found her passion so early in her life.

As a teacher, she realizes that many students don't have direction.

I have a hard time with parents saying 'It is OK that you don't know what you want.' I get a little frustrated. You need to start to figure out who you are now. You have to find something that you love and the money will follow. If you have a passion for what you do, you will be driven. I push them to do research and ask them to find avenues they are passionate about. What job can you do by integrating all of your interests?

Process of Creativity

"I don't think that I can live without it.

It is so essential to everything."

Jade feels that art is a great way to deal with emotions like remorse, sorrow, and grief.

I come to the studio and my emotions flow to the canvas...Like the piece I have on the back wall, with a blue bird and two leaves with threads. This piece is about my grandmother. I can't sell it because she was the closest person in my life. It is amazing how many people come to my studio and want to buy that piece. I think that they are connecting to how much energy I put into it.

When I asked her how she created this piece, Jade said to me:

I could not paint any single piece about my grandmother until two years after she passed away. I tried and tried and then one night I woke up and I painted for a whole weekend non-stop and put all my emotions into the piece.

Jade puts her personal experiences into her canvases. There are images of landscapes based on her travels through Canada, and flowers her students hand-picked and drew. There are a lot of layers in her work, negative and positive spaces, Victorian pictures and fragments of her writing. She feels good about them. This is her life, what she has gone through.



As an artist, Jade struggles with the art curriculum. She says, *“You can teach about artists from the past, but they [the students] also need to do art to connect to life so that they can learn more about themselves.”*

Jade really emphasizes the importance of keeping a journal for the purpose of self-expression. She is also attending a journal class for women in their fifties, sixties, and seventies who are not artists but are engaging the creative process. Some of the women, Jade thinks, still don’t know who they are and do not know what they like.

“I don’t hold back, I just do it!” Jade says. *“In fact sometimes we have parameters, but I go around them because I want to do more.”*

People describe Jade as a person who can’t sit still. She is always active. In only two places—in her grandmother’s house and in the mountains—is she able to let go and simply be herself. *“My studio and garden are solitude but in different ways because I am still moving and thinking,”* Jade says.

Meaning of Creativity

“I don’t think that I can live without it,” Jade quickly responds. She explains further:

It is so essential to everything, because it’s not just in my painting. It’s in the way I organize my furniture, in the way I dress, and arrange my flowers. When I go to my garden to cut fresh flowers for people, I am thinking about who they are, what flowers they like, and how to assemble them. I am looking at the textures, the twigs, the whole aesthetic experience. I take this same kind of response in my painting—looking at texture, color, negative and positive spaces...

In Jade’s life, music plays an enormous role:

I could not do art without music. I always play music when I am painting. I grew up with music. My best friend was an accordionist. When we’d come back from school, she would practice the accordion and I would paint. I find myself now, in adulthood, going to clubs and painting when I am listening to live music.

Psychological Development

To analyze Jade’s psychological development, I applied the spectrum-emotion theory.

Since her childhood, Jade has been exposed to a variety of stimuli such as gardening, hiking, various artistic activities, and music. These stimuli evoke emotions of *joy* and *surprise* that self-organize into the secondary emotion of *delight*. Delight can be understood as a feeling of complete connection to the sensible natural world and the desire to assimilate this new experience that is referred to in the emotion of *acceptance*. Jade was also a very *curious* child. (“I think that every child has a sense of exploration, looking under a rock out of curiosity. I

always wanted to get to the top of the mountain.”) Thus, curiosity that includes *surprise* and *acceptance* opened her up to new experiences, and was essential to her creativity.

The pattern of emotions attracts images or thoughts in order to form a complex system called an affective-cognitive structure. In this system, emotion guides the perceptual and cognitive processes. In Jade’s case, emotions have an enormous influence on her artistic practice. By combining her emotions with mental images drawn from her trips, and from hiking and gardening, Jade creates beautiful paintings that express her *love* for nature (*“If somebody told me that I could teach horticulture and art, nobody would believe me that I have this ideal job that fits both sides of me.”*) Jade loves both art and nature. Love is understood as a secondary emotion of joy and acceptance.

Jade becomes even more engaged, caught-up and fascinated. She is deeply involved in the artistic pursuit. *Interest/anticipation* plays an important role in holding her attention and in maintaining her focal awareness. *Interest* combined with *acceptance* generates a *resourcefulness* that enforces her imagination and originality. And *interest* joined with *joy* creates *optimism* and *expectancy* (Figure 61).

Jade’s Emotions

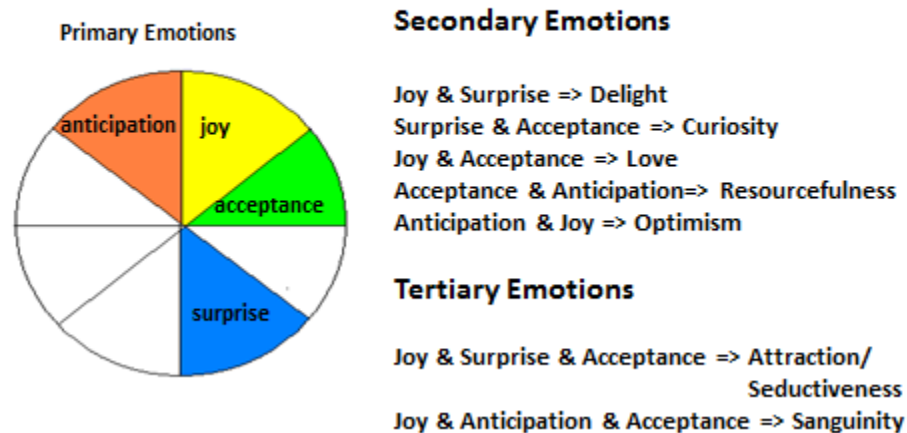


Figure 61 Jade's primary, secondary and tertiary emotions

Multiple occurrences of complex emotions or emotion-thought sequences lead to the stabilization of an affective-cognitive structure, and the self-organization of the traits of personality. Jade believes that her development as an artist, a teacher, and a human being are joining to and transitioning into each other. Jade becomes a *resourceful, optimistic and sanguine* individual who is prepared to carry out action intended to realize her goals:

My goal is to have a ranch someday, it comes back to my teenager years, to my feelings of being mentored. I want to help people...Money and superficial things don't matter. It's about making a difference, and that you are helping people. Having a goal like the ranch has pushed me in different directions, to put more feelings into the paintings... I look at this ranch as a journey that I am going to enjoy.

She is a person with a highly positive self-image and a strong positive identity. As a sanguine individual, Jade is interested in other people and experiences empathy in dealing with them.

Huge, huge [empathy], in fact I am sometimes a little bit too emotional. But it's important because if you don't connect with people you don't have those common bonds that make the beautiful stories that are life. You want to help, but you pick and choose your battles. I tell myself, I am a teacher in high school where the kids struggle to survive every day, and I am doing the best I can and that's all I can do right now.

She is also intuitive and high-spirited.

I have feelings and I listen to them...I have never been wrong about my emotional instincts. It comes from paying attention and listening. I just hear it and just go with it.

No hesitation. It has not steered me wrong, so far. I think that it is about taking a risk and not being fearful.

Because of her highly positive experiences in her childhood and adolescence, Jade is well-equipped to face the world and well-prepared for her professional and personal life. Her experiences have promoted the healthy development of her brain and body, great social skills, highly developed cognitive abilities, and emotional and spiritual development (TenHouten, 2009) (Figure 62).

Jade's pattern of emotions during her life

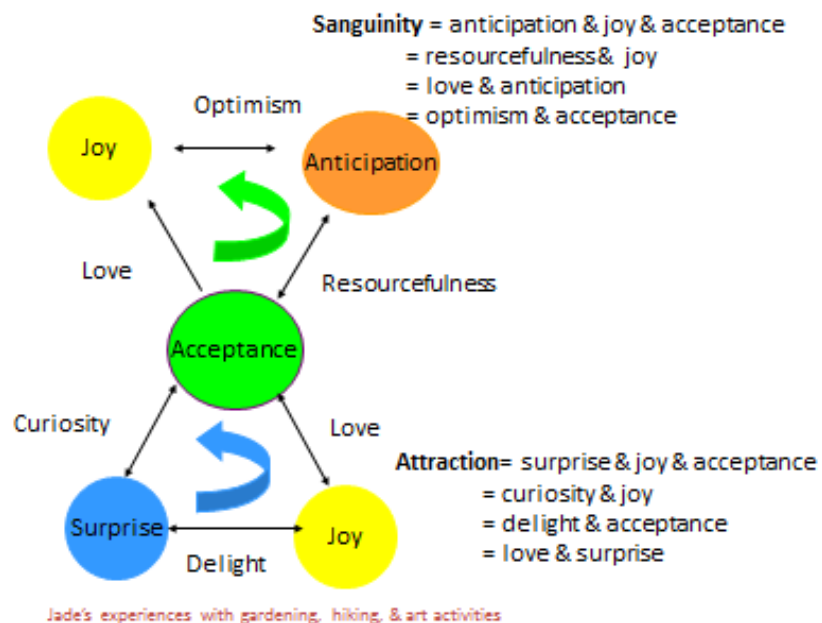


Figure 62 Pattern of emotions during Jade's life

Whole Aesthetic Experience

I don't think that I can live without it.

It is so essential to everything because it's not just in my painting.

It's in the way I organize my furniture.

It's in the way I dress.

It's in my flowers and how I arrange them.

When I go to cut flowers from my garden to give to people,

I am thinking about who they are and what flowers they like...

I am looking at the texture.

I am looking at the leaves.

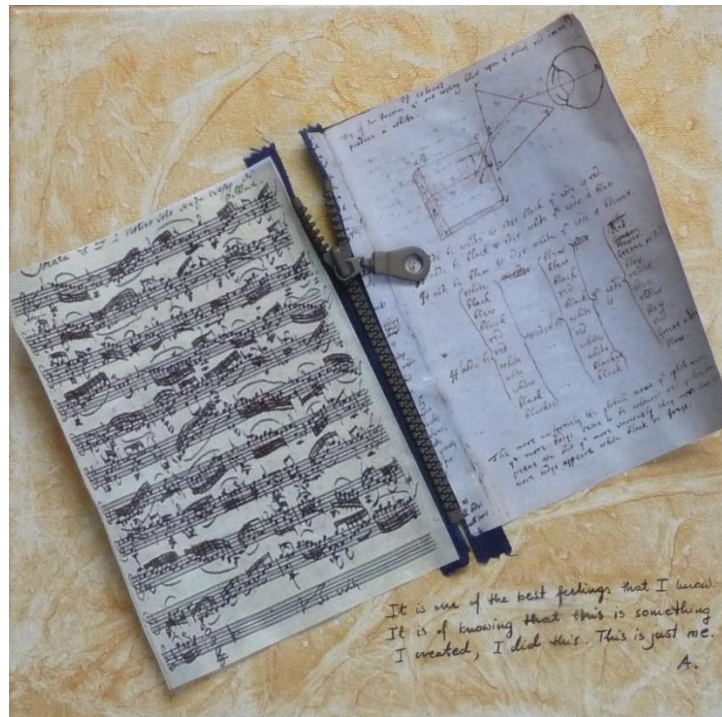
I am looking at the twigs, everything,

I am not just looking at the flowers but at the whole aesthetic experience.



Alasdair Mac Ewan – The Young Composer

I conducted my interview with Alasdair Mac Ewan, a nineteen year old graduate of Westmount Charter School, in the office of a friendly teacher who informed him about my project. I have learned from his teacher that Alasdair is a special person who has the ability to combine many interests, like music and science, to produce very interesting school projects.



"It is one of the best feelings that I know.

It is of knowing that this is something I created,

I did this. This is just me."

Development through Theory of Positive Disintegration

To study Alasdair's psychological development, I have applied the concepts of the theory of positive disintegration combined with the affect-spectrum theory.

Developmental Potential

Social Factor

Alasdair's parents were never married. His mother was eighteen when she gave a birth to him. For a few years he and his mother lived with his grandparents. Alasdair reveals,

I had always been very close with the three of them. Not so close with my father. I did see him every other week and spend a day with him on Sunday. It was trouble for him and I never really enjoyed it because we never did anything that I wanted to do. I have always been very close with my mother. And a lot of it is because we are both very similar. We often have conversations that other people would not be able to follow.

When Alasdair was seven or eight years old, he took piano lessons, but he quit them after two or three years:

I decided I didn't want to play how my teacher wanted me to play. I wanted to play how I want to play. It was not worth taking lessons. So I stopped taking lessons. In grade seven, eight, and nine, I was in a band. In grade ten I was in choir, jazz band, and orchestra band.

Overexcitability

Alasdair's developmental potential is rich in three forms overexcitability (OE): emotional, imaginational, and intellectual, which can be seen in a variety of interests, including music, science, and mathematics.

The signs of Alasdair's emotional OE are:

- Excessive shyness (*"I always have been quite shy."*),
- Fear (*"I was always scared of what I might do...It was often a very unspecific fear. It was not a fear of something, I was afraid in general."*),

- Depression (“*I was feeling depressed. We ended up going to see my doctor and starting to get treatment for depression.*”),
- Feeling of loneliness (“*I never had many friends. I never really had a best friend until probably fifteen or sixteen.*”),
- Need for acceptance and security (“*Students here kind of embrace strangeness....The teachers here were amazing and understanding and genuinely nice people, as opposed to the teachers from my older school. And it made a big difference.*”), and
- Exclusive relationships (“*I always have been very close with my mother.*”).

His tendency to dream can be a sign of enhanced imaginal OE (“*I dream a lot...all the time...it is a little bit of an escape for me, just thinking about different problems.*”).

And finally, the diversity of his interests, which include music, science, mathematics, and writing novels, are indicators of his intellectual OE (“*I always have been interested in things that no one else seems interested in.*”)

The Unilevel Disintegration – Early Adolescence

Alasdair’s early adolescence can be described by the unilevel disintegration level of the theory of positive disintegration. Because of his enhanced *emotional overexcitability*, he experienced strong fluctuations of opposing feelings, intense highs and lows of mood, and conflicting courses of action. He also experienced forms of depression related to the feeling of inferiority, shame and guilt, fear of death, and suicidal tendencies (Dabrowski, 1970, p.79).

Alasdair played many instruments in band but he never knew what he really liked. He said:

I never could decide what I like. I started off with bass clarinet, then French horn, bassoon, and most recently tuba. I also bought several instruments on my own, taught myself guitar, trumpet, flute, and viola. I took organ lessons for a while.

His shifting moods were diagnosed as symptoms of bipolar disorder. During our interview, Alasdair said that *“grade ten was a pretty horrible year for me. It was because I was either depressed and I didn’t want to think about school work at all or I was manic and I could not concentrate at all.”*

Emotions

During the period of early adolescence, Alasdair felt

- Anger (*“When I was younger, probably in my early teens, because of depression, I would get angry very quickly, which caused me nothing but trouble.”*),
- Fear (*“I was always scared of what I might do, especially, when I was having suicidal thoughts. It was often a very unspecific fear. It was not a fear of something, I was afraid in general. Something would trigger in my brain that said I should be afraid.”*) and
- Rejection (*“I used to feel rejected by my friends because they would find new friends and then I would be forgotten.”*).

Emotions of sadness and rejection create secondary emotions of *loneliness* and *misery* (*“I never really had a best friend until probably of fifteen or sixteen.”*)

Emotions of *shyness* and *embarrassment* are experienced when fear joins sadness (*“I always have been quite shy.”*), and *dislike* is a secondary emotion of rejection and fear (*“In grade seven I did not like any of my teachers.”*) (Figure 63).

The Unilevel Disintegration

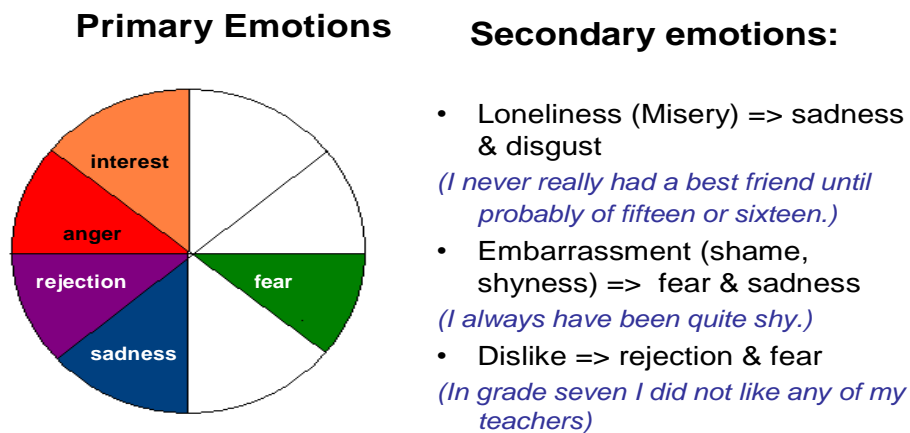


Figure 63 Primary and secondary emotions during Alasdair's early adolescence

Model of Depression

During this time, Alasdair suffered a deep depression. Depression is a state of mind that is characterized by a lack of active exchange of energy between the individual and the environment. It involves four main primary emotions—*distress/sadness*, *anger*, *disgust/rejection*, and *fear*—that interact and combine with each other (Izard, 1977). Distress is the key emotion in the pattern of depression. Anger, disgust and contempt (a secondary emotion of anger combining with disgust) comprise the hostility triad, which represents violent behaviour directed toward the self. Fear acts in the opposite direction. It motivates the depressed individual to remove himself from the distressing situation and serves as a check against excessive inner directed hostility and thus decreases the chances of suicidal behavior (Izard, 1977, p. 320). Alasdair experienced a constant fluctuation between the emotions of fear (protection—moving away from hostility) and anger (destruction—moving toward). Emotions like rejection (expelling) and despair/sadness (losing/decreasing energy) by combining with each other bring a feeling of *misery* or *loneliness*.

The individual feels worthless and the boundary of the self shrinks. During this time, Alasdair felt very lonely (Figure 64 & 65). He says in the interview,

I never had many friends. It's a little bit hard trying to fit in. Other people really didn't care if I fit in...In my old school, being different is probably the worst thing you could be. The teachers, except one or two, just thought that I was lazy and didn't want to do anything...I used to feel rejected by my friends because they would find new friends and then I would be forgotten.

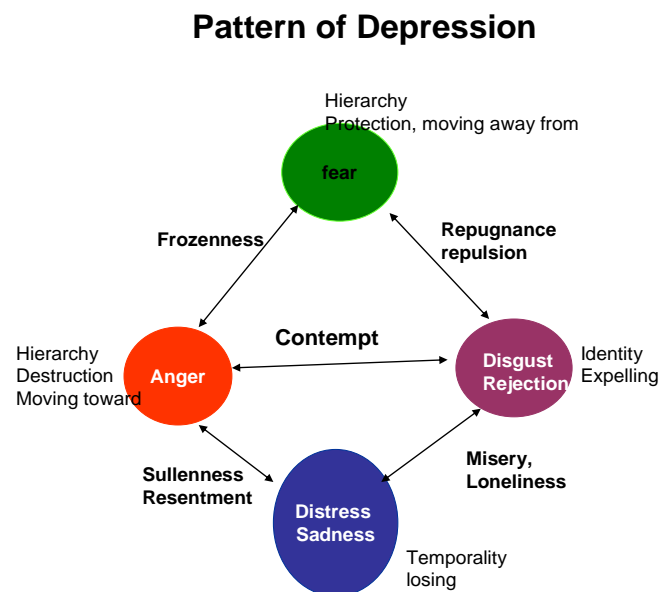


Figure 64 Pattern of depression

Pattern of depression



Anger

When I was younger, probably my early teen, because of depression I would get angry very quickly and it cost me nothing but trouble.

Fear

I always was scared what I would do. Especially when I was having suicidal thoughts, I was very afraid that I would not be able in check and then ...I had to go to talk to my mom because I was too afraid that I was going to do something. It was often very unspecific fear. It was not fear of Something, I was being afraid in general. It was something that triggered in my brain that I should be afraid.

Rejection

I used to feel rejected by my friends a lot because they would find new friends and then I would be forgotten.

Loneliness (Misery) => Sadness & Rejection

(I never really had a best friend until probably of fifteen or sixteen.)

Figure 65 Emotions of depression

In the pattern of depression, the emotion of fear has a very important function. For Alasdair, fear helped bring a positive change in his behavior. When he was afraid, Alasdair looked to his mother for help, who then lead him to get treatment.

The negative emotions of fear, sadness, rejection, shame, dislike and depression produce “psychic entropy” in the mind, a state in which the individual cannot use his attention to effectively deal with external tasks because he is busy using this energy to reflect on himself (Csikszentmihalyi, 1997, p.22). During his early adolescence, Alasdair experienced this mental chaotic state. He could not concentrate on his school work, or he did not have any interest to do it. Even choosing instruments was a problem for him.

Dabrowski (1970) believes that disturbances such as hesitation, mental and emotional disequilibrium, increased sensitivity, and the temporary lack of interest in the outside world are

essential for human development. In these cases the individual is not really aware and conscious of what is going on inside of him, and feels some internal “noise” (Dabrowski, 197, p. 103). But this “noise” is strong enough to make the individual shift his attention inwards.

The behavior of the individual at the level of the unilevel disintegration can be described by the *limit cycle attractor* or by the *two fixed-point attractors* (Laycraft, 2011).

The Spontaneous Multilevel Disintegration

Alasdair’s situation was so serious that his mother and grandmother decided to put him in a different school. One of his grandmother’s friends knew the principal at the Westmount Charter School, “*So we went for this interview and they said: can you start tomorrow? So we got a schedule for me, I came to classes and it worked out great,*” Alasdair shares with me with excitement in his voice.

He was accepted by the students and teachers of his new school.

“Students here kind of embrace strangeness. If you are different, it’s not bad thing, it’s good because you have something different to offer. The teachers here were amazingly understanding and genuinely nice people...People here are more welcoming,” Alasdair reveals.

Acceptance is a strong positive emotion that involves one’s sense of identity. Acceptance refers not only to the acceptance *of* other people—of one’s parents, family members, friends, and others—but also means acceptance *by* others (TenHouten, 2009). Alasdair needed so much to be accepted by others. His behavior, thoughts, and feelings started to change. He became more open to the external and also to the internal world. His energy started to flow and create new and

healthier patterns of thoughts, feelings, and behavior. *“I hadn’t been seeing a psychiatrist for a while. So I was better. It’s been much better here than it was,”* Alasdair shares.

Alasdair was escaping the dangerous “circular attractor” of his behavior and was bifurcating to a new mental state that can be described by the level of the spontaneous multilevel disintegration. The spontaneous multilevel disintegration defines an extensively differentiated mental structure, governed by intrapsychic processes. The boundary of the self is starting to open and expand, and there is an active interchange of energy between him and the external world. Alasdair here starts to experience new emotions like *interest, acceptance, friendliness, curiosity* and *creativity*. Because he feels accepted by other people, he opens himself up and starts to accept other people too. He experiences the secondary emotion of friendliness, which is a combination of acceptance and joy. He reveals:

I met a friend online and we got on right away. We are pretty much like brother and sister. She is down from Georgia in the USA. This Christmas I am planning to visit her and her fiancé for two or three weeks. But it’s still not the same. I can’t go for coffee with her. Even if it is a great friendship it will be better when we are closer.

He also opens himself up to different areas of science and art. In grade twelve, he was able to combine a variety of his *interests* into interesting school projects. One of the projects was about paralleling the development of physics with the historical changes in music

“I start from Aristotelian physics, and compare it to Renaissance music,” Alasdair explains. *“Then I get to Newton and compare it to Baroque music, and end up with twentieth century music being very strictly ordered but seems chaotic and then we have the same thing in physics—modern physics, complexity science that nobody understands.”*

His *curiosity* for different things includes a component of *surprise* (an interest in unusual things) and a desire to assimilate new information, which is referred to as *acceptance*.

Alasdair started studying at university, but after some experiences there he decided to take a year off. He experienced internal conflicts in regards to his studies:

First I was studying music and mathematics. I talked to some of the people from the music department trying to get opinions or criticisms on stuff I am writing. The main response I got was: 'Nobody writes like that anymore. We all write in a modern style.' I decided that maybe the music department at U of C was not the place for me. So I transferred from music to linguistics. After doing a term of math and meeting a lot of professors because I was in the math club there, I discovered that I don't like mathematicians from there. They seemed to not have any personality, so then I moved from mathematics to physics.

These internal conflicts result when the individual becomes aware of the opposition between needs, values, and interests (Dabrowski, 1970).

During his middle and late adolescence, Alasdair experienced some dynamisms like:

- 1) Astonishment with oneself, which is the first phase in the authentic observation of oneself (“*I often stop and think back and wonder, was that a valid thought? Was that something that makes sense?*”);
- 2) Dissatisfaction with oneself (“*I see more flaws in myself than I see flaws in others. It constantly leads me to think that they are better than I am. Not good, but it's hard to change.*”);
- 3) Shame (“*Walking down the hall, I feel ashamed for no reason.*”); and

4) Guilt (“I was taking to my friend the another day. He was being silly about something and I told him off. Later I went back and apologized because I felt guilty about it. The guilt was strong enough that I had to apologize.”) (Figure 66).

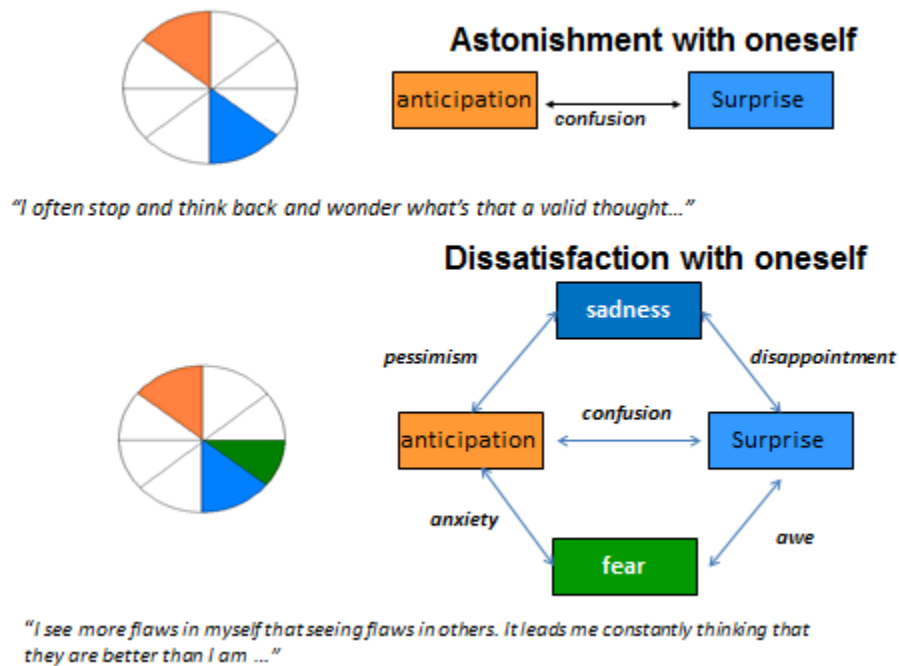


Figure 66 Dynamisms during the middle and late adolescence of Alasdair

Izard (1977) writes that in feeling shame an individual experiences a heightened degree of self-consciousness and self-awareness. Shame creates a psychological instability and the boundary of self becomes more permeable. The instability and permeability of the self in shame provide a strong motivation for the individual to want to know himself. Thus one of the positive functions of shame is to increase self-knowledge (Izard, 1977, p.410).

Guilt occurs in situations where one feels personally responsible for something, and it stimulates a great deal of thought as one begins to reflect on the wrongdoing and how she can set

things right again. The emotion of guilt plays a role in the development of personal and social responsibility (Izard, 1977, p. 427).

During his middle and late adolescence, Alasdair is actively involved in creative activities. He composes music and writes a novel.

Since grade ten I have been writing music and keeping track of my writings,” Alasdair shares with me. “After a while people told me that they were pretty good. So I decided maybe I should try to do some more. It turned out that they are not so bad. I guess that I am creative but I never thought of myself as creative.”

Alasdair’s creativity arises from his enhanced intellectual, imaginal, and emotional overexcitability. According to the theory of positive disintegration, creative development is not possible without psychoneurotic dynamisms that act as loops of positive feedback by pushing the mental structure further into a far-from-equilibrium state, which can be described by the chaotic attractor (Laycraft, 2011). This state is a necessary condition for the self-organization of young persons’ mental structures into more complex and ordered states.

Process of Creativity

Chaos –Differentiation

The first phase of Alasdair’s creative process is finding the proper idea for a composition. Quite often, he struggles with choosing the best fitting idea.

To my question about daydreaming, Alasdair responds with a laugh:

Yes, all the time. It is one of the things, I can be doing something, but at the back of my head I am thinking about something else. It will be entirely unrelated and very scattered where I go with an idea, and I jump to something new without warning and continue for a while before jumping to something new again. Sometimes, it is a little bit of an escape for

me, just thinking about different problems. Yes, I dream a lot. It's got me in trouble before. People ask me, are you listening to me? I don't even hear them sometimes. I was somewhere else.

Alasdair mentions that during his dreaming, his mind jumps from one idea to another, and I wanted to know if his process of composing is similar. He agrees and explains:

I don't finish many pieces. At least I haven't yet. I will be working on one and suddenly I'll be getting idea that will not fit with what I am doing and I have to save that one for another time and start something else trying to work through that idea.

When I ask him about the source of his ideas, Alasdair answers:

It depends on the piece. I took an idea from a piece of Bach. Another is from folk music. This one is expressing the movement of a cat, connected with Eastern European folk—or another one is a waltz, or could be jazzy or bluesy...

Complexity - Integration

The next phase is to integrate these ideas. He describes that

If I really want to work on one, I often just open that and listen to it a few times and see if I can pick something that I can take an idea from. Once I start a piece I am not trying to pull ideas from outside, but I try to pull ideas that are already there. You can get a more cohesive composition that way.

Alasdair shares with me that he has a big problem with perfection, which often leads him to become very frustrated. *"If it is not perfect, it is not good enough, which often leads me to not be able to finish a piece. Often I am not sure how to finish it so that it will be perfect."*

Alasdair finds that writing words is much easier than writing music. *“With music I have a lot of trouble putting it down and saying ‘This is good enough.’ With writing I don’t worry quite so much.”*

Flow – Circular Causality

Near the end of the creative process, Alasdair feels what is the right thing to do.

“I can’t do much by pausing and thinking about where I am going with it,” Alasdair says. *“It flows easily when it’s working but it’s hard to explain.”* After finishing a piece of music, he feels satisfied and it is the best feeling that he knows. He says, *“It is a combination of knowing this is something I created. This is just me. It maybe draws me back to it.”*

Creativity for Alasdair is a kind of compulsion. *“It’s one of those things that is just not right if it isn’t written. I want to do it because I want to create something. I have a kind of compulsion to do this,”* Alasdair says.

Final words

My interview with Alasdair was six days after the Stanley Cup riot in Vancouver. I asked him how he felt about this event. He told me that he was

Disappointed because we are better than that. I have a sense of disappointment in my fellow people. I tend to have a very poor view of humanity. I think that in general we are pretty crappy species. We kill each other for any good reason. We go out and do horrible things and then we make excuses for that. We go out and destroy beautiful things in nature all the time and then put ugly things in their place. And I think that something like this would conform to my thoughts about people. Some of the reactions afterwards when people were going and volunteering to help out and repair things alleviates some of that. But it still leaves a little bit of a bitter taste in my mouth.

Anne Taklea – The Artist / Activist

Finally, I would like to present the life of professional artist Anne Taklea. Her story consists of a fascinating transformation from a life that was turbulent and traumatic into one that is a satisfying, complex, caring, and peaceful life. She went through a very difficult period of adolescence and a challenging period of young adulthood as she searched for meaning in her life. Fortunately, she found her vocation as an artist, thus fulfilling her desire for meaning and significance.

Psychological Development

In order to analyze Anne's psychological development and creativity, I combined Dabrowski's theory of positive disintegration with the main principles of self-organization and various theories of emotions.

Developmental Potential

Social factor

Anne was raised in an unhappy home in the fifties. Her family experienced a lot of financial problems. She was the oldest of five siblings and actively helped her mother and her aunt with domestic chores, which included babysitting her younger siblings from a very early age. Her parents were very strict: she couldn't date until she was sixteen years old, and her father often resorted to physical punishment for disobedience.

Anne's developmental potential is rich in emotional, imaginal, intellectual, and psychomotor overexcitability, with above-average abilities in many areas.

Overexcitability

- Emotional (*"I was a really sensitive kid. I used to cry a lot. I just remember crying a lot, having a lot of fun, a lot of laughing, a lot of playing, friends, and also crying a lot. I don't understand why I did it, but I always did. I was very sensitive, hypersensitive."*)
- Imaginational (*"I like to imagine scenarios; the worst-case scenario was what would happen if women were destroyed—what it would be like if all got murdered and disappeared."*)
- Intellectual (*"I was looking at the poet Gaston Bachelard who wrote a book called 'The Poetics of Space.' I practically memorized that book. I thought that it was so relevant to me."*)
- Psycho-motor (*"Very athletic. I did a lot of sports."*)

From childhood to young adulthood, Anne expressed above-average abilities in many areas:

- Musical ability (playing piano),
- Drawing and designing abilities (during her stay in South America, Anne worked as a designer of local products),
- Intellectual ability (writing and performing short plays for the Women's Action Collective on Health), and
- Organizing ability (collecting children's clothing and distributing them to charitable organizations).

An enhanced emotional, intellectual, imaginational, and psychomotor overexcitability are also observable in Anne's creative work during her time in South America, and later in her installations called *"The Sanctuary Series,"* her sculptures and installations entitled *"Abyss,"* her sculpture *"Lest We Forget,"* and an enormous number of portraits and drawings of women. Recurring themes of vulnerability and resilience emerge in almost all the images she creates. Anne is still deeply involved in social issues, not only as an artist but also as an activist. In the

early eighties she became a member of the Canadian Abortion Rights Action League, and in the early nineties she worked as a media spokesperson for the organization.

The Unilevel Disintegration

When Anne was fifteen she quit her musical career. She says,

I quit piano halfway through my grade ten of conservatory. It was the first time in my piano musical career that I just felt I couldn't put so many hours into it. I wanted to hang out with my friends. I wanted to be a normal kid.

This desire for a “normal life” corresponds to Dabrowski's second level of development, the unilevel disintegration, characterized by fluctuations of opposing feelings, conflicting courses of action and strong social influences.

Transition from the Unilevel Disintegration to the Multilevel Disintegration

As development continues, the third factor (the autonomous and intrapsychic process) starts to operate and the unilevel disintegration bifurcates to the multilevel hierarchical organization (the spontaneous multilevel disintegration). During the transitional period between the second and third levels of development, the vertical conflicts of value between “what is” and “what ought to be” are observed. This period is dramatic, marked by a sharp turning toward oneself in order to seek solutions within oneself (Dabrowski, 1972). Fluctuations and instabilities in the mental structure, such as inner conflicts, psychoneurotic depression, anxieties, and obsessions play a crucial role in behavioral pattern formation. Through these fluctuations and instabilities, abrupt changes in human behavior can be observed. Even little fluctuations in the system can combine through positive feedback loops and become strong enough to shatter the pre-existing

organization. At this bifurcation point, the disorganized system either disintegrates into chaos or leaps to a higher level of organization. Unfortunately, when Anne was approaching this dangerous period she disintegrated into chaos and tried to commit suicide. She shares in her interview that

a lot of that was about questioning the meaning of life, reading a lot of Tolstoy, questioning Catholicism, and spending a lot of time just contemplating why I am here. At one point, I decided that there is no meaning and took a bunch of pills and fortunately I woke up.

Anne experienced the enormous multilevel internal conflict between “what is” and “what ought to be.” On one hand she was still on the unilevel disintegration because she was looking for her life’s meaning in the outside world, which means that “her essence precedes her existence.” But on the other hand, Anne intuitively felt the higher level of life. She says in her interview, “*Somehow I knew that there was something unique that I had to do. I didn’t know what it was.*” At higher levels, the third factor takes over and the individual shapes his or her own development by intentional acts and free choices (Dabrowski et al., 1970; Weckowicz, 1988), meaning “existence precedes essence.”

The Spontaneous Multilevel Disintegration

The Mechanism of Decision Making

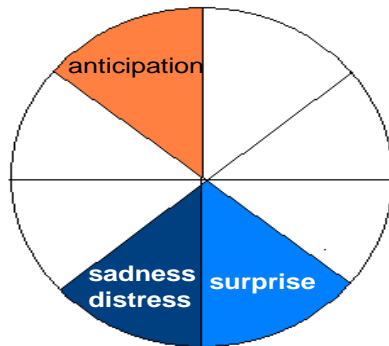
The important decision that Anne made in her life was to go to South America. Anne needed to escape a difficult situation with her former boyfriend who had had a tragic accident in Europe. He was paralyzed and in critical condition. Because of her frequent visits to the hospital and seeing his dreadful conditions, she felt completely exhausted. “*I was escaping this situation. It*

was a very bad decision for me to make at that time. I was still grieving. It was really, really terrible,” Anne shares with me.

This unfortunate event evokes in Anne many emotions such as *surprise*, *anticipation*, *confusion*, *sadness/distress*, *grief*, *disappointment*, and *pessimism*. The emotion of *surprise* prepares her to deal with this new and sudden event and then, by its joining with the emotion of *anticipation* (holding attention), creates a state of *confusion*. A confused person is prone to act very often in a distressed manner (TenHouten, 2009). As a result of the continuous excessive level of stimulation owing to her frequent hospital visits, and the very poor condition of her boyfriend—especially considering the emotional closeness between them—Anne feels enormous *distress*. The presence of distress indicates the potential for corrective action by the individual (Tomkins, 1963), motivating her to do what is necessary in order to reduce distress. Distress combined with surprise creates the secondary emotion *disappointment* which, combined with anticipation, creates *pessimism* (Figure 67). All these emotions are amplified by Anne’s overexcitability and inevitably lead to the internal conflict that creates a far-from-equilibrium state. At this state, the rapid flow of energy links the components of her mental structure into more coherent, higher order forms. These higher-order arrangements create states of self-observation, self-reflection, and self-awareness, which are characteristic features of the third level of development, *the spontaneous multilevel disintegration*. Consequently, this process gives rise to the autonomous forces that help Anne make the conscious decision to leave the distressful situation.

At this point, it is worth mentioning Rainwater’s interesting recommendation (1989) that we should learn to be truly in the present with others, being open to all sort of possibilities and ready to break with past commitments.

Emotions before the decision to go to South America



Secondary & Tertiary emotions:

Confusion = anticipation & surprise

Disappointment = surprise & sadness

Pessimism = anticipation & sadness

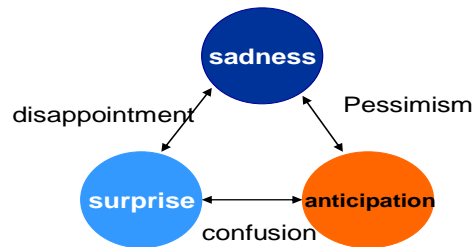


Figure 67 Pattern of emotions before the decision to go to South America

Anne in South America

During her first six months in South America, Anne was teaching children and adults at a Franciscan Mission school in Moquegua in Peru. When her contract expired, she was completely alone. Anne reveals,

I didn't know what to do. I didn't want to go home. It was so weird. I was in so many bad situations and I was getting terribly sick at the same time...almost anything could have happened to me...But I hated being at home so much. I was so angry with my father, angry with my parents that I wouldn't go home. Then I was alone with no money and I was trying to figure out what to do.

Fortunately, she met a man from Buenos Aires, who was working with a group of craftsmen. They were making purses and belts to sell on the street. Anne recounts,

I just happened to offer to draw some designs. And suddenly I realized that my drawing ability was actually pretty good. I was fast and they were very happy with the products that I created. Everything sold very well.

Anne was fascinated by the rich culture of indigenous people, churches and Spanish influences. She was amazed by their wealth of patterns, which she employed in her designs. “All this time learning how to draw....Full time, selling these on the street and making a living by doing that for a whole year,” Anne says.

Anne and the craftsmen traveled through many countries of South America, living in very primitive conditions and often experiencing very dangerous situations. She learned about the situation of the local people and their struggle to survive, and the dark role of the Catholic Church in these counties.

Pattern of Emotions during the Period in South America

Anne’s pattern of emotions during her time in South America was completely different from her pattern of emotions before deciding to leave Canada (Figure 68).

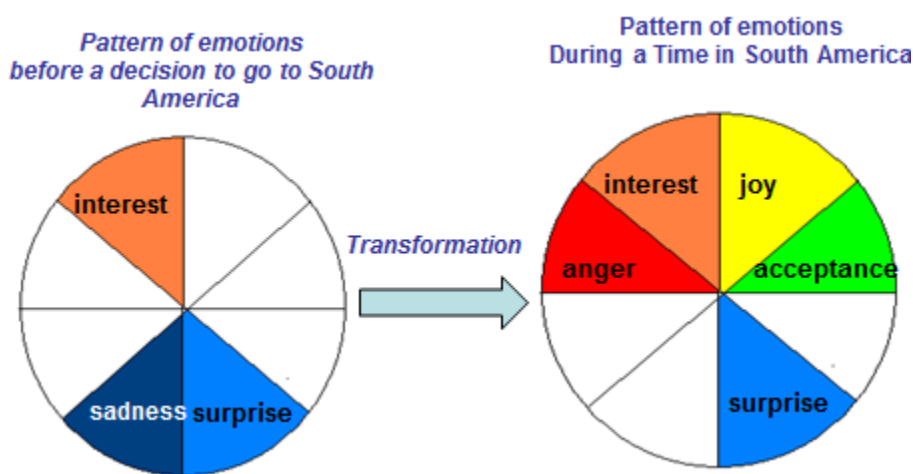


Figure 68 Transformation of patterns of emotions

During her time in South America, Anne realized suddenly that her drawing ability was really good. She was delighted. *Delight* as a happy surprise is a secondary emotion including *surprise* and *joy*.

Being in South America (Bolivia, Argentina, Peru), Anne was exposed to new culture, customs, food, landscape, and so on. She was curious about these things. *Curiosity* includes components of *surprise* and *acceptance*. Acceptance is referred to as a desire to assimilate new information. Thus, curiosity opened her up to new experiences and was essential for her creativity.

For an entire year she was drawing full time, constantly learning and discovering new patterns and creating her own designs. She discovered a love for drawing, for art, and for culture. *Joy* combined with *acceptance* creates the secondary emotion *love*.

A pattern of emotions attracts an image or thought to form a complex system called an *affective-cognitive structure*. Anne's curiosity linked with her interest in and exploration of a new, unknown environment. She became engaged, caught-up, and fascinated with the indigenous culture, the richness of patterns and the Spanish artistic influences. She employed the patterns in her own designs, which had an influence on her further artwork.

Interest combined with *acceptance* generates *resourcefulness*, which means excitement derived from mental discernment. Resourcefulness has a substantial cognitive component as it involves thoughtfulness in efforts to overcome obstacles and to achieve one's goals. *Interest* combined with *joy* generates *optimism*, which is positively related to effective coping and satisfaction (Figure 69).

Pattern of Emotions during the period in South America

Secondary & Tertiary emotions:

Delight = surprise & joy

Love = joy & acceptance

Curiosity = acceptance & surprise

Resourcefulness = acceptance & interest

Optimism (hopefulness) = anticipation & joy

Confident = anger & interest & acceptance
= anger & resourcefulness



Figure 69 Pattern of emotions during the period in South America

Multiple occurrences of an emotion-thought sequence may lead to the stabilization of an affective-cognitive structure and then to expression of the traits of personality.

Through living, working and flourishing in the challenging conditions of South America, Anne demonstrated her enormous resourcefulness and optimism. She became a confident person who was ready to carry out actions intended to realize her goals (Figure 70).

Self-Organization of Emotions during the period in South America

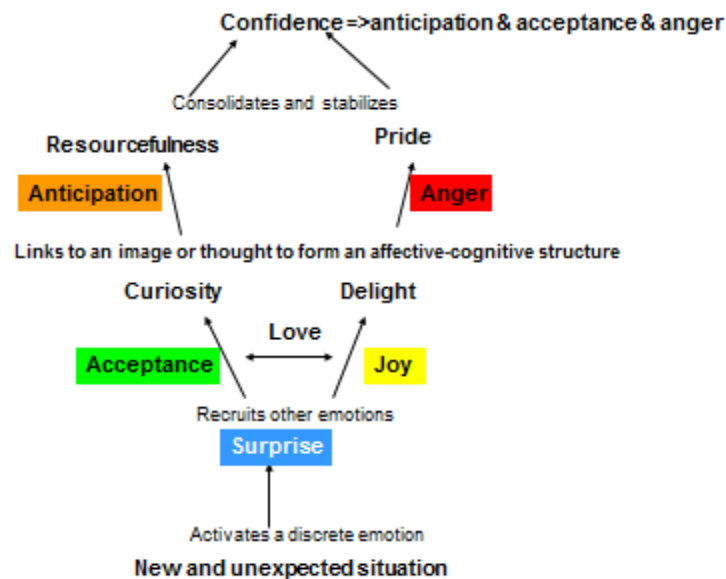


Figure 70 Self-organization of emotions during the period in South America

Returning to Canada

After returning to Canada, Anne finished her Education degree at the University of Regina with specialization in Secondary English and Drama. She started teaching English and Drama in Northern Saskatchewan and later in Regina. She was also a very active feminist at this time, and worked as a spokesperson for Regina's Women's Action Collective on Health Care. Doing all this, she became extremely unhappy. She went deeper and deeper into depression. In her interview, Anne says,

I am not sure why being around people so much made me crazy. I am a doer, so I have always been very enthusiastic about things and am always off doing something. So I got stretched way too thin and burnt really fast. My health was very poor. I had incredible health issues.

Anne was also unhappy with her marriage.

To find out what was going on with her health, she went to a doctor who specialized in preventive medicine.

He diagnosed me as hypoglycemic and put me on a special diet. He suggested that I quit teaching. 'This is not a job for you.' I never thought about it. I had had so many years of training, a job for life, a good pension, and now I get a leave of absence to see if I can get my health back and I decide to go to university...But what should I take?

Anne wondered what to study and suddenly she got an insight:

"Oh! Art. Why don't I try it? I did. I started Art school and it happened for me right away. I absolutely knew that I couldn't do anything else. I just loved it so much."

She started studying Fine Arts at the University of Regina, majoring in painting and lithography.

I got a three year extension on my leave the second year. Then after the end of the second year I just resigned from teaching and took another year of BFA and then went straight to MFA in Calgary.

For Anne, this was the starting point of becoming an artist.

When I asked her about the meaning of her artistic, creative life, she quickly responded:

Survive. I absolutely believe...Somehow I knew that there was something unique that I had to do. I didn't know what it was....It just gave my life meaning. I don't know if I would survive if I had not found this vocation.

Pattern of Emotions Before Starting Art School

After returning to Canada from South America, being a teacher, an activist, and a wife, Anne became over-stimulated. Because of her enhanced overexcitability, she experienced an

abundance of emotions, thoughts, images, and ideas that created conflict, tension, and disequilibrium in her psychic milieu (Piechowski, 1999). Dabrowski writes, “emotional overexcitability may size the whole psychic in a stream of a psychoneurotic process as general depression or anxiety” (Dabrowski, 1996; p.73). This is exactly what Anne experienced. She became extremely unhappy and depressed. *Depression* is a complex pattern of emotions: the more emotions that are activated, the more possibilities for conflicts in the emotion-emotion dynamics. The fundamental emotions involved in depression are *distress* (the key emotion), *anger*, *disgust*, *contempt*, *fear*, and *guilt* (Izard, 1977). *Distress* (sadness) linking with *disgust/rejection* creates the secondary emotions *misery*, *loneliness*, *despair*, and *unhappiness*. This state combining with anger creates a reciprocal dynamical interaction that can be transformed into self-blaming, or into a hopeless attitude toward oneself in the form of self-destructive behaviors, such as suicide attempts, or the use of alcohol and other drugs. It is also hypothesized that *anger*, *disgust*, and *contempt* create the hostility triad, representing hostility directed toward the self and toward others (Izard, 1977). *Fear* has the opposite role in the depressive state. Fear motivates the depressed individual to remove herself from the situation, serving as a check against excessive inner-directed hostility, decreasing the chance of suicidal behavior (Izard, 1977; p. 320). Other factors of depression are decreased well-being and increased fatigue, which are determined in part by the use of energy in the emotion conflicts in the depression pattern (Izard, 1977) (Figure 71).

Emotional Pattern of Depression

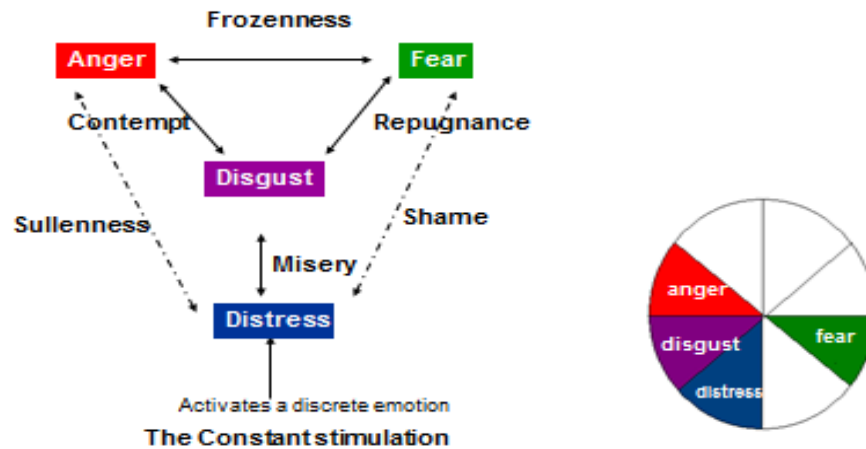


Figure 71 Emotional pattern of depression

Anne also had incredible health issues. She often suffered so severely that she had to be rushed to the emergency ward for help. Finally, she was diagnosed as a hypoglycemic and put on a special diet. The hypoglycemic phenomenon (the phenomenon of low blood sugar), and its symptoms, represents a disturbance that derives from a variety of possible factors, among which must be included the factor of personality disturbance (Rennie & Howard, 1942). In Anne's situation, the hypoglycemic symptoms were probably a consequence of her depression: when she started her studies at art school, Anne's depression disappeared, and consequently her hypoglycemic symptoms faded away too.

Anne's mental state was in far-from-equilibrium, and so sensitive that even the smallest perturbation could have turned crucial. Her doctor's recommendation was a small disturbance that changed her life. She was ready to make the decision to leave her teaching profession and study art instead. It was a large jump to a new higher level of order and stability. Anne loved studying art. She felt that she had found her vocation and her source of meaning in life.

The Organized Multilevel Disintegration

Anne's decision to go to South America, and later her decision to study art, lifted her from the spontaneous multilevel disintegration (the chaotic attractor) to the organized multilevel disintegration (the emerging order). The characteristic feature of the fourth level is the conscious transformation of oneself and the synthesis that leads to increased stabilization of one's hierarchy of values. This level, characterized by lesser tension and a greater ability to systemize experiences, describes the behavior of older adolescents and young adults. Often during this period individuals choose to pursue an interest that will later become the central theme of their lives. This is true of Anne's situation. She finally found her vocation. The result was the transformation of her mental structure into a new ordered state of increased complexity and therefore of increased stability (Figure 72).

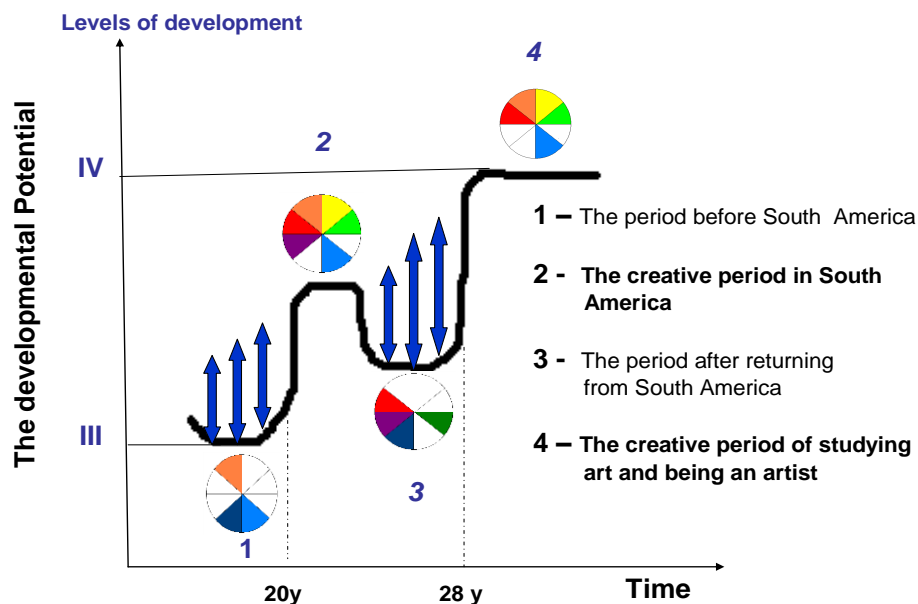


Figure 72 Transition from third to fourth level of development

An emerging order is characterized by a “symmetry breaking” process (a break of the symmetry between past and future) (Prigogine, 1980). A symmetry-breaking process unfolds a new space-time dimension that effects the reorganization of the selfhood process and makes available new knowledge abilities and experience domains (Guidano, 1987, p.68).

Creativity



I absolutely believed

That there was something unique I had to do

But I did not know what it was.

The Creation of the Installation “Sanctuary”

After finishing graduate studies in sculpture, Anne worked for almost six years on an extensive installation called “Sanctuary.” This installation consisted of huge architecture entities, and a partially finished house. She created them in different forms, constantly adding new spaces. “*I turned around and made an environment for people. People could enter, dance, and put on performances. So it was really nice to see that,*” Anne says. An inspiration for this installation was the book “*The Poetics of Space*,” written by French philosopher Gaston Bachelard. Anne reveals in her interview:

I practically memorized that book. I thought that it was so relevant to me. The house, the rooms and spaces in the house are metaphors for the psyche. The installation that I was creating was a part of the meaning that I stumbled on in the book. I felt that his book perfectly encapsulated what I was doing.

The house, for Bachelard, is the place in which one’s personal experiences reach their essence in the form of memories, experiences, dreams, and poetic images.

The “Sanctuary” Anne created permitted her to dream in peace and integrate her thoughts, feelings, and memories. She says, “*they were really, in a sense, a reflection of my desire for meaning and for relevance and for fulfillment essentially...*”

Pattern Model of Creativity

As I presented above, after finishing graduate studies, Anne creates her first significant installation “Sanctuary” inspired by the book “*The Poetics of Space*” by Gaston Bachelard. Her *interest* in and *fascination* with this book opens her to a variety of new experiences and motivates her to create. She *accepts* Bachelard’s ideas completely. Her interest, combined with

acceptance, self-organizes into the secondary emotion of *resourcefulness*. Resourcefulness has a substantial cognitive element as it involves thoughtfulness in efforts to overcome obstacles in the pursuit of one's goals, but it also has an emotional element: it is important in the management of both stress and anxiety (TenHouten, 2009). Anne becomes a highly resourceful person during the process of creating this complex installation. She visualizes the installation and finds a way to accomplish her goal of completing the project. Her resourcefulness includes *self-discipline* (the ability to keep the commitments she makes to herself), *optimism* (the belief that a positive outcome can be created), and a *desire* for meaning.

In the final phase of creation, Anne feels a sense of *fulfillment*, which is a combination of *joy* and *surprise*. Anne *loves* her artistic practice and knows that she would not be satisfied doing anything else.

Joy, surprise, and acceptance, when combined together, creates a tertiary emotion of *seductiveness* or *attraction*. Anne's creativity evokes in her this strong and complex emotion. She is totally attracted to her artistic activities and to all experiences that produce this emotion (Figure 73).

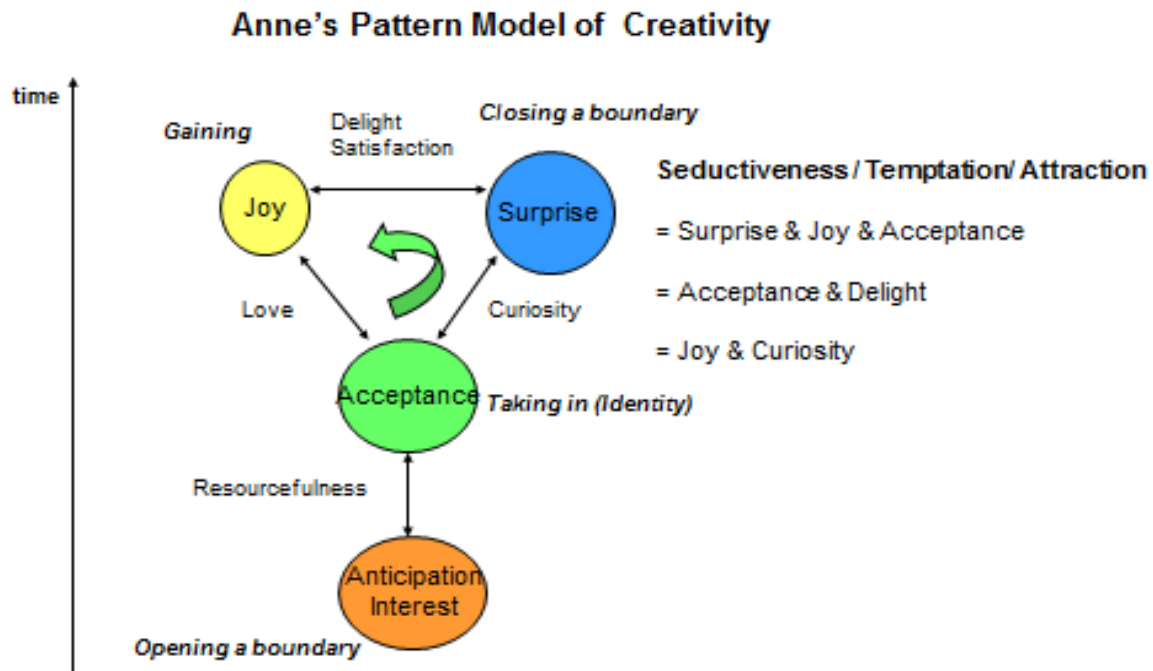


Figure 73 Anne's pattern model of creativity

During this long, six-year period, Anne becomes a *confident* person, prepared to carry out actions intended to realize her ideas in the future. She is prepared to meet all kinds of obstacles and to persist in the face of many distractions and problems. Her behavior required a type of *anger* characterized as "moving toward." She has the ability to remain focused on her future goals and on a set of strategies that could make this future possible (TenHouten, 2009). She feels assured that her abilities and resources are sufficient for her enormous task. Thus, *confidence* is the combination of *resourcefulness* and *anger*.



The Creation of the Sculpture “Lest We Forget”

To analyze the creation of Anne’s sculpture “Lest We Forget,” I applied the concept of bifurcation mechanisms, which play an important role in the process of evolution (creation) (Bushev, 1994). Three distinct stages can be observed in an evolutionary process with respect to bifurcation. They are the pre-bifurcation stage, bifurcation stage, and post-bifurcation.

Pre-bifurcation state

In the late eighties and early nineties, as a young mother of two children, Anne was very sensitive to women’s issues. She found her motherhood overwhelming and felt extremely vulnerable. She says in her interview, “*If I thought I was vulnerable before, it was nothing compared to having children.*”

It was also a time when the Montreal massacre happened. Fourteen women were murdered and thirteen injured when a gunman stormed the Ecole Polytechnique de Montreal. Anne shares:

My daughter was six months old and my son was two and half. At that point I liked to imagine scenarios; the worst-case scenario was: what would happen if women were destroyed...I thought that I would create a series of memorials of women's experiences. I had come up with drawings...I was going to do one on reproductive experiences—not just including birth, but including birth control, or an abortion. I have been a very pro-choice activist all my life. I was going to do another one on women's happiness, or women's work...just different ones.

Bifurcation stage

One day Anne was reading a magazine and spotted an article about murdered women in Canada. A list of over a hundred names and short paragraphs about each of them were included in the article.

Anne's internal state was already in a far-from-equilibrium state in which fluctuations can reach a point of bifurcation. Even an extremely small perturbation was significant enough to trigger a change in her mental state. This article caught her attention and became something meaningful for her. The article brought back emotions and memories from her childhood and early adolescence about her aunt who was abused by her husband. She says in the interview:

One of my mother's sisters—my aunt with five children—had a very abusive alcoholic husband. So when we were growing up, we did not actually witness him doing anything but we witnessed the aftermath, misery and whispers. My parents and my other relatives were trying to help her. Because I was oldest, when my aunt finally had to work, in the

summer, I used to babysit her kids. I was pretty young, thirteen. I was looking after five kids, and two of them were babies....But anyway, we had friends who were raped or abused...

These memories and emotions, joining with her thoughts and ideas, acted as positive feedback that helped her to make a decision. *“As soon as I read this article, I thought, ‘Ok...the first experience has to be the woman’s death.’ That was the first one,”* Anne reveals.

Post-bifurcation stage

Anne remembers,

So I built it and then put it in an exhibition along with another long installation about motherhood called “Abyss.” Again for me, my work is reflected by my experience... It was a sculpture for one hundred and thirty five women called “Lest We Forget.” The phrase “Lest We Forget” is used in Canada when we are referring to the wars, and I look at this as a kind of war, reflective of an intimate war.

In this war, women were murdered by men who claimed to love them.

“It was really hard to do. It was my first experience where art was blending with reality,” Anne explains.

“It’s extremely fulfilling and also extremely emotional demanding,” Anne continues. *“Pieces have followed me throughout my whole life. It was a very interesting experience to the point that I really did suffer a deep depression. It was a great exhilaration and a great depression just because of these stories that I was hearing.”*

Her depression was a result of her closeness to the tragic experiences of other people. According to Dabrowski’s theory of positive disintegration, depression involves different levels

of functions. Anne's depression was the highest level of depression characterized as having an existential and altruistic character, with an emphasized concern for others (Dabrowski, 1972).

As a result of these experiences, Anne grew as a human being. She became extremely sensitive and open to the suffering of women. *"When these things happen,"* Anne says in her interview, *"I never reverse myself from difficult situations with people because I like to be engaging...but this stuff really moved me and I think that it is cumulative."*

The Process of Creativity

Starting a new artistic project is a challenging task for Anne.

"It is a hard time. It is a self-critical, self-questioning time," she shares. *"I am never sure if I can do it. I put a lot of energy into planning. I don't ever know if it's going come out well or not."*

She has to remind herself that, in the past, usually something really good came out of her artistic trials, and so she should have a little more confidence in herself.

Anne spends a lot of time daydreaming. *"My head is always in the clouds. I have no patience for something I am not interested in...I focus on what is going on in my head and what I need to do in my studio,"* Anne says.

When Anne feels that she is ready to start, she works continuously, day after day, without a break. She is constantly thinking about her work.

I am going underground. It means to my friends, I can't go for coffee, I can't go for lunch. I don't want to be disturbed. I have a tendency to push myself to the brink and then pull back, evaluate, and start again.



Outcomes of Creativity

Anne does not connect her creativity with joy.

“It is very complicated,” she says. “I am finding it enriching and fulfilling but I would not say joyous or even pleasurable. It is actually hard work. It is hard work mentally, as well as emotionally and psychologically.”

She loves changing her techniques and themes. Throughout her career she has created sculptures, installations, and paintings of human figures, flowers, and trees.

Currently, she is working on an abstract representation of microscopic ocean life affected by climate change. Her inspiration for this new artistic project is the book *Sea Sick*, written by her friend Alanna Mitchell. Anne is really concerned for the state of the world’s oceans and the destruction of plankton—single celled organisms that are the real lungs of the Earth. Plankton produces half of the world’s oxygen. She asks the existential question, *“How long will we survive if we destroy plankton? What will happen to our children?”* It is a critical issue for her. She plans to spend a year or two on this project, and to talk to people during her exhibition in

order to educate them about the issue. She complains that most people don't understand the issue and think that she is crazy.

The Secondary Integration

In her development, Anne is approaching the highest level, *the secondary integration*, which is characterized by a new organization of mental structure, and the harmonization of personality. She is open to a wide range of experiences and is deeply interested in science as well as social and environmental issues. Her interests extend from women's issues to environmental issues relevant to all people. By understanding the role of interdependence and interconnection with the natural world, Anne's self emerges to the ecological self (Spitzform, 2000).

Her creativity coupling with empathy and responsibility for herself and others help her develop an autonomous personality (Dabrowski, 1967, 1996). This level of development is comparable to Kohlberg's post-conventional level (stage 6), characterized by mutual respect as a universal ethical principle (Kohlberg, 1969). It is also comparable to Kegan's fourth order of consciousness (self-authorizing), characterized by self-regulation, self-formation, identity, autonomy, and individuation (Kegan, 1994).



CHAPTER NINE:

DISCUSSION OF FINDINGS, IMPLICATIONS AND INSIGHTS

Summary of research problem and questions

The research problem that motivated this study was: *what is the role of creativity during the period of adolescence and during the transition from adolescence to young adulthood?*

The research questions, which stemmed from the problem and directed this study, were grouped into six focal areas: cognitive awareness, emotional access, interpersonal skills, moral capacity, spiritual experience and self-identity.

Cognitive awareness:

What role does creativity play in the cognitive development of adolescents?

What roles do motivation, interest, attention, concentration, and openness play in the process of creativity?

Emotional access:

What role does creativity play in the emotional development of adolescents?

How does creativity help adolescents deal with their negative emotions?

How does creativity contribute to an increase in the experience of positive emotions?

Interpersonal skills:

What role does creativity play in the development of adolescents' interpersonal skills? How does creativity influence the changes in relationships between adolescents and their family and peers?

Moral capacity:

Does creativity have any role in the moral capacity of adolescents?

Spiritual experience:

What role does creativity play in the spiritual development of adolescents?

Self-identity:

What role does creativity play in the self-identity formation of adolescents?

Findings: The Meaning of Creativity and Its Role in Development

The following are the themes that arose from the analyses of the seven participants' stories in response to the research questions:

1. Creativity helps adolescents in the turbulent period of adolescence by serving as an outlet for their increased tensions and their inner and external conflicts.
2. Creativity promotes conditions that are optimal for the prevention of serious mental disorder.
3. Creativity helps young people in the process of cognitive, emotional, and spiritual development.
4. Creativity helps adolescents in the process of identity formation and in finding direction toward their future goals and plans.

In this section, I review the meaning of creativity, as defined by each participant, and its role in their development.

Stephannie

“If I hadn’t been an artist...I would never have figured out who I am.”

During her childhood and her early adolescence, Stephannie’s creativity was a refuge, a retreat, and a method of survival from an unfriendly and brutal external environment (themes 1 & 2).

During her young adulthood, Stephannie grew as a creative person, and her artistic practice helped her to understand herself and her obsessions, and to learn how to deal with them. Her interest in art developed into a profession. (themes 3 & 4).

Krista

“I feel that it is something that I love doing, that I am passionate about and that I am able to share with others.”

Her passion for circus arts helped her to overcome her very difficult period after a serious injury. She became a resourceful person, learning how to cope with her injury and how to train smarter (themes 1 & 2).

Krista creates her performance pieces by herself, which gives her the chance to develop: 1) intellectually, by creating the concept of the piece; 2) emotionally, by allowing the piece to express various emotions; and 3) spiritually, by connecting to and sharing with the audience (theme 3).

By deciding to study at the National Circus School, Krista has completely committed herself to her passion, and is focused on her future profession (theme 4).

Eton

“If I don’t enjoy the process and it is leading me into the ego direction, I don’t want to do it. I only want to be closer to my being, to my soul.”

Eton’s sensitivity to the human condition helped him to make the life-changing decision to follow his passion, to become an artist and to be entirely committed to his studies (theme 4).

As a result of his artistic practice, Eton became deeply interested in spirituality, meditation, and breathing exercises, which quiet his mind and prepare him for his artistic pursuits. He also challenges himself by studying and experimenting with the techniques of old masters (theme 3).

Marsha

“It happens in my writing and in my art too. Sometimes, I feel like I am connected to some form of energy...I just feel like a stream going through everything...It just vibrates.”

During her middle adolescence, Marsha was deeply interested in art; drawing was the best stress relief for her (theme 1).

Now in her late adolescence, Marsha is fascinated with the spiritual problem of the mind-body connection and realizes that creating art is the only way to link both. She is also discovering a new way of expressing herself through writing by deeply immersing herself in the internal state and allowing her writing to emerge spontaneously (themes 4 & 3).

Jade

“I don’t think that I can live without it. It is so essential to everything.”

Jade describes herself as lucky and blessed that she found her passion for art very early in life and was encouraged by her parents. Her father and her high school art teacher greatly influenced her to become involved in artistic activity, and subsequently her love for art helped her through a difficult period of adolescence (theme 1).

Art has become the essential part of her life, as she actively works as an artist and as an art teacher (themes 3 & 4).

Alasdair

“It is one of the best feelings that I know. It is of knowing that this is something I created....This is just me.”

During his late adolescence, Alasdair opened himself to different areas of science and art, combining aspects of them to create interesting school projects (theme 1). Since graduating high school, he has started studying many subjects such as mathematics, music, physics, and languages, but he has yet to discover his main interest (theme 3).

Anne

“Survive... Somehow I knew that there was something unique that I had to do. I didn’t know what it was....It just gave my life meaning. I don’t know if I would have survived if I had not found this vocation.”

Anne’s artistic practice helped her to survive and grow in response to the challenging conditions of South America (theme 1).

Her depression and her hypoglycemic symptoms disappeared when she became involved in artistic activities (theme 2).

Anne’s creative dynamisms, coupled with empathy, have expanded her interest from women’s issues to the life conditions of all people and the ecological problems of the natural world. They have helped her develop an autonomous personality (themes 3 & 4).

Studying the lives of these seven creative people, I can say without any hesitation that creativity played and continues to play a significant role in their lives and their emotional, cognitive, and spiritual development. In their adolescence, creativity helped them survive the turbulent period of internal and external conflicts by allowing them to learn about themselves,

and by connecting them to something meaningful for them. Thus, creativity has helped them in the transition from adolescence to young adulthood by reorganizing their mental structures, bringing more stability and order to their lives.

Creative Lives as Meaningful Lives

The creative lives of the participants have become meaningful lives satisfying the desires for purpose, value, and a sense of efficacy (Baumeister, 1991; Baumeister & Vohs, 2005).

The Needs for Purpose

The essence of *purpose* is that present activities draw meaning from their connection to future events.

For example, Krista's work on her performance piece takes its meaning from its transformation from a mere idea to a future performance. It motivates her toward really diligent and persistent work. Stephannie's scuba-diving experiences draw meaning from their connection to her paintings of underwater themes she later creates. The purpose of Marsha's deep observation of her internal state takes its meaning from its connection to her creative writing, she allows herself to be bounded to the creative process. Anne's great interest in women's issues and ecological problems is expressed by her paintings, sculptures, and installations. Her creative practice gives her life meaning, since through her practice she is able to make others more aware of these issues.

The Needs for Values

A meaningful life also calls for a *need for values*, which enable people to decide whether certain actions are right or wrong. This need for values is important in psychological development. For example, Eton expressed his need for values by saying:

If I don't enjoy the process and it is leading me into the ego direction, I don't want to do it. I only want to be closer to my being, to my soul. My girlfriend and I, we want to do only what we call good for goodness sake, what is right to do. Through my painting and her writing, we want to develop these virtues: patience and understanding, forbearance and being in the present moment and being the wind of change in this world. If a hundred people change, it is good. If ten change, it is good. If one person changes, it is just as good.

The Needs for a Sense of Efficacy

In Eton's statement, it is easy to recognize the final important factor of a meaningful life: the need for a *sense of efficacy*. Self-efficacy theory emphasizes the importance of "people's beliefs in their capabilities to produce desired effects by their own actions" (Bandura, 1997, p. vii). This is the belief that one can make a difference, that one has the ability to coordinate her skills and abilities in order to attain her desired goals in particular domains and circumstance. Self-efficacy beliefs develop over time through experiences of self-observation, self-evaluation, reciprocal interactions with other people, and self-regulation. At the heart of self-regulation is the ability to anticipate or develop expectancies—to use one's past knowledge and experience to form beliefs about future events and states about one's abilities and behavior (Maddux, 2005, p. 279). The idea that people are self-organizing, proactive, and self-reflecting entities is fundamental to Dabrowski's theory of positive disintegration.

For example, Krista expressed her need for efficacy in this way:

I do hope that one person—one is enough—will be inspired in some way in their own life, that it [Krista's performance] triggers some reflection, some thoughts. Even if it is just one person, I will be pleased.

Anne is concerned with environmental issues:

When you destroy the plankton, what happens to oxygen? How long will we survive? It is a really critical issue. I am really concerned for the whole dilemma of the planet...I will get around with an exhibition of my work and actually talk to people about it.

Thus, a creative life can be understood as a meaningful life where the process of creativity makes connections across time by introducing purpose and values and empowers one to make life choices that often bring joy, satisfaction and fulfillment. In young adulthood, creativity helps one grow into a resourceful, optimistic, sanguine, confident, and prideful human being. One becomes open and receptive, not only to human issues, but often to the wider problems of the natural world as the ecological self develops.



Implications for Theory and Practice: Pattern Models of Creativity

One outcome of this research was the creation of *pattern models of the process of creativity*. To generate these models, I applied the idea of self-organization, which is particularly useful for modeling the coming-into-existence of new forms, patterns or structures.

There are some unique differences between the models of different participants' creativity, but in general they share common phases such as differentiation/chaos, integration/complexity, creativity/dissipative structures (products of creativity in the forms of new movements, new writings, new paintings, new compositions), and finally psychological changes in the individual self.

In this section I discuss two modes of mental processing that are observed during the process of creativity: the mindful mode (differentiation) and the default network mode (integration).



1. Creative, Heaven over Heaven

Spiritual power originates from heaven.

It is active within us, initiates our action,

gives our life meaning, direction, and creativity.

The Mindful Mode

As I have shown above, creativity is the magic process which enables people to move to higher levels of psychological development. This mental growth would not be possible without disquietude, restlessness, or even nervousness. Kazimierz Dabrowski emphasizes in his writing that creativity demands “turbulence” in the inner environment. Similarly, Ilya Prigogine reminds us that creativity must be connected in some way to the distance from equilibrium, and is thus the result of an irreversible process. This is a state of differentiation, a state of increasing entropy, a state of uncertainty and expectancy. During this phase of the creative process, individuals are actively observing, planning, making decisions, resolving conflicts, correcting responses, struggling to retrieve memories, and linking ideas that previously seemed unrelated. They experience a wide variety of emotions in this phase, such as interest, fascination, inspiration, joy, delight, acceptance, surprise and curiosity. Thus, instead of seeing they are observing, instead of hearing they are listening, instead of feeling they are touching.

Individuals in this phase become “open” and “receptive” to their external and internal environments. They become active participants and sensitive observers of the ongoing processes of experience.

For example, Krista might find herself particularly sensitive to a little spark such as a piece of music or a few words or some kind of visual stimulus, and this spark might inspire her during the process of creating her performance pieces. Marsha, before starting her writing, is completely open to her internal state and the energy going through her body. Stephannie is a sensitive observer of the underwater environment and she later brings to her mind images and feelings

from her underwater experiences. Anne is sensitive to women's issues and creates paintings and sculptures expressing women's experiences. She is also very concerned with the destruction of plankton, which produces half of the world's oxygen, and plans to use her art to increase awareness of this issue.

Neuroscience of the Mindful Mode

This mental state requires a high degree of attention in order for one to select or differentially amplify certain conscious experiences (Edelman & Tononi, 2000; Edelman, 2004). It is called the mindful mode of cognitive processing, and it is a form of experience that promotes neural plasticity (Siegel, 2007).

Siegel (2007) writes: "When we focus our attention in specific ways, we are activating the brain's circuitry. This activation can strengthen the synaptic linkages in those areas" (p.31). Those areas are the middle regions of the prefrontal cortex, including the orbitofrontal, anterior cingulate, and ventral and medial prefrontal cortex.

In chapter 6, "The Adolescent Brain Development," I discussed how during middle adolescence the middle regions of the prefrontal cortex, especially the anterior cingulate (ACC) and the orbitofrontal (OFC) cortices, begin to develop.

These midline ventral and medial structures receive direct input from the entire brain and body, especially with contribution from the insula cortex (IC). The insula cortex bridges and coordinates limbic (amygdala, hippocampus, hypothalamus), body (by way of the brainstem and spinal cord) and cortical processing. Then, the middle prefrontal region links the body, brainstem, limbic, cortical, and social processes into one functional whole (Figure 74).

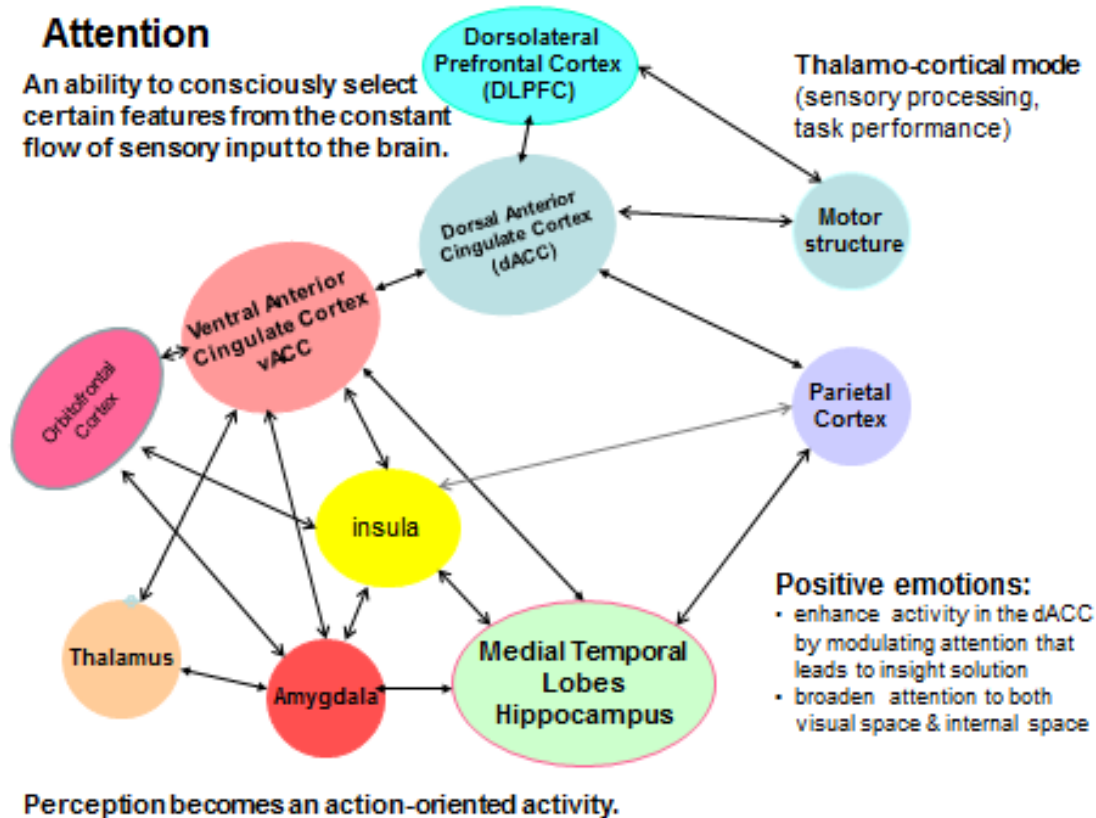


Figure 74 Neural connections during the mindful mode

The integration of the orbitofrontal, medial and ventral prefrontal, and anterior cingulate cortices, combined with the input of the insula cortex, reveals an executive circuit whose functions span from bodily regulation to aspects of social understanding, such as *response flexibility*, *insight* (self-knowing awareness), *intuition*, and *empathy*.

As I showed in chapter 6, these functions start developing through middle and later adolescence, and young adulthood.

Response flexibility is the capacity to pause before action. Such a process requires the assessment of ongoing stimuli, the delay of reaction, the selection from a variety of possible options, and the initiation of action (Siegel, 2007, Fellow, 2004). Response flexibility is needed

during planning, decision making, and creative processes. It is also needed for the resolving of conflicts and the correction of responses.

Insight, or self-knowing awareness, links the past, present, and future (Beer et al., 2006; Frith & Frith, 1999).

Intuition seems to involve the registration of input from the information-processing neural network surrounding our heart, lungs, and intestines. This input registers itself in the middle prefrontal cortex and then influences our reasoning and our reactions (Damasio, 1994, 1999; Liberman, 2000).

Empathy is a complex phenomenon emerging from the flow and integration of information between specific circuits of the brain. This was discussed in chapter 6 in the section on the Brain of Late Adolescents and Young Adults.



2. Receptive, Earth over Earth

The strength of the Earth lies in

quietness, firmness, and perseverance.

It symbolizes the unconscious, working

during quiet periods and during sleep.

The Default Network Mode

The human brain needs time to do “something” with all of its emotions, thoughts, images, and memories. The study participants are aware of this special phase of their creativity.

For example, Marsha needs a short nap before her writing. Eton needs a breathing exercise or meditation before starting to paint. Alasdair and Anne spend a lot of time daydreaming.

This period depends on many things: on the challenge of the project, on one’s emotional connection to the project, on the level of preparation for the project, on the emotional or intellectual state of the individual, and many others. From a complexity science perspective, this is a period when all mental components combine with each other and create complex mental structures that depend on the internal relationships between these components. From a neuroscience perspective, this is the *default mode of the human brain* as proposed by Raichle et al. (2001).

Neuroscience of the Default Mode

Raichle et al. (2001) discovered high levels of activity in certain parts of the brain during passive “rest” periods when individuals were not focused on the external but rather on their internal environment. These are midline areas within the posterior cingulate and precuneus and within the medial prefrontal cortex (MPFC). The posterior cingulate cortex and adjacent precuneus are responsible for gathering information about the world around, and within us. The MPFC plays a

role in the integration of emotional and cognitive processes by incorporating emotional biasing signals or markers into the decision-making process (Bechara et al., 2000). The ventral MPFC receives a wide range of sensory information from the body and the external environment and are heavily interconnected with components of the limbic structure such as the amygdala, hypothalamus, and brainstem (Gusnard et al., 2001). Buckner et al. (2008) proposed that the brain's default network can be understood as multiple interacting subsystems. *The medial temporal lobe* (MTL) subsystem provides information from prior experiences in the form of memories and associations, which are the building blocks of mental simulation in the form of novel ideas. *The medial prefrontal subsystem* facilitates the flexible use of information during the construction of self-relevant mental simulations. These two subsystems converge on important nodes of integration including *the posterior cingulate cortex*. Schilbach et al. (2008) stressed that the mode of default network functioning can help to integrate self-referential information, facilitate perception and cognition and provide a social context or narrative in which events become personally meaningful (Figure 75).

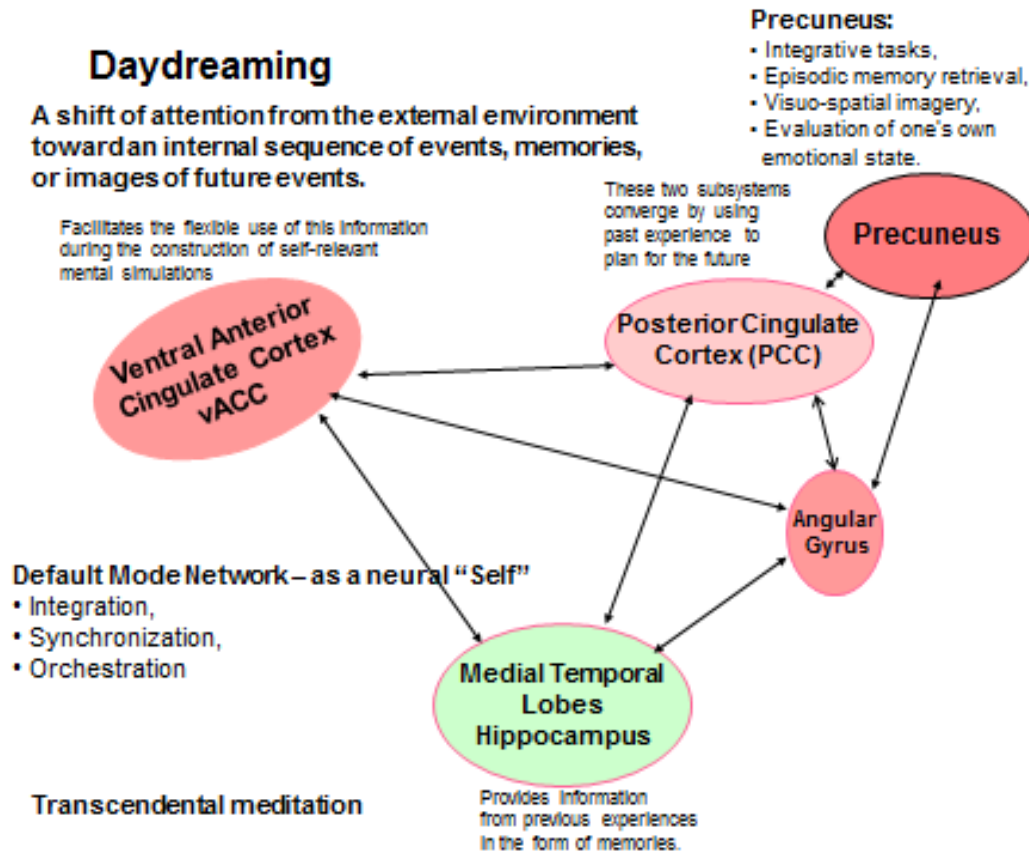


Figure 75 Neural connections during the default network mode

Because the default network mode is a fundamental network concerning self-referential mental activity and social cognition, it is important to understand how the structural connectivity associated with this network matures with age. Supekar et al. (2010) found that the default network mode undergoes significant developmental changes in functional and structural connectivity between childhood and adulthood. In young adults, functional connectivity was significantly correlated with structural connectivity. Children showed a weak correlation between functional and structural connectivity. This suggests that function-structure relationships between the posterior cingulate cortex (PCC) and the medial prefrontal cortex (MPFC) parts of the DMN become more stable with development, and depend on the process of myelination.

Based on these findings, they hypothesize that the maturation of the default network mode, and in particular the maturation of structural and functional connectivity between the PCC and the MPFC, plays an important role in the development of the self and the social-cognitive functions that emerge during adolescence.

Recent studies have found that in addition to default network activation, mind-wandering or daydreaming is associated with the executive network (Christoff et al., 2009). The executive brain region, the dorsal anterior cingulate cortex (dACC) and the dorsolateral prefrontal cortex (DLPFC) become activated when an individual engages in demanding mental activity. Co-activation of the executive and default networks is also observed during creative thinking and before solving problems with insight (Kounios & Jung-Beeman, 2009). This is a unique brain state that allows bringing together ideas, images, and memories (Figure 76).

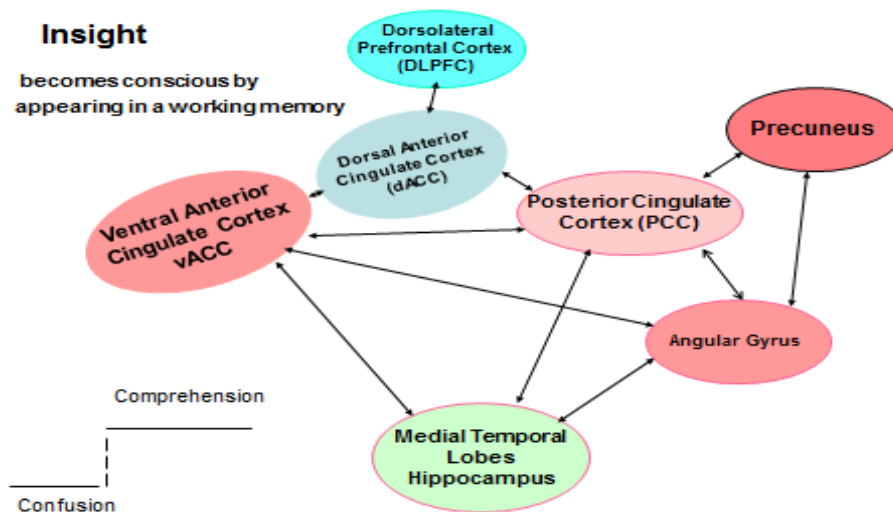


Figure 76 Neural connections of the default network and the executive network mode.

**Insights: Impact of Creativity
on the Individual and on Others**



63. Completion, Water over Fire

*This hexagram represents a condition
of successful accomplishment and
transition from the chaos to order.*

*It expresses the balanced interaction of
two opposing elements; fire and water.*

*However, harmony and balance are always fragile
and demand extreme attention.*

Impact of Creativity on the Individual

These two modes of mental processing—the mindful mode and the default mode—are essential for creative thinking. They are like day and night, lightness and darkness, fire and water. During the process of creativity, individuals are alternately active and passive; they engage, but then they need a rest. They are oscillating constantly between these two modes, pushing themselves into a state of complexity, into the edge of chaos, into “perpetual novelty”, into the immense space of possibilities (Waldrop, 1992). Creative people are able to generate something new, something unique, something special. The process of creation is intertwined with strong emotions of passion, curiosity, enthusiasm, and delight, which stimulate their thinking. Their thinking then deepens their emotions, which, through a process of reciprocal reinforcement, influences their selves. Creative people become more sensitive, more open and receptive to the internal and external world. They develop into resourceful, sanguine, confident, empathetic, and spiritual human beings.

Impact of Creative Products on Others

Creative products such as performance pieces, paintings, writing, compositions, or even school projects, can be made available to others at the cultural and social levels. People can be “infected” by these creative products. They can be inspired. These products can change their thinking and feeling, leading them to experience a variety of emotions such as joy, interest, curiosity and pleasure. It is difficult to predict how much and what will resonate with others. I can only express my own experiences from talking to creative people and seeing their work.

Each and every person I met for this project was an enormous discovery for me, and talking with them was an eye-opening experience. All of them have influenced me immensely.

For example: Krista taught me about the beauty and richness of circus art and contortion. I later went to see the Cirque du Soleil production “OVO” and had a great aesthetic experience. Eton influenced me on a spiritual level by sharing with me his artistic practice as a moving meditation, and teaching me the importance of breathing exercises. In his presence, I felt totally peaceful and relaxed. I realized also that his artworks evoke in me emotions of delight, surprise, and even curiosity. I caught myself going back to Eton’s art pieces and enjoying them again and again. They attract me with some kind of mystical strength. Stephannie’s interest in scuba diving and her beautiful paintings expressing the underwater environment arouse in me a curiosity for this world. Her artworks influenced me to choose Belize (a great place for scuba-diving) as the location for our winter vacation. Marsha moved me deeply with her spiritual and poetic writing and her connection to and empathy for the suffering of Mother Nature. Jade’s flower compositions touched my aesthetic sensitivity and induced feelings of joy and serenity. And finally, Anne, through her paintings and installations, increased my awareness regarding women’s issues and environmental concerns.

Final Insight:

Contribution to the Understanding of the Complexity of Adolescent Development

This dissertation is intended for educators, parents, and others who are interested in the psychological development of young people. It is the first attempt to link the theory of positive disintegration with complexity theory, neuroscience, and theories of emotions. It appears important to bring together the insights from these areas of study in order to achieve a more integral understanding of the complex process of the emotional development of adolescents. I have demonstrated that the unilevel and the spontaneous multilevel disintegration are outcomes

of dynamic and dramatic changes in the adolescent brain. These phases are normal and crucial periods of adolescent development. They represent a far-from-equilibrium state that is a necessary condition for the self-organization of young persons' mental structures into more complex and ordered states. Throughout this process, young people become active agents in their own development; they become responsible for their lives, able to channel their tension "upward" through creativity and other developmental dynamisms of the higher levels.

During adolescence, the brain's medial prefrontal and the limbic cortices are highly sensitive to environmental input. Creative processes, positive experiences, and the formation of memories play a major role in building up new neuronal connections between the emotional and cognitive systems. These processes lead to the integration and stabilization of emotional-cognitive structures that have an enormous advantage in confronting complex situations.

Positive emotions such as interest, joy, acceptance, curiosity, enthusiasm, delight, passion, resourcefulness, and love enhance mental activity to global, open and exploratory modes of attention. Freeman (2000a, 2000b) proposes that emotions are essential to all intentional behaviors. They are a "stretching forth" of intentionality.

Contrary and intense negative emotional states such as anxiety and depression decrease mental activity, making individuals' responses more rapid and automatic.

The main finding and insight of this study was that psychological development through the dynamisms of positive disintegration, especially through creativity, appears to provide the best protection from and prophylaxis against mental "disorder" in adolescents. Through the creative process, adolescents gain the capacity to differentiate and then to integrate their own distinct inner experiences in order to achieve internal dynamic order and find direction in their future goals and plans.

CONCLUSIONS

1) It is always challenging to bring together ideas from disparate fields of study without appearing to be arbitrary. In this regard, Wilber's Integral Model (a particular expression of integral theory) was a useful conceptual framework for integrating a variety of disciplines and theories into a meaningful map, showing their origins and their relationships with each other. Through the integration of the theory of positive disintegration with theories of emotions and the concepts of complexity science, the unique patterns of developmental processes of seven participants have emerged.

2) Methodology: Ontology/Hermeneutic Phenomenology

Following Heidegger and Gadamer's idea, the researcher immersed herself in the circular movement of understanding and interpreting the psychological development and creativity of young people. This was a multistage and very productive process of finding new meanings generated through "deep" interviews, the journals of the participants, and their art products. The researcher's experiences as an artist, scientist, and educator played an essential role during this process. Her openness, sensitivity, and understanding of art and the process of creativity helped her to connect with participants on a deeper level and gain their honesty and trust.

3) Young people willing to share their life experiences and creativity for this study were a small percentage of people approached by the researcher. Surprisingly, these young people were very open and willing to talk on a deep level, sharing their feelings, thoughts, memories, beliefs, decisions, spiritual convictions and ideas about their creative processes. From the interviews with them, the researcher has learned that during their early and middle adolescence they experienced internal conflicts, anxieties and, very often, depression.

Fortunately, these young people had somebody (a parent, teacher, or friend) who accepted them and helped them to bifurcate to the higher psychological levels.

- 4) As was mentioned above, creative adolescents display symptoms of increased psychic excitability, nervousness, and psychoneuroses such as anxiety and depression. Parents and educators need to know these signs and should create conditions such that young people will suffer less from unnecessary tension operating on lower levels. Such conditions activate the process of development to more complex, richer, and higher levels characterized by lesser tension. This study demonstrated that what is most important, is to create a condition of acceptance. In this context 'acceptance' goes well beyond any form of politically correct tolerance. Acceptance (taking in) is a strong positive emotion that involves one's sense of identity. Acceptance helps young individuals connect with the outside world. Their pattern of behavior, thoughts, and feelings change and become healthier. Young people are then able to open themselves to their interests and to other people. They become more imaginative, especially in difficult situations, and more friendly by accepting others. They begin to experience new emotions such as joy, friendliness, surprise, resourcefulness, curiosity, and delight. Activated emotions act as a flow of energy which becomes the driving force for their creativity and psychological development. Acceptance in this sense may be quite challenging for teachers to practice, particularly in schools with highly normative approaches to student conduct.
- 5) It was shown that during the process of creativity on the higher levels, young people experience complex emotions such as attraction (a combination of joy, surprise, and acceptance), enjoyment of the unexpected (a combination of anticipation, surprise, and joy), open-mindedness (a combination of anticipation, surprise, and acceptance), and sanguinity (a combination of anticipation, joy, and acceptance). Multiple occurrences of complex emotions or emotion-cognitive sequences may lead to the stabilization and formation of self-identity or traits of personality of young people. Creative people become resourceful, open-

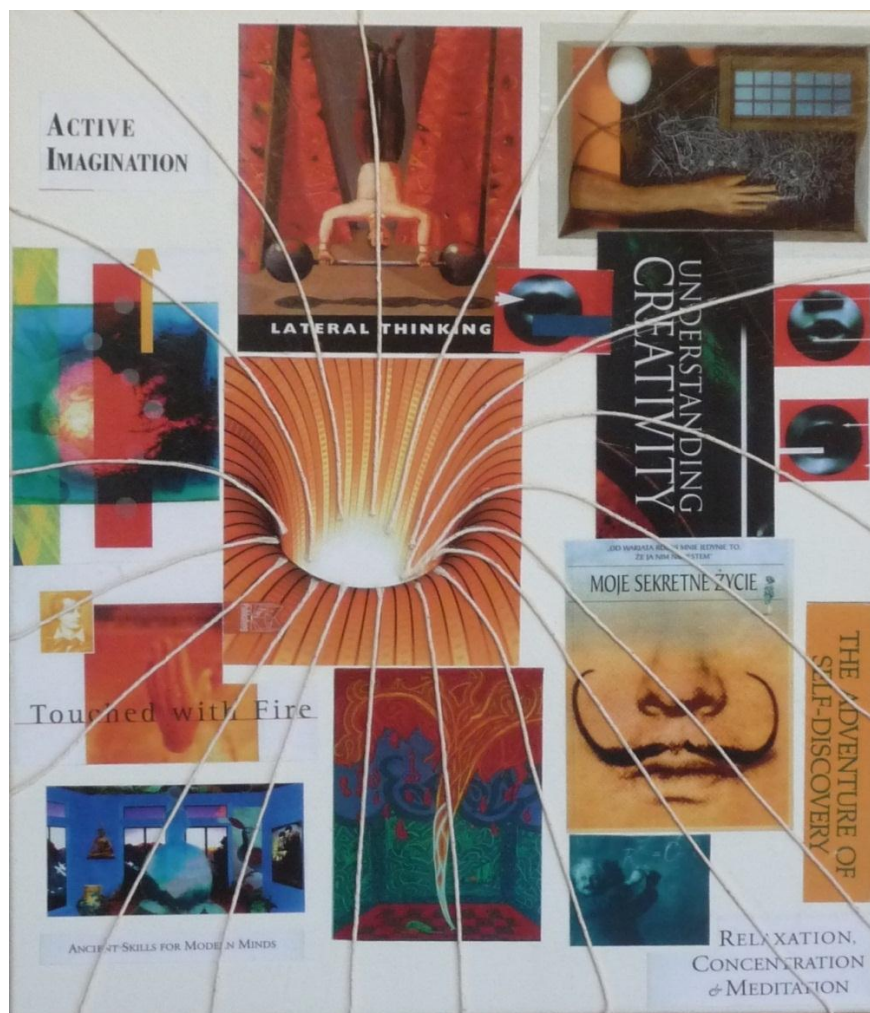
minded, sanguine, and optimistic individuals. Their positive experiences during adolescence stimulate the healthy development of brain and body, great social skills, highly developed cognitive abilities, and emotional and spiritual development.

- 6) In this dissertation, two articles of the researcher's were included. Both articles—"Positive Maladjustment as a Transition from Chaos to Order" and "Theory of Positive Disintegration as a Model of Adolescent Development"—involve the reconceptualization of the theory of positive disintegration by applying complexity science: chaos theory and the theory of self-organization. The researcher hopes to fulfil Kazimierz Dabrowski's wish to keep his theory "alive" and to include "in the future more complete, wider theories as well as the subject matter of creative work of individuals better prepared for this task" (Dabrowski et al., 1970, p.XI).

In accordance with Dabrowski's theory, the researcher demonstrated that the crucial period for creative adolescents' development is the spontaneous multilevel disintegration (chaotic attractor). It represents a far-from-equilibrium state that is a necessary condition for self-organization to more complex and ordered states of mental structure in young people. Through this process, they become active agents in their growth, responsible for their own lives, and able to channel their tensions "upward" through developmental dynamisms of higher levels.

- 7) This study shows why it is of enormous importance to encourage creativity in schools:
 - a) For early and middle adolescents, creativity becomes very often a refuge, a retreat, and a way of escaping an unfriendly or brutal environment.
 - b) Creativity allows them to learn about themselves, connect them to something meaningful, and introduces purposes and values in their lives.
 - c) Creativity helps them in emotional, cognitive, and spiritual growth and empowers them to make life choices that bring joy, satisfaction, and fulfilment.

- d) Creativity helps them grow into resourceful, optimistic, sanguine, open-minded, confident, and prideful human beings.
 - e) Creativity helps them to become open and sensitive not only to human issues and to other human beings, but often to wider problems of the natural world.
- 8) The researcher is aware of and recognizes the subtleties and intensity of emotions and plans to include them in future research on psychological development and creativity.
- 9) The researcher's main contribution to research on creativity and psychological development of young people is demonstrating that *both* are self-organizing processes emerging spontaneously purely as a function of the inner dynamics of interactions between the system's components in a far-from-equilibrium state. Creativity is a self-organizing process that originates in a far-from-equilibrium state created and maintained by complex emotions (such as delight, curiosity, enthusiasm, love, passion, and resourcefulness) which are the driving forces generating order and complexity in the creativity of young people. Similarly, the psychological development of creative adolescents is a self-organizing process, which implies the increasing complexity of the mental structure that differentiates –incorporates more and more elements from mental life, especially emotions, thoughts, imagination, and memories and then integrates – constructs connections between these elements. The long-term process of psychological development and the short-term process of creativity are intertwined in the cyclical, dynamical relationship. Creativity as a temporary or momentary experience / action creates the conditions in which emotional, cognitive and spiritual development take place. Psychological development, on the other hand, creates the conditions for creativity to emerge by adjusting the internal environment toward openness, sensitivity, and receptivity.



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Invitation for Research Participation

Are you a high school, college or university student who wants to share a story about your creativity?

You are invited to participate in
a doctoral dissertation project:
**“The Development of Creativity: A Study of Creative
Adolescents and Young Adults.”**

This research involves two interviews (each approximately two hours long) and a follow-up session (30minutes) that will take place in the location where you create your artwork.

By participating you will be helping in the understanding the role of creativity during the turbulent period of adolescence and the transition from adolescence to young adulthood.

If you are interested or want more information,
please contact **Krystyna Laycraft** at
krystyna@platinum.ca

Appendix B: Participant Information Sheet



Participant Information Sheet

You are invited to participate in a doctoral dissertation project:

“The Development of Creativity: A Study of Creative Adolescents and Young Adults.”

The research involves two interviews (approximately two hours each) and a follow-up session (30minutes) that will take place in the location where you create your artwork.

You will be assisting in efforts to understand the role of creativity during the turbulent period of adolescence and the transition from adolescence to young adulthood.

Pseudonym: _____

Current status: ☐ High School Student
☐ College Student
☐ University Student

Highest Educational Level: _____

Age: _____

Interest: _____

Art Activities: _____

Appendix C: Consent form for Interview of Younger Adolescents and Parents



Consent form for Interview of Younger Adolescents and Parents

Name of Researcher, Department, telephone & Email

Graduate Student: **Krystyna C. Laycraft, M.Sc.**

Graduate Division of Education Research, University of Calgary

403-646-2576 krystyna@platinum.ca

Supervisor: **Dr. Veronika Bohac Clarke**

Graduate Division of Educational research, University of Calgary

403-220-3363 bohac@ucalgary.ca

Dear Students:

Please read this form with your parent or guardian. Make sure you understand the information in this document. If you are interested in the project described here, please discuss it with your parent or guardian.

Title of Project:

The Development of Creativity: A Study of Creative Adolescents and Young Adults

The University of Calgary Conjoint Faculties Research Ethics Board has approved this research study.

Purpose of the Study:

The purpose of this study is to investigate creativity of young people and its role as a component of their psychological development. Specifically, the aim of the research is to investigate the role of creativity as a possible natural protective and prophylactic outlet for addressing mental “disorders” of adolescents.

What Will I Be Asked To Do?

You will be asked to participate in two interviews with the researcher about your creative experience. These interviews (approximately) two hours each will take place in your place (studio, home, school, etc.). These interviews will be individual in nature and conducted in person. During the second interview session you will be required to read, review, and edit the biographical narrative written about you as means of checking the accuracy of the researcher’s understanding of your story/biography.

Within 90 days of the closing of this study, you will be asked to attend a 30 minutes follow-up session. The follow-up serves four functions: to ensure ethical guidelines have been met, to discuss any educational benefits, to review the methodological process for potential revisions, and to encourage a sense of satisfaction in contributing to educational research and society.

Your participation is voluntary, you may refuse to participate altogether, refuse to answer a specific question, or you may withdraw from the study at any time.

What Type of Personal Information Will Be Collected?

No personal identifying information will be asked. You shall remain anonymous. You will be given a pseudonym (different name) by the researcher, to ensure that your identity can not be discovered by those who know you. This use of new name will be indicated in the dissertation. If you feel that the pseudonym chosen for you could accidentally identify you, please inform the researcher and another name will be chosen.

You will be asked to provide general information such as your age, school, interest, etc. by completing a “Participation Information Sheet”.

After these general questions, you will be asked in details about your process of creativity and other mental activities connected with this phenomenon.

Your answers need to be recorded so that they can be transcribed later and so the researcher can focus on what you are saying, rather than writing it down.

You may be asked for the examples of your creation like poems, pieces of writing, photographs of your artwork, or diary entrances. There will be the possibility of collecting them or just photographing them, and storing the images on a CD. All such articles will be returned to you at the completion of dissertation.

There are several for you to consider if you decide to take part in this research. You can choose all or some of them. Please put a check mark on the corresponding lines that grants me your permission to:

Are there Risks or Benefits if I Participates?

You will be asking questions which address negative emotions and there would appear to be at least some possibility that you may experience distress during the interview session(s). You will be informed about the availability of counselling services.

Participation in the study may increase awareness of the role of creativity in the psychological development.

What Happens to the Information I Provide?

Participation in the interview is completely voluntary, anonymous and confidential. You are free to stop at any time. If you decide to withdraw from this study at any time during the interview, simply tell the researcher who is interviewing you. The interview will be stop immediately, and your answer will not be used in the study.

No one except the researcher and her supervisor will be allowed to see (or hear) any of your answers. There are no names on the tapes or transcriptions, except for the pseudonym chosen for the participants. The tapes and transcripts are kept in a locked cabinet only accessible by the researcher. Three years after the researcher's dissertation is approved by her research committee, the participants' recording, transcripts, and all computer data files associated with this study will be destroyed. The researcher will use the data in dissertation and in publication of articles on the process of creativity. Any publications that result will never identify your personally.

Signature (written consent)

Your signature on this form indicates that you 1) understand to your satisfaction the information provided to you about your participation in this research project, and 2) agree to participate as a research subject.

In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from this research project at any time. You should feel free to ask about anything that is not clear or for new information throughout your participation.

I agree to let my child _____ participate in this study.

Parent/Guardian's Name: (please print): _____

Parent/Guardian's Signature: _____

I grant permission to be audio taped: Yes:___ No:___

I wish to remain anonymous, but you may refer to me by a pseudonym: Yes:___ No:___

The pseudonym I choose for myself is: _____

Participant's Name: (please print) _____

Participant's Signature _____ Date: _____

Researcher's Name: (please print) _____KrystynaLaycraft_____

Researcher's Signature: _____ Date: _____

Questions/Concerns

If you have any further questions or want clarification regarding this research and / or your participation please contact:

Krystyna Laycraft, M.Sc.
Faculty of Education, University of Calgary
krystyna@platinum.ca

If you have any concern about the way you've been treated as a participant, please contact the Senior Ethics Resource Officer, Research Services Office, University of Calgary at (403) 220-3782; email rburrows@ucalgary.ca

A copy of this consent form has been given to you to keep for your records and reference. The investigator has kept a copy of the consent form.

Appendix D: Consent form for Interview of Participants



Consent form for Interview

Name of Researcher, Department, telephone & Email

Graduate Student: **Krystyna C. Laycraft, M.Sc.**

Graduate Division of Education Research, University of Calgary

403-646-2576 krystyna@platinum.ca

Supervisor: Dr. Veronika Bohac Clarke

Graduate Division of Educational research, University of Calgary

403-220-3363 bohac@ucalgary.ca

Title of Project:

The Development of Creativity: A Study of Creative Adolescents and Young Adults

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What Will I Be Asked To Do?

You will be asked to participate in two interviews with the researcher about your creative experience. These interviews (approximately) two hours each will take place in your place (studio, home, school, etc.). These interviews will be individual in nature and conducted in person. During the second interview session you will be required to read, review, and edit the biographical narrative written about you as means of checking the accuracy of the researcher's understanding of your story/biography.

Within 90 days of the closing of this study, you will be asked to attend a 30 minutes follow-up session. The follow-up serves four functions: to ensure ethical guidelines have been met, to discuss any educational benefits, to review the methodological process for potential revisions, and to encourage a sense of satisfaction in contributing to educational research and society.

Your participation is voluntary, you may refuse to participate altogether, refuse to answer a specific question, or you may withdraw from the study at any time.

What Type of Personal Information Will Be Collected?

No personal identifying information will be asked. You shall remain anonymous. You will be given a pseudonym (different name) by the researcher, to ensure that your identity can not be discovered by those who know you. This use of new name will be indicated in the dissertation. If you feel that the pseudonym chosen for you could accidentally identify you, please inform the researcher and another name will be chosen.

You will be asked to provide general information such as your age, school, interest, etc. by completing a "Participation Information Sheet".

After these general questions, you will be asked in details about your process of creativity and other mental activities connected with this phenomenon.

Your answers need to be recorded so that they can be transcribed later and so the researcher can focus on what you are saying, rather than writing it down.

You may be asked for the examples of your creation like poems, pieces of writing, photographs of your artwork, or diary entrances. There will be the possibility of collecting them or just photographing them, and storing the images on a CD. All such articles will be returned to you at the completion of dissertation.

Are there Risks or Benefits if I Participates?

You will be asking questions which address negative emotions and there would appear to be at least some possibility that you may experience distress during the interview session(s). You will be informed about the availability of counselling services.

Participation in the study may increase awareness of the role of creativity in the psychological development.

What Happens to the Information I Provide?

Participation in the interview is completely voluntary, anonymous and confidential. You are free to stop at any time. If you decide to withdraw from this study at any time during the interview, simply tell the researcher who is interviewing you. The interview will be stop immediately, and your answer will not be used in the study.

No one except the researcher and her supervisor will be allowed to see (or hear) any of your answers. There are no names on the tapes or transcriptions, except for the pseudonym chosen for the participants. The tapes and transcripts are kept in a locked cabinet only accessible by the researcher. Three years after the researcher's dissertation is approved by her research committee, the participants' recording, transcripts, and all computer data files associated with this study will be destroyed. The researcher will use the data in dissertation and in publication of articles on the process of creativity. Any publications that result will never identify your personally.

Signature (written consent)

Your signature on this form indicates that you 1) understand to your satisfaction the information provided to you about your participation in this research project, and 2) agree to participate as a research subject.

In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from this research project at any time. You should feel free to ask about anything that is not clear or for new information throughout your participation.

I grant permission to be audio taped: Yes:____ No:____

I wish to remain anonymous, but you may refer to me by a pseudonym: Yes:____ No:____

The pseudonym I choose for myself is:_____

Participant's Name: (please print)_____

Participant's Signature _____Date:_____

Researcher's Name: (please print) ____KrystynaLaycraft____

Researcher's Signature:_____ Date:_____

Questions/Concerns

If you have any further questions or want clarification regarding this research and / or your participation please contact:

Krystyna Laycraft, M.Sc.
Faculty of Education, University of Calgary
krystyna@platinum.ca

If you have any concern about the way you've been treated as a participant, please contact the Senior Ethics Resource Officer, Research Services Office, University of Calgary at (403) 220-3782; email rburrows@ucalgary.ca

A copy of this consent form has been given to you to keep for your records and reference. The investigator has kept a copy of the consent form.

Appendix E: Questions for Interview

Artistic Path

1. Can you share with me **your life path** that brings you to this moment of your life?
 - Can we go back to your **childhood and youth** time? Tell me more about your relation with parents, siblings, and friends?
 - I am especially interested about **emotional life during youth time**? When your interest in art emerged? How did happen? Did you have somebody in life that influences you?
 - I am interested in the **transition from youth time to young adulthood**?
 - What was a role of creativity in this transition?
 - What were your **decisions** in your creative life? (30min)

Personal growth versus artistic growth

2. Can you tell me about yourself as a **human being** and **as an artist**?
 - Do you think that it is some relationship between personal growth (development) and artistic growth (development)? (20min)

The meaning of creativity

3. Now I would like to talk about your **creative activities**?
 - What does **mean** your creativity for you?
 - **Why** do you involve in this activity?
 - What is a **source of your creativity**? (10min)

Process of creativity

4. Can you describe **the process** of your creativity?
 - **How** do you do?
 - How long is the **preparation** period?
 - Do you **daydream** or **meditate**?
 - Do you experience **insight moments**?
 - Are you often in **the flow**?
 - What emotions do you experience during the process of creativity? Are able to monitor your **emotions** during the process of creativity? (20min)

The words stimulation: What do mean for you: **joy, solitude, empathy and intuition**? (20min)

Appendix F: Questions for Interview of Younger Participants

Interest or creative activities

1. I would like to know about your interest and creative activities.
2. When and how your interest begun? Do you have somebody who sparks or motivates you?

Childhood

3. Can you tell me about your childhood? What kind of child you were? Do you have siblings? What relationships you have with your parents and your siblings?

Adolescence

4. Can you tell me about your adolescence time? How do you characterize this time in your life?
5. Have you observed yourself, your emotions, thoughts and behaviour during this time and now?
6. What was a role of your creativity and interest during this time?

Process of creativity

7. Can you describe the process when you approach some challenging project?
8. How do you **feel** when you start, during process and when you accomplish this project?
9. Do you like to learn and experience new things?
10. Do you need **solitude** during this process?
11. Do you daydream often?
12. Do you see images or solutions of your problems in your mind?
13. Are you intuitive person? Do you experience insight moments?

The meaning of creativity

14. What does mean for you creativity?
15. Why do you involve in this activity and do you plan continue this interest in the future?
16. Do you make decisions by yourself or still rely on your parents?
17. Do you like doing long term plans? Do you able to imagine yourself in the future?

Emotional characteristic

18. Are you critical and unsatisfied with yourself?
19. Do you compare yourself to others?
20. Do you have fluctuations of moods or changeable feelings?
21. Do you experience sadness, anxiety or states of depression?
22. Do you experience shame or guilt? Please describe.
23. Do you experience often anger or fear? What emotions are more often in your life?
24. When do you experience a great joy?

Interpersonal skills

- 25. Do you have often conflicts with colleagues and family members?
- 26. Do you act against wrong doing others? How do you feel?
- 27. Do you search for true friendship or love?
- 28. Do you experience empathy for others?
- 29. Do you think that your creativity has an impact on your friends and family members?

Appendix F: Paper 1: “Positive Maladjustment as a Transition from Chaos to Order”

Running head: Positive Maladjustment

Published in Roeper Review, A Journal on Gifted Education, 31: 113-122, 2009

Positive Maladjustment as a Transition from Chaos to Order

Krystyna Laycraft

Center for Chaos Studies

Abstract

Dabrowski's theory of positive disintegration describes patterns and explains mechanisms of human development and has been successfully applied to understanding of gifted individuals. In this article, we show how the concepts of chaos theory and self-organization such as the sensitivity to initial conditions, positive and negative feedback, bifurcation points, and attractors provide new insights into understanding the personality development of gifted adolescents.

According to Dabrowski, positive disintegration is the mental development described by the process of transition from lower to higher levels of mental life and is stimulated by tension, inner conflict, struggle, anxiety, and despair. We introduce a conceptual model of this process as the sequence of transitions from a point attractor (the primary integration) through a periodic attractor (the unilevel disintegration), to a chaotic attractor (the spontaneous multilevel disintegration), and continues through the process of self-organization to an emerging order (the organized multilevel disintegration) and finally to an order with increasing complexity (the secondary integration).

Introduction

During the early eighties I worked as a physicist on some nonlinear phenomena in astrophysics. This was a time when chaos theory, nonlinear dynamics, fractals, and self-organization were widely discussed and applied to a variety of physical, chemical and mathematical problems.

Now, almost a quarter of a century later, I am expanding my interest to psychology, and concentrating on Dabrowski's theory of positive disintegration, which is especially useful for understanding the tumultuous personality development of gifted adolescents.

I am looking at psychological theory through the prism of my knowledge as a physicist. Based on chaos theory, this article provides a contemporary reconceptualization of the theory of positive disintegration and further enhances our understanding of the development of young adolescents.

Frederick Abraham, one of the founders of the Society for Chaos Theory in Psychology, at the First Annual Conference, 1991 wrote:

We believe that chaos represents the true nature of most psychological phenomena. It provides the alphabet of thought, because it represents the complexity of mind, brain, and behavior. We believe that chaos is the archetype that drives the universe, is its deep structure. (Abraham, 1995a)

In this article, I will introduce the basic concepts of the theory of positive disintegration: the levels of development, the developmental potential, and the role of dynamisms. Then I will discuss the main principles of chaos theory and self-organization and show how they provide new insights into understanding the development of gifted individuals.

Theory of Positive Disintegration

The theory of positive disintegration describes patterns and explains mechanisms of human development. Kazimierz Dabrowski (1902 -1980), a Polish psychiatrist and psychologist, developed this theory over a lifetime of clinical and academic work (Dabrowski, 1937, 1964, 1967, 1972, 1973, 1976, 1996; Dabrowski et al., 1970).

The theory of positive disintegration introduces an essential change in adults' attitude toward creative and gifted young people. It leads to a positive understanding of their inner, psychological conflicts and eliminates the negative belief that they require medical treatment. Gifted people display symptoms of increased psychic excitability, nervousness, and psychoneuroses. On one hand, increased psychic excitability is one of the basic causes of inner tension and conflicts within oneself and with the environment. On the other hand, it creates a condition for a broader, deeper, and more complex pattern of experiences. Nervousness and psychoneurotic symptoms are necessary forms of human growth and are signs of the beginning of an advancing process of positive transformation (Dabrowski, 1972, 1996; Dabrowski et al., 1970).

Parents and educators need to know these signs and should create such conditions that “gifted children and adolescents suffer less from unnecessary tension operating on a lower level by activating the processes of development to the more complex, richer and higher levels” (Dabrowski, 1972). This process of complex growth helps young people to take the development into their own hands. Tension and mental disorder on the higher level are much less, and better conditions are being formed for the protection and prophylaxis against serious mental disorder or suicide (Dabrowski, 1972).

Dabrowski postulates that human existence is possible only through multidimensional and multilevel development. Multidimensional development includes all basic mental life, especially innate drives, emotions, intellect, imagination, and aesthetic. Multilevel development consists not only in quantitative growth and replacement of some elements with others, but also acquires new insights and new qualities, which lead individuals to self-organize and develop autonomous, creative and authentic mental structures (Dabrowski, 1964, 1996; Dabrowski et al., 1970).

The Levels of Development

According to Dabrowski, positive disintegration is the mental development described by the process of transition from lower to higher levels of mental life and is stimulated by tension, inner conflict, struggle, anxiety, and despair. It includes five clearly distinguishable levels: (1) primary integration, (2) unilevel disintegration, (3) spontaneous multilevel disintegration, (4) organized multilevel disintegration, and (5) secondary integration.

Primary integration is the least differentiated level of development. It is a rigid and narrow structure. It is automatic and impulsive, determined by primitive, innate drives. Intelligence neither controls nor transforms basic drives. Individuals on this level are not capable of having internal conflicts, although they often have conflicts with their external environment. They are not able to understand the meaning of time and cannot postpone immediate gratification. Individuals cannot follow long-range plans and are limited to the reality of immediate, passing feelings. Disintegration of this primitive structure is possible only if there are nuclei of psychoneurotic traits, or sensitivity, which are acted upon by the very strong positive influence of a highly complex environment (Dabrowski et al., 1970; Dabrowski, 1996).

Unilevel disintegration begins with loosening of the undifferentiated structure of primary integration. Rigidity is replaced by changeable feelings of like and dislike, approach and avoidance, fluctuations of moods, changeable and conflicting courses of action, indecision, and doubt. Patterns of thought are often circular. Internal conflicts appear but they are unilevel. External conflicts persist from primary integration but they are not so aggressive and can be unpredictable. Behavior is conforming to external standards (what people will think or say). In unilevel disintegration, tensions may in extreme cases lead to severe psychosis, phobias, alcoholism, or suicide (Dabrowski et al., 1970; Dabrowski, 1996).

The next developmental level, *spontaneous multilevel disintegration*, is characterized by differentiation of psychological structures and functions. At this time, developmental dynamisms such as astonishment with oneself, disquietude with oneself, dissatisfaction with oneself, feeling of inferiority toward oneself, feeling of shame and guilt, and positive maladjustment appear. Individuals recognize higher and lower levels of experiences and search for examples and models in their external and internal environment. This level is characterized by an increasing role of inner conflict and a gradual decrease in the frequency of external conflict. Internal conflicts reflect a hierarchical structure of cognitive and emotional life: “what is” versus “what ought to be.” A previously unilevel attitude of like and dislike is transformed into an understanding of others and a growing desire to have more selective and deeper emotional relationships (Dabrowski et al., 1970; Dabrowski, 1996).

The fourth level of development is *organized multilevel disintegration*, characterized by conscious transformation of oneself and synthesis that lead to increasing stabilization of the hierarchy of values. The developmental dynamisms that distinctly appear at this level are: "subject-object" in oneself, self-awareness and self-control, identification and empathy,

education of oneself, and auto-psychotherapy. There are existential, philosophical, and transcendental conflicts. Behavior changes toward self-perfection and emotional relationships become deep and enduring (Dabrowski et al., 1970; Dabrowski, 1996).

Secondary integration represents the highest level of development and consists of new organization and harmonization of personality. Personality means a self-aware, self-chosen, and self-affirmed structure. The main dynamisms active at this level are: responsibility for oneself, responsibility for others, autonomy, and authenticity. There is a profound and active empathy toward all people and the individual reaches his own ideal (Dabrowski et al., 1970; Dabrowski, 1996).

The Developmental Potential

Dabrowski introduced the concept of the developmental potential as an original endowment that determines the level of development a person may reach if the physical and environmental conditions are optimal (Dabrowski, 1996; Piechowski, 1975).

It describes the relationship between individual development and three sets of factors which control development. The first factor represents innate constitutional and biological potentialities of the organism. The second set of factors represents all social environmental influences. The third set of factors represents those autonomous processes, which a person brings into his development, such as internal conflicts, self-awareness, choice and decision in relation to personal growth, and conscious inner psychic transformation (Dabrowski et al., 1970).

When the developmental potential is limited to the biological first factor we are dealing with psychopathic individuals indifferent to social opinion and social influences. Such individuals are incapable of reflecting on their actions. In cases where the developmental potential is limited to

the first and the second factors, we are dealing with individuals who, throughout their lives, remain under biological and social influences but lack personal autonomy. Changing influences shift the patterns of their behavior.

The developmental potential may have its full complement of all three sets of factors. In this case individuals consciously struggle to overcome their social indoctrination and constitutional typology. Such people become aware of their own development and their own autonomous hierarchy of values (Dabrowski, 1996).

According to Dabrowski, the developmental potential may be particularly strong when in addition to these three factors there are special abilities and talents and particular strength of self-awareness and self-determination (Dabrowski, 1996).

Based on the observation of creative and gifted individuals, Dabrowski introduced additional factors which are a condition of development through positive disintegration. They are psychic overexcitability: psychomotor, sensual, imaginal, emotional, and intellectual.

Overexcitability is defined as higher than average capacity for experiencing inner and external stimuli and it is based on a higher than average responsiveness of the nervous system (Dabrowski, 1972, 1996). Dabrowski found that heightened overexcitability in gifted and creative people demonstrate their intense daily life experiences. For example: *Psychomotor overexcitability* is a manifestation of a heightened energy level and nervousness, *sensual overexcitability* is expressed in heightened experiencing of sensory pleasures, *imaginal overexcitability* manifests itself through expressive images and metaphors, fantasy, and animistic thinking, *intellectual overexcitability* is most frequently associated with an intensified activity of the mind, theoretical thinking, and avidity for understanding and probing unknown, and *emotional overexcitability* is a function of experiencing emotional relationships, manifested by

strong attachment to persons, living things, or places (Dabrowski, 1996; Piechowski, 1986, 2006; Mendaglio & Tillier, 2006).

The intellectual, imaginal, and emotional overexcitabilities are crucial for personality development. Sensual and psychomotor overexcitabilities play supporting roles in development. The highest level of development is possible if all forms of overexcitability are present and the emotional form is strongest (Dabrowski, 1996).

The five forms of overexcitability undergo extensive differentiation in the course of development. Emotional, intellectual, and imaginal overexcitability play the significant role in the formation of developmental dynamisms which shape and direct personality development (Dabrowski, 1996).

We summarize: the potential development is the constellation of psychological features that are associated with advanced personality development. They are: the three factors (biological, social, and autonomous), special abilities and talents, and the five forms of overexcitability.

Emotions / Dynamisms

There is a wide range of ideas about how to define emotional processes. In developmental psychology, emotions both are regulated and perform regulatory functions. Dodge (1991) states that "all information processing is emotional, in that emotion is the energy that drives, organizes, amplifies, attenuates cognitive activity, and in turn is the experience and expression of this activity." Siegel (1999) sees emotions as the flow of energy, or states of arousal and activation through the brain and other parts of the body. This process emerges from, and directly affects, the further processing of information. Also, emotions can be thought as processes that integrate distinct entities into a functional whole (Siegel & Hartzell, 2004).

Emotions are dynamic processes of change. This is why Dabrowski called these processes developmental dynamisms. Developmental dynamisms are instinctual-emotional-cognitive forces fuelling and shaping emotional development. They can interact either synergistically or antagonistically. Dynamisms fall into two categories: dynamisms that are characterized by spontaneity and lack of definite organization and dynamisms that reshape assimilate and organize the process of positive disintegration (Dabrowski et al., 1970; Dabrowski, 1973, 1996).

Developmental dynamisms are similar to Lewis and Granic's (1999) emotional interpretations (EIs) and Izard's (1984) affective-cognitive structures. Both constructs describes the structures that emerge out of self-organized couplings of the emotional and the cognitive systems. Izard and Lewis recognize that linking emotions to the cognitive systems introduces immense flexibility and variability in emerging structures.

Introduction to Chaos Theory

In a preface of his book, "Mental Growth Through Positive Disintegration", Dabrowski emphasizes that "while clinical studies are quite advanced, experimental research with regard to this theory has not yet progressed enough" (Dabrowski et al., 1970). He describes theory of positive disintegration as "alive" and hopes that it becomes "a marginal element within some future more complete, wider theories as well as the subject matter of creative work of individuals better prepared for this task "(Dabrowski et al., 1970).

In the last thirty years, new ways of study and understanding complex systems have emerged – called chaos theory. Chaos theory is used a conceptual umbrella for various approaches to, and explorations of nonlinear, interdependent, and dynamical systems. Common examples are dynamical system theory (Thelen & Smith, 1994; Abraham et al. 1990), self-organization

(Maturana & Varela, 1992), theory of nonequilibrium phase transition (Haken, 1984,1987), neural nets (Levine, 1991, 1995; Levine et al. 1992), fractals (Mandelbrot, 1982; Lauwerier, 1991), catastrophes theory (Thom, 1972/1975; Zeeman, 1977; Arnold, 1986), and theory of dissipative structures (Prigogine, 1980, 1997; Prigogine & Stengers, 1984).

In this article, I show how the theory of positive disintegration may be reconceptualized using chaos theory. I hope that a new generation of psychologists will be able to continue Dabrowski's work utilizing the wider, dynamic, nonlinear and complex perspectives applying concepts and techniques of chaos theory.

Chaos theory studies open, complex, and dynamic systems that constantly interact with and adjust to their environment, changing, growing, learning, and evolving. Chaotic systems exhibit an extreme sensitivity to their initial conditions. Slight differences in their starting points make a very large difference in their outcomes. Such systems are always on the move, changing, and never precisely recycling to their initial states. One reason that the elements in chaotic dynamical systems are so sensitive to their initial conditions is that these complex systems are subject to *feedback*. Systems that change radically through their feedback are said to be *nonlinear*. In some conditions nonlinear systems behave in a regular, cyclical manner until something sets them off; a critical point is passed: suddenly they go chaotic. This critical point where a system changes character of the motion is called a *bifurcation point*. The complex states of chaotic motion are called *attractors*. An attractor is a state to which a system is drawn by its own nature. Examples of such systems are everywhere around us and inside of us. They are our bodies, our brains, our consciousness, our psyche, our creativity, our lives, our organizations, our schools, our families, nature, weather, and many more (Lorenz, 1993; Briggs & Peat, 1990, 1999; Butz et al., 1997; Kelso, 1995; Freeman, 2000).

Feedback & Bifurcation

In chaotic systems, everything is connected to everything else through *negative* and *positive feedback* (Briggs & Peat, 1990, 1999). Negative feedback is the type that keeps things in check and is responsible for the stability of a system. Processes characterized by positive feedback, where “more” leads to “more” and “less” to “less”, are important in accounting for escalating patterns of system change. In nonlinear dynamic systems, through the process of positive feedback, abrupt changes of behavior can be observed. These changes called phase transitions or *bifurcations*, occur when system orderliness breaks down, sensitivity to perturbations increases, and new patterns of organization rapidly self-amplify (Prigogine & Stengers, 1984; Kelso, 1995). Preceding a bifurcation point, a system can be well behaved; but as a bifurcation is approached, the system's trajectory becomes random and unpredictable (large fluctuations occur) (Prigogine & Stengers, 1984). At this point, the system "hesitates" among various different possible directions of change. Even little fluctuations in the subsystems can combine through positive feedback loops, becoming strong enough to shatter any pre-existing organization. At this point, the disorganized system either disintegrates into chaos, or leaps to a new higher level of order of organization. Through this means order arises spontaneously, through self-organization (Nicolis & Prigogine, 1989).

When we think of ourselves as complex systems, bifurcation points can be viewed as special events along the flow of our lives during which choices can be made to influence future possibilities.

Psychological bifurcations are the rapid transformations of sensory, perceptual, cognitive, and affective experiences that may radically alter our lifestyle. They appear in the process of

learning, in motivational states, in brain activity, in developmental stages and in their associated increasing complexity, in personality and family organization (Abraham, 1995b).

Here are some examples of psychological bifurcation points: (a). "aha" moments or insight experiences, when rapid perceptual or cognitive restructuring takes place in the context of working on a difficult problem; (b) moments when we experience overwhelming emotional transformations (e.g. falling in love); and (c) the moment when "of body" information rises to attention (e.g. feeling of hunger) (Gilgen, 1995).

Attractors

Attractors are useful for characterizing the behavior of a system; the same system can be characterized with different types of attractors at different times in its development.

There are three types of attractors: (a) point attractor, (b) periodic attractor, and (c) strange or chaotic attractor.

The point attractor (Abraham & Shaw, 1984; Briggs & Peat, 1990; Gleick, 1988; Kelso, 1995) is the most predictable. We can compare a point attractor to a fixation on one desire. A point attractor is a single-minded attractor: black or white, good or bad, hate or love. In life dynamics the attractor of death is the ultimate point attractor. As far as life dynamics of each individual are dissipative, they "shrink" with time, gradually (or suddenly) stop to be connected with any other attractors of life activity and fall into the fixed-point attractor (Dimitrov, 2004).

To the group of *periodic attractors* belong a cycle attractor and a torus attractor.

The characteristic of *the cycle attractor* (Abraham & Shaw, 1984; Briggs & Peat, 1990; Gleick, 1988; Kelso, 1995) is the ability to resist change. Both the point and the cycle attractors describe systems that are highly regular, and thus, predictable. Routine is the perfect life example for the

cycle attractor: when we are attracted to two activities, we tend to oscillate between them (e.g., work and family).

The three-dimensional attractor is *the torus attractor* (Abraham & Shaw, 1984; Briggs & Peat, 1990). It is a complex cycle which moves forward and thus is different while repeating itself. The torus attractor has a higher degree of regularity and complexity than the cycle attractor, but the pattern is fixed and finite. An example of the torus attractor is a complex set of attracting events that occur to a person on many levels over the course of a year. Then these events repeat again, year in and year out.

The *strange* or *chaotic attractor* (Lorenz, 1993; Gleick, 1988; Kelso, 1995) describes systems that are in a state of turbulence, such as a violent river or brain activity. The chaotic attractors can take an infinite number of different forms. Their patterns are fantastic, complex maps that capture the interplay between stability and change in a system. Essentially, a chaotic attractor is a process that unfolds through the complex interactions between elements in a system. It is through a pattern of folding and stretching that the structure of the chaotic attractor emerges. Chaotic attractors are the foundation for hidden order in natural systems.

Self-organization

Self-organization is a most important subject for psychology. All living (Maturana & Varela, 1992) and psychological systems (Abraham, 1995b; Lewis & Granic, 1999; Lewis, 1997, 2000, 2005) are self-organizational.

Self-organization is a process whereby an open, nonlinear and complex system acquires a new internal state without specific interference from the outside. With a continuous change in one or more control parameters, new states emerge spontaneously purely as a function of the

inner dynamics of non-linear interactions between the system's components. The control parameter creates the necessary conditions for far from equilibrium states and critical fluctuations. Near equilibrium fluctuations are harmless, but far-from-equilibrium, they play a central role (Prigogine, 1997). Fluctuations are continuously probing the system and providing an opportunity to discover new patterns (Kelso, 1995). The emerging patterns are created by the coordination between the parts of the system, but in turn influence the behavior of the parts. This is called a circular causality (Haken, 1987).

Prigogine introduced the concept of "dissipative structures" (Prigogine, 1980, 1997; Prigogine & Stengers, 1984). Such structures, to maintain their existence, must interact with their environment continually, maintaining the flow of energy into and out of the system. Prigogine and Stengers write: at equilibrium molecules behave as essentially independent entities; they ignore one another. However, non-equilibrium wakes them up and introduces coherence quite foreign to equilibrium. This is the concept of "order through fluctuations" (Prigogine & Stengers, 1984).

Self-organizing systems become more ordered and more complex over time. Both increasing order and increasing complexity rely on a basic mechanism of self-organization, the coupling of reciprocally interacting system elements (Lewis, 2000).

Positive Disintegration as a Transition from Simplicity to Complexity

I. Transition from Order to Chaos

In this chapter, we apply the concepts of chaos theory and self-organization to the processes of positive disintegration.

Gifted children or young people are extremely sensitive to external and internal world. This sensitivity (excitability) attracts them to new experiences, which are creating a wider spectrum of feelings, inner tensions, and conflicts with oneself and with the environment. Such processes as anxiety, dissatisfaction with oneself, fear, guilt, etc., are essential for positive changes in their mental structure.

We discuss here the transition from the lowest level (the primary integration), through the unilevel disintegration to the first phase of multilevel disintegration (the spontaneous multilevel disintegration). The period of the spontaneous multilevel disintegration is the most crucial and dramatic for young people.

Mental structure is a complex, nonlinear, dynamic, and open system, constantly interacting with the internal and external environment. It goes through bifurcation points of instabilities and fluctuations (emotions) transforming into new structures of increased complexity and acting as attractors.

The lower levels of mental structure are organized more rigidly and operate more automatically than the higher levels. The first level of positive disintegration, primitive integration, characterized by the first factor and a cohesive and automatic organization, can be described by a point attractor. The second level, unilevel disintegration, characterized by the first and second factor, lack of organization, and continuous fluctuations between “what is” and “what ought to be” is described by a periodic attractor. The transition from the first level to the second level is possible only if there are some nuclei of disintegration and/or sensitivity to the external environment. The environment must be particularly favourable in providing influences

toward the changes of feelings for others. Grave life experiences and stresses may facilitate the process (Dabrowski, 1996). Martens (2003) observed that grief, death of a beloved person, friend or partner may bring in psychopath guilt, self-reflection, and social-emotional and moral maturation. A serious or chronic disease will likely bring about a radical change in a psychopath's life and attitude (Martens, 2003). It means that the control parameter changes to the second factor and external influences begin to operate.

This transformation can be modelled by the supercritical Hopf bifurcation (soft excitation), when a periodic attractor emerges gradually from a stable fixed point attractor as a control parameter is gradually varied or by the subcritical Hopf bifurcation (hard excitation), when the periodic attractor appears suddenly with finite amplitude at a critical parameter value (Kelso, 1995; Abraham, 1995b).

As development continues, the third factor (the autonomous processes) starts to operate. In the unilevel disintegration, there may arise a need for differentiation and hierarchization, for replacing the repetitious and tiresome "what is" with "what ought to be". A multilevel process emerges and a hierarchical structure of greater complexity of inner processes appears (Dabrowski, 1996). This state is dramatic, sometimes tragic, marked by a sharp turning toward oneself in order to seek solutions within oneself (Dabrowski, 1972). The chaotic behaviour of this level is a result of a complex cooperation between different dynamisms. Developmental dynamisms (astonishment towards oneself, disquietude with oneself, dissatisfaction with oneself, feeling of inferiority and guilt) act as loops of positive feedback, pushing mental structure into a state of disequilibrium, and creating instability. The instability disintegrates a former structure and forms novel patterns of behaviour. This level can be described by a chaotic attractor. At this level, mental structure starts to be more "open" to inner and external environments. A transition

between the unilevel disintegration and the spontaneous multilevel disintegration can be modelled by a subtle bifurcation when a periodic attractor changes into a chaotic attractor as a control parameter is varied (Abraham, 1995b).

We observe here, the sequence of transitions, from the point attractor (the primary integration), through the periodic attractor (the unilevel disintegration) to the chaotic attractor (the spontaneous multilevel disintegration) (see figure 1).

Similar phenomena were observed in many physical, chemical, and biological systems. For example, fluid turbulence provides a classic example where, as a parameter (the Reynolds number) increases, the motion can undergo an abrupt transition from some stable configuration (laminar flow), more cyclic (vortices) into chaotic regime (turbulence) (Tritton, 1988). In biology, a study of the biological populations shows a rich spectrum of dynamic behaviour, from stable point, through cascades of stable cycles, to a chaotic regime (May, 1976).

In the famous paper “Period Three Implies Chaos,” Li and Yorke (1975) introduced a new word “chaos” as a mathematical term to describe the nonperiodic dynamics and made researchers aware of the fact that simple non-linear equations in a dynamical model may lead to chaotic solutions.

II. Chaos

The spontaneous multilevel disintegration represents a state of disequilibrium (far-from-equilibrium). Prigogine (1997) stated, “Matter acquires new properties when far-from-equilibrium in that fluctuations and instabilities are now the norm. Matter becomes more “active”.”

This period is characterized by turning toward oneself and seeking solutions within oneself. Internal conflicts, psychoneurotic depressions, anxieties, and obsessions are fluctuations and instabilities in the mental structure. They play a crucial role in behavioural pattern formation and through them, the abrupt changes in human behavior can be observed. Even little fluctuations in the system can combine through positive feedback loops and become strong enough to shatter pre-existing organization. At this bifurcation point, the disorganized system either disintegrates into chaos, or leaps to a new higher level of order of organization. Through this means order arises spontaneously, through self-organization (Nicolis & Prigogine, 1989; Kelso, 1995; Prigogine, 1997).

One of Dabrowski's patients expressed it in the following way: "With my extreme sensitivity I am in such a cruel state of mental tension that I have only two solutions: to commit suicide or to find an effective way of changing myself." (Dabrowski, 1972)

Self-organization mainly refers to control of a system from within the system by acting upon its control parameters (Abraham, 1995b).

The first phase of spontaneous multilevel disintegration is characterized by emotional-cognitive dynamisms, which create states of self-observation, self-reflection, self-awakening, self-criticism, and self-awareness.

The following fragment, taken from the diary of a sixteen year old girl, illustrates the complexity of her state, from self-observation, through self-criticism to desire to change.

"I just finished reading "Contemporary Youth" by Jaworczakowa. Great book. But it makes me feel depressed. I learned from this book about my peers, that they are so intelligent, so open minded, so full of energy and ideas. I don't know if she exaggerated, idealized these young people, or am I so stupid. I don't know how to

clearly formulate my thoughts or maybe I don't have my own thoughts. My great desire is to be able to express myself and deepen my knowledge. I don't know what is going on with me. I know that, whatever it is, it is not good..." (Troszkiewicz, 1966).

The dynamisms of the first phase of multilevel disintegration are primarily the product of emotional overexcitability, and the intellectual overexcitability enhances the development of self-awareness (Dabrowski, 1996).

Further emotional-cognitive development creates a new class of emotions called: self-conscious emotions. They appear in the second phase of spontaneous multilevel disintegration. Self-conscious emotions include embarrassment, shame, guilt, and pride.

These emotions require the ability to evaluate one's self and to infer the mental states of others (Dabrowski, 1996). Self-conscious emotions are important for helping individuals recognize and correct their social mistakes, strengthen social bonds, renew commitment to relationships, and motivate positive behaviour. They provide internal feedback about a specific goal, expectation, or standard that has been violated. Violations of social conventions may result in embarrassment. Violations of character ideas are associated with shame. Violations of rules, related to harm, justice, and rights are related to guilt (Tangney et al., 1996; Keltner & Buswell, 1997).

The following fragment from the diary of a seventeen year old girl illustrates her critical and condemning attitude toward herself, dissatisfaction with herself and feeling of shame and guilt in relation to her mom and herself.

"Tears are the expression of a variety of feelings; enjoyment, sadness, anger, delight, nervousness, doubt in ourselves and fight with ourselves. Ever since yesterday, I experience the fight with myself. I can't get along with my brother. I know that he is not bad, but he is stubborn like me and very hot tempered... Above all I think about

my mom, who knows how much bitterness and nervousness is created by one stupid quarrel. After each fight I find that it is low and inhuman. I don't wish anybody to experience these horrible moments..." (Troszkiewicz, 1966).

The third phase of spontaneous multilevel disintegration is characterized by *positive maladjustment*, which is a conscious and selective rejection, a need for adaptation to higher hierarchy of value, and a lack of adjustment to certain external or internal dynamisms. It expresses the drive toward accelerated development, self-perfection, and realization of the attitude of autonomy and authenticity. The dynamism of positive maladjustment is connected with the understanding of others and their needs (Dabrowski, 1973).

The other fragment from the diary of a seventeen year old girl illustrates these emotions.

"I think that I am bad. I am trying to change myself, to be more feminine.

I want to be more serious, more thoughtful and have more time for my parents.

I love them so much.

When I write it I almost cry...

I promise here this:

I will read more, not only prose but also poetry

I will be helpful to mom and I'll be good for dad

I will not argue with my brother, and I will control my feelings of anger..."

(Troszkiewicz, 1966).

According to Dabrowski's theory, development of young gifted people is impossible without transition through "chaotic" processes of nervousness and psychoneuroses, without external and internal conflicts, and without positive maladjustment. All of these processes represent

behavioral complexity in the form of protective, prophylactic, and developmental dynamisms (see figure 2).

III. Transition from Chaos to Order

As the development continues, the individual takes an initiative in organizing a hierarchy of his own inner world. This is period of the organized multilevel disintegration, directed and controlled by highly conscious, autonomous and self-determining developmental processes. They act as negative feedback to stabilize and organize a mental structure. This stage of development is characterized by lesser tension and greater ability to systematize experiences and to take the development into one's own hands (Dabrowski, 1972). Higher levels of emotional and emotional-intellectual functions produce greater psychic complexity, higher levels of creativity, self-awareness, empathy, and social responsibility. The intellectual and emotional functions interconnect and reciprocally advance the level of the other functions. This level is characterized by openness to external experiences, sensitivity and identification with others. We can compare this level to "dissipative structures", which maintain their existence by interaction with their environment and maintaining the flow of energy into and out of the system (Prigogine, 1980, 1997; Prigogine & Stengers, 1984). Mental structure transforms itself into a new ordered state of increased complexity and therefore stability.

As a control parameter becomes more complex, including all forms of overexcitability and special abilities and talents, the highest level of development can be reached. This is the secondary integration, characterized by a new organization and harmonization of personality,

autonomy and authenticity (Dabrowski, 1972, 1996). Maximal complexity is achieved by the combination of differentiation and integration of emotional-cognitive functions within the structure (Siegel, 1999; Edelman & Tononi, 2000; Edelman, 2004).

We can summarize: Positive disintegration continues through the process of self-organization, from the chaotic attractor (the spontaneous multilevel disintegration), an emerging order (the organized multilevel disintegration) to an order with increasing complexity (the secondary integration) as the potential development (the control parameter) becomes more complex (see figure 1).

Lately, many models of personality development based on the concepts of self-organization have emerged (Lewis, 1997, 2000; Lewis & Ferrari, 2001; Izard, 1984; Izard et al., 2000; Magai & Nusbaum, 1996). According to these models, personality is a self-organizing system that converges to its own unique forms by recurrent patterns of cognition-emotion interactions (Lewis, 1997, Lewis & Ferrari, 2001) or is the construction of affective-cognitive structures that generate characteristic behaviours indicating trait-like qualities (Izard, 1984). These models provide new and promising insights into the study of human development. It will be interesting to compare the theory of positive disintegration, which is characterized by comprehensive and extensive clinical studies, with these theoretical models.

Conclusion

Based on chaos theory, we introduce a conceptual model of the positive disintegration as a sequence of transitions from a point attractor (the primary integration) through a periodic attractor (the unilevel transformation), to a chaotic attractor (the spontaneous multilevel

disintegration), and then continues through the process of self-organization to an emerging order (the organized multilevel disintegration) and finally to an order with increasing complexity (the secondary integration).

In accordance with Dabrowski's theory of positive disintegration, we demonstrated that the crucial period for gifted adolescents' development is the spontaneous multilevel disintegration. It represents a far-from-equilibrium state that is a necessary condition for self-organization to more complex and ordered states of mental structure of young people. Through this process, they become active agents in their disintegration, responsible for their own lives, and able to channel their tensions "upward" through developmental dynamisms of higher levels.

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Figure Caption

Figure 1 Transition from order to chaos and from chaos to order

Figure 2 Matter complexity to behavioral complexity through instabilities

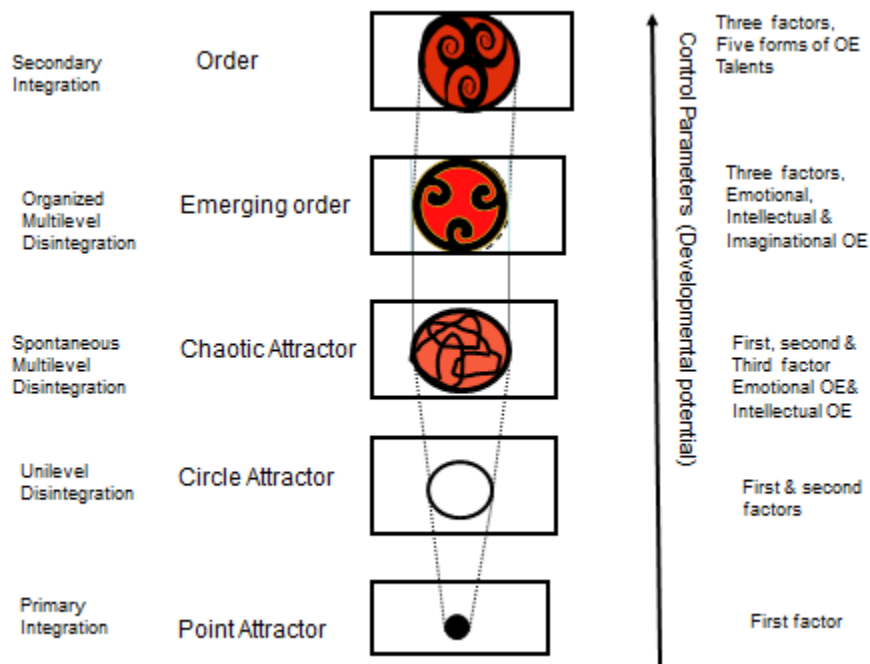


Figure 1. Transition from order to chaos and from chaos to order

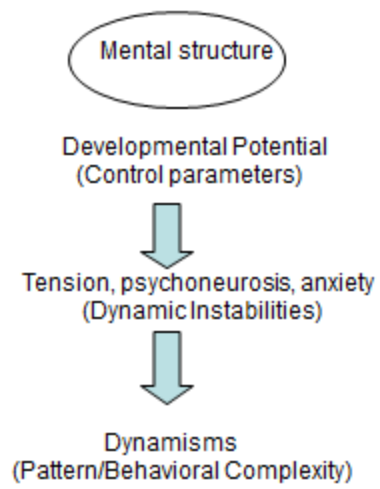


Figure 2. From material complexity to behavioral complexity through instabilities
(based on Kelso, 1995)

Appendix H: Paper 2: “Theory of Positive Disintegration as a Model of Adolescence Development”

Theory of Positive Disintegration as a Model of Adolescent Development

Krystyna Laycraft,

*The University of Calgary, Graduate Division of Educational Research, Calgary, Alberta,
Canada*

&

Center for Chaos Studies, P.O. Box 549, Nanton, Alberta, Canada, T0L 1R0,

email: krystyna@platinum.ca, ph: 403 646 2576, fax: 403 646 0099

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Abstract: *This article introduces a conceptual model of the adolescent development based on the theory of positive disintegration combined with the theory of self-organization. Dabrowski's theory of positive disintegration, which was created almost a half century ago, still attracts psychologists' and educators' attention, and is extensively applied into studies of gifted and talented people. The positive disintegration is the mental development described by the process of transition from lower to higher levels of mental life and stimulated by tension, inner conflict, and anxiety. This process can be modeled by a sequence of patterns of organization (attractors) as a developmental potential (a control parameter) changes. Three levels of disintegration*

(unilevel disintegration, spontaneous multilevel disintegration, and organized multilevel disintegration) are analyzed in detail and it is proposed that they represent behaviour of early, middle and late periods of adolescence. In the discussion, recent research on the adolescent brain development is included.

Key Words: self-organization, complexity, order, attractor, phase transition, brain

INTRODUCTION

This article provides a contemporary approach to the theory of positive disintegration (TPD) and further enhances our understanding of adolescent development.

In the first part of this article, the basic concepts of the TPD are introduced: the developmental potential, the role of dynamisms, and the levels of development. In the second part of this article, an extensive analysis of three disintegration levels is provided by combining TPD with the main principles of self-organization. They represent the behavior of early, middle, and late period of adolescence. Further, recent research on the adolescent brain development is included and its relationship to the disintegration levels is discussed.

THEORY OF POSITIVE DISINTEGRATION

TPD describes patterns and explains internal processes of human development.

Kazimierz Dabrowski (1902 -1980), a Polish psychiatrist and psychologist, developed this theory over a lifetime of clinical and academic work (Dabrowski, 1964, 1967, 1972, 1973, 1976, 1996; Dabrowski, Kawczak & Piechowski, 1970; Dabrowski & Piechowski, 1977 a, 1977 b). Over the past thirty years, TPD has been successfully applied to the field of gifted education and an

understanding gifted development (Piechowski, 1979, 1986; Silverman, 1993, 2008; Mendaglio & Tillier, 2006; Silverman & Ellsworth, 1981; Pyryt, 2008; Ackerman, 1997; 2009; Mroz, 2009). Thanks to William Tillier, a last graduate student of Dabrowski, TPD is widely available through a website (Tillier, 2008) dedicated to the theory. It contains an archive of Dabrowski's original works and publications of others. Unfortunately, TPD is still relatively unknown as a theory of human development.

Dabrowski's theory emphasizes the role of emotions in the human development. His ideas converge with the contemporary theories of personality development based on the concepts of self-organization (Izard, 1984; Izard et al., 2000; Lewis & Granic, 1999).

The main difference between Dabrowski's theory and the other developmental theories (Freud, Rogers, Maslow and Piaget) is how it sees the role of psychoneuroses in the process of human development. The most of developmental theories represent the traditional view that neuroses and psychoneuroses impede the human growth and must be eliminated. Dabrowski's view is completely different. He stresses the importance of "emotional turbulence" in the process of transition from the lower to higher levels of mental life. He states that that nervousness and psychoneurotic symptoms (anxiety, depression) are necessary for human growth and are signs of the beginning of an advancing process of positive transformation (Dabrowski, 1972, 1996; Dabrowski et al., 1970). Dabrowski wrote: *"Such conflict is a necessary prelude to the gradual process of adaption to new external and internal conditions. This results in a disequilibrium, which allows the emergence and organization of new levels of control, higher than those of the previous stable period"* (Dabrowski, 1996, p. 11). This idea corresponds to the Prigogine's concept that "non-equilibrium is a source of order" (Prigogine & Stengers, 1984).

Dabrowski stresses that only through the process of positive disintegration, individuals are able to make themselves independent of the lower external and internal environments. The lower level of functioning must break down (“disintegrate”) before it is replaced by a new organization of a higher level. The positive disintegration is then a twofold process: (i) reorganization of the lower level of functioning of a mental structure and (ii) construction of a new higher level organization. In the other words, *development is a function of reorganization of mental structure*. The multilevel development consists not only in a quantitative growth and replacement of some elements with others but acquires new insights and new qualities, which lead individuals to self-organize and develop autonomous, creative, and authentic mental structures (Dabrowski, 1964, 1996; Dabrowski et al., 1970). This is self-organizing and nonlinear process, which implies increasing complexity of mental structure that differentiates - incorporates more and more elements from all basic mental life, especially, emotions, thoughts, imagination, and memories and then integrates - constructs connections between these components. Dabrowski wrote: *“The intellectual functions are always interconnected with and dependent on emotions and drives, but the form of this connections changes according in the phase of development... At higher stages of development both the intellectual and emotional functions come into an increasingly closer inter-connection, reciprocally advance the level of the other functions...”*(Dabrowski et al., 1970, p.136).

The Developmental Potential

The key concept of TPD is the *developmental potential*. Dabrowski defines it as an original endowment which determines what level of development a person may reach if the physical and environmental conditions are optimal (Dabrowski, 1996; Piechowski, 1979, 1986).

Potential development contains three sets of factors which control development and the psychic *overexcitability (OE)*. The first factor represents innate constitutional and potentialities of the organism. The second set of factors represents all social environmental influences. The third set of factors represents those autonomous processes which a person brings into his development, such as internal conflicts, self-awareness, choice and decision in relation to personal growth, and conscious inner psychic transformation (Dabrowski et al., 1970). The psychic overexcitability is defined as higher than average capacity for experiencing inner and external stimuli and it is based on a higher than average responsiveness of the nervous system (Dabrowski, 1972, 1996). OE is similar to the concept of high sensitivity which leads towards high excitability (Aron, 1996; Eigen, 2004). Piechowski (2006), a close collaborator of Dabrowski suggested even to change this term to *heightened excitability* which is a better translation of the Polish word *nadpobudliwosc*.

Since the mid 1970s, extensive studies are conducted based on the *Overexcitability Questionnaire (OEQ)* (Lysy, 1979; Lysy & Piechowski, 1983) in the United States, Venezuela (Falk et al., 1997), and Turkey (Yakmaci-Guzel & Akarsu, 2006). The studies in the United State and Venezuela demonstrated that artists exhibit high levels of imaginal, intellectual, and emotional OE. Results from the Turkish study show that students with high intellectual abilities score higher on imaginal and intellectual OE as compared to students with low intellectual abilities.

In the nineties, the *Overexcitability Questionnaire – Two (OEQ II)* was created by a group of scientists from the Institute for the Study of Advanced Development (Falk et al., 1999). It has been translated into many languages like Chinese, Spanish, Turkish, and Korean. The findings from studies of gifted and talented individuals in Spain, Mexico, Taiwan, and Turkey

show cross-cultural validity for the concept OE and that OE is able to differentiate gifted from non-gifted populations (Falk et al., 2008).

There are five forms of psychic overexcitability: psychomotor, sensual, imaginal, emotional, and intellectual. For example: *Psychomotor overexcitability* is manifestation of a heightened energy level and nervousness, *sensual overexcitability* is expressed in heightened experiencing of sensory pleasures, *imaginal overexcitability* manifests itself through expressive images and metaphors, *intellectual overexcitability* is most frequently associated with an intensified activity of the mind and theoretical thinking, and *emotional overexcitability* is a function of experiencing emotional relationships (Dabrowski, 1996; Dabrowski & Piechowski, 1977a; Piechowski, 1986, 1999, 2006; Mendaglio & Tillier, 2006). The intellectual, imaginal, and emotional overexcitability are crucial for personality development. Their products are developmental dynamisms, i.e. the intra-psychic factors which shape and direct development (Dabrowski, 1996).

Developmental Dynamisms

Developmental dynamisms are instinctual-emotional-cognitive forces fuelling and shaping emotional development. They fall into two categories: dynamisms which are characterized by spontaneity and lack of definite organization, and dynamisms which reshape, assimilate, and organize the process of positive disintegration (Dabrowski et al., 1970; Dabrowski, 1973; Dabrowski, 1996). Dynamisms from the first category act as a positive feedback pushing a mental structure to change and create complex and chaotic behaviour. For example, the dynamism *astonishment with oneself* expresses the authentic observation of oneself and causes a critical attitude to oneself. It is the beginning of the desire for change. Dynamisms from the second category act as a negative feedback and are responsible for stability and order.

An example for this kind of dynamisms is *self-control*. It is a highly conscious dynamism of bringing order and unity into one's development. A variety of dynamisms will be extensively discussed in the second part of this article.

Developmental dynamisms are similar to Lewis and Granic's (1999) emotional interpretations (EIs) and Izard's (1984) affective-cognitive structures. These constructs describe the structures that emerge out of self-organizing couplings of elements of the emotional systems and the cognitive systems. Izard and Lewis recognize that linking emotions to the cognitive systems introduces immense flexibility and variability in emerging structures.

The Levels of Positive Disintegration

To understand the theory of positive disintegration, it is important to distinguish a difference between development through stages and development through levels.

The first is biological development, going through determined periods common to human beings and to animals. The second is psychical development and depends on individual, self-conscious work on himself, on his reflection, on his responsibility for his action, and his choices.

According to Dabrowski, the positive disintegration is the multilevel development where each level represents a qualitatively distinct, relatively stable and coherent developmental structure, characterized by a distinctive set of developmental dynamisms.

The positive disintegration includes five clearly distinguishable levels: (1) primary integration, (2) unilevel disintegration, (3) spontaneous multilevel disintegration, (4) organized multilevel disintegration, and (5) secondary integration (Dabrowski et al., 1970; Dabrowski, 1996).

The first level - *primary integration* defines narrow, rigid, automatic structure governed by the first factor. No developmental dynamisms are associated with this mental structure.

Individuals on this level are not capable of having internal conflict, although they often have conflicts with their external environment. Individuals cannot follow long-range plans and are limited to the reality of immediate, passing feelings (Dabrowski et al., 1970; Dabrowski, 1996). Strong external stimuli like grave life experiences and stresses may only temporarily bring some psychic changes (reflection), but they are short and ineffective. The system quickly returns to this same pattern of primary integration behavior (Dabrowski & Piechowski, 1977).

This level is comparable to the Kohlberg's pre-conventional level characterized by egocentric attitude (stage 1- obedience and punishment) (Kohlberg, 1969) and the Kegan's first order of consciousness (Incorporate and Impulsive stages) represented by awareness which is fixed upon sensation and impulses (Kegan, 1994).

The next three levels: *unilevel disintegration*, *spontaneous multilevel disintegration*, and *organized multilevel disintegration* will be extensively discussed in the next section.

The fifth level - *secondary integration* represents the highest level of development and consists of new organization and harmonization of personality. Personality means a self-aware, self-chosen, and self-affirmed structure. The main dynamisms active at this level are: responsibility for oneself, responsibility for others, autonomy, and authenticity. There are no internal conflicts. There is a profound and active empathy toward all people and the individual reaches his own ideal (Dabrowski et al., 1970; Dabrowski, 1996).

This level is comparable to the Kohlberg's post-conventional level (stage 6) characterized by mutual respect as a universal ethical principle (Kohlberg, 1969) and the Kegan's fourth order of consciousness (self-authorizing) characterized by self-regulation, self-formation, identity, autonomy, and individuation (Kegan, 1994).

THE ADOLESCENT DEVELOPMENT

In the second part of this article, the process of adolescent development is analyzed in detail by combining the theory of positive disintegration with the theory of self-organization. Adolescent development can be expressed by the three levels of positive disintegration: the early period of adolescence described by the unilevel disintegration, the middle period of adolescence described by the spontaneous multilevel disintegration, and the late adolescence and young adulthood described by the organized multilevel disintegration (see Fig.1).

Each level is a relatively stable and coherent configuration of developmental dynamisms characterized by a unique pattern of behavior. In dynamic systems terminology, this behavioral mode is an attractor state, assuming that the complex system self-organizes into a few modes of behavior rather than remain unconnected collections of features (Thelen & Smith, 1998; van Geert, 2009).

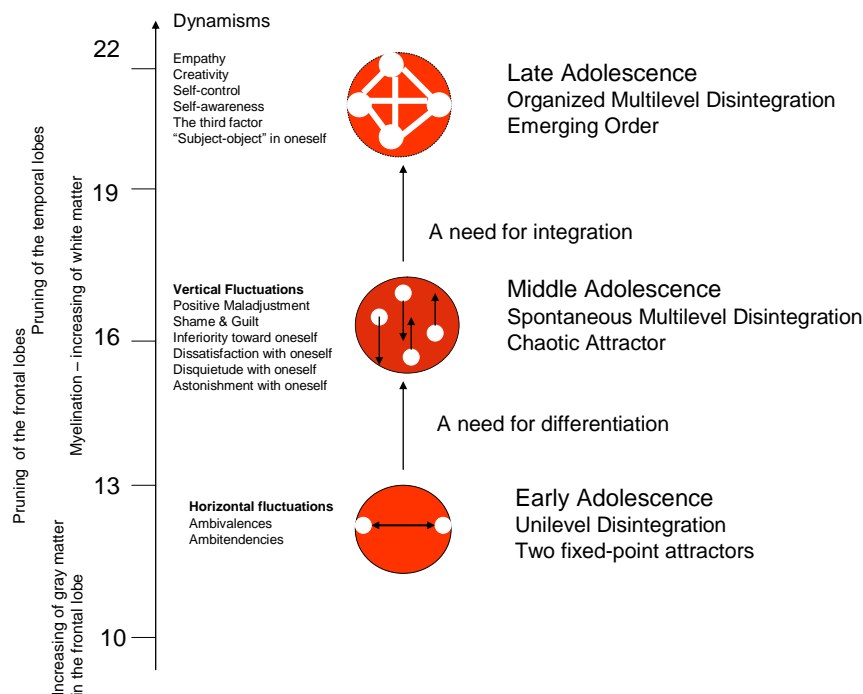


Figure 1

The Unilevel Disintegration

The *unilevel disintegration* defines a mental structure governed by the first and the second factors is characterized by fluctuation of opposing feelings, conflicting course of action, circular pattern of thoughts, and social influences. The unilevel disintegration can be described by the *limit-cycle attractor* or by the *two fixed-point attractors*. It may be difficult to distinguish between these two attractor states. In both cases, the system oscillates between two different states over time (Vallacher & Nowak, 2009). The degree of instability varies in this level and it has many different patterns of behavior. Two cases of the unilevel disintegration are discussed.

Case 1: The “unhealthy” unilevel disintegration can be described by a limit-cycle attractor, characterized by the pattern of changes between states without any particular state. Dabrowski called it “no exit” state. The experienced tension may be transposed to the body, giving rise to psychosomatic disorders. Very often the individuals escape into alcohol, drugs, or suicide (Dabrowski, 1996; Dabrowski & Piechowski, 1977).

Case 2: The “developmental” unilevel disintegration can be described by a set of two fixed-point attractors which displays a tendency to stabilize on a particular state and external stimuli are necessary to push system from one state to another (Vallacher & Nowak, 2009). This pattern is observed in early adolescence when young people can only think about isolated characteristic of the self (“...I am intelligent, gifted. But then, I see myself as a fool.”) or experience opposing emotions (approach and avoidance or joy and sadness) (Dabrowski & Piechowski, 1977a).

Similar observation was done by Fisher (1980) who argues that young adolescents lack of cognitive control and as a result they can only think about isolated characteristics of the self and are not able to integrate the many single abstractions of the self constructed in different relational

contexts. This contributes to unrealistic self-representations, oscillating between very opposite emotions; at one point of time one feels intelligent, whereas at another point in time, one may feel stupid.

This level is similar to the Kohlberg's pre-conventional level (stage 2 – self-interest orientation) (Kohlberg, 1969) and the Kegan's second order of consciousness (the imperial stage) characterized by concreteness point of view and lack of abilities to take own point of view and another's simultaneously (Kegan, 1994).

Transition from the Second Level to the Third Level

As development continues, the third factor (the autonomous and intrapsychic processes) starts to operate and the unilevel disintegration bifurcates to the multilevel hierarchical organization (the spontaneous multilevel disintegration). In the unilevel disintegration, there begins a need for differentiation and hierarchization. There are vertical conflicts of value between “what is” and “what ought to be” which arise from an intense personal experience of becoming aware of different levels of every aspect of human life. This state is dramatic, marked by a sharp turning toward oneself in order to seek solutions within oneself (Dabrowski, 1972). The transition from a unilevel to a multilevel phase of development is the most crucial and the most unexpected developmental event. This process is similar to Mahoney's “personal revolution” (Mahoney, 2003). There is a discontinuity between these two levels. Such discontinuity (e.g., phase transitions, bifurcations, or catastrophe) can be studied by theoretical models of different branches of non-linear dynamical systems theory such as catastrophe theory (Thom, 1975), theory of dissipative structures (Nicolis & Prigogine, 1977; Prigogine, 1980, Prigogine & Stengers, 1984), and synergetics (Haken, 1984, 1987).

General mechanism for phase transitions is based on the notion of self-organization in complex, nonlinear systems. As the control parameter passes through a critical point, a qualitative change in the attractor may take place and the system finds a new pattern of behavior. Phase transitions are characterized by global reorganization, where new configurations require the cooperation of all system components.

The phase transition between the unilevel disintegration and the spontaneous multilevel disintegration is characterized by an abrupt change from horizontal (the limit-cycle attractor or by the two fixed-point attractors) to vertical motion when a control parameter (the potential development) approaches the third factor (the autonomous processes). Dabrowski writes: *“The appearance of a split between the “lower” and the “higher” marks the emergence of a vertical direction in development which pushes from within, as it were, and is strongly felt but not entirely clear to the individual as to its nature, hence the name ‘spontaneous’ ”* (Dabrowski, 1996, p.35).

This transition can be modeled by the cusp catastrophe that has been applied to many fields (Zeeman, 1976; Guastello, 1984; van der Maas & Molenaar, 1992; Wagenmakers, van der Maas, & Molenaar, 2005). The cusp catastrophe model is very useful in detection specific behavioral phenomena that occur in the cusp, so-called catastrophe flags (Glimore, 1981). The main catastrophe flags are: the sudden jump in behavior, bimodality – two states exist simultaneously, hysteresis – regression in development, and divergence – the system has to “choose” between the two emerging states. A detailed study of the level-to-level transitions of Dabrowski’s theory connected with catastrophe theory are planned in the future.

The Spontaneous Multilevel Disintegration

The third level – *spontaneous multilevel disintegration* defines an extensive differentiated mental structure, governed by intrapsychic processes (intensive inner conflicts, self-observation, self-evaluation, and existential anxieties). It is proposed that this level of development describes the behavior of middle adolescents. The process of differentiation of the mental structure is global and influences a whole mental structure. Differentiation leads to chaos and to the growth of entropy (Bertuglia & Vaio, 2005). The chaotic behavior of this level is a result of nonlinear and recursive interactions between different dynamisms. Developmental dynamisms are the product of the five forms of overexcitability that undergo extensive differentiation in the course of development. The strength of overexcitabilities contributes to the developmental potential and *“can be viewed as a channel through which information flow in the form of sensations, feelings, experiences, images, ideas, hopes, and desires... These channels can be wide open, narrow, or operating at bare minimum. They assume to be part of a person’s constitution and to be more or less independent of each other. If more than one of these channels have wide apertures, then the abundance and diversity of feeling, thought, imagery, and sensation will inevitably lead to dissonance, conflict, and tension ”* (Piechowski, 1999, p. 327). These inner tensions and conflicts create a far from equilibrium state and the rapid flow of energy (information) links components of mental structure into coherent, higher-order forms. Prigogine and Stengers wrote: *“at equilibrium molecules behave as essentially independent entities; they ignore one another... However, non-equilibrium wakes them up and introduces a coherence quite foreign to equilibrium* (Prigogine & Stengers, 1984; p. 181). These higher-order arrangements are developmental dynamisms and through them, the abrupt changes in human behavior can be observed. Developmental dynamisms (astonishment with oneself, disquietude with oneself, dissatisfaction with oneself, feeling of inferiority and guilt) act as loops of positive

feedback, pushing mental structure further into a chaotic state and creating instability. This instability becomes strong enough to shatter pre-existing organization. “*The instability and partial or even complete, disorganization of behaviour is necessary in the process of development from a lower to higher level of mental functioning*” (Dabrowski, 1996, p.11). This level can be described by a *chaotic attractor*.

The Dynamisms of the Spontaneous Multilevel Disintegration

In this section, the developmental dynamisms of the level of spontaneous multilevel disintegration are introduced. They are divided into three groups: the self emotions, the self-conscious emotions, and positive maladjustment. The quotes in this section are taken from the diary of a seventeen old girl (Troszkiewicz, 1966).

The Self Emotions

The first phase of spontaneous multilevel disintegration is characterized by emotional-cognitive dynamisms: *astonishment with oneself* – the first phase in the authentic observation of oneself and beginning of the desire to change (“I don’t know what is going on with me...”), *disquietude with oneself* – search of the meaning of one’s behaviour and existence, growing attitude of self-criticism with emotional tension and readiness toward inner psychic transformation (“I know that, whatever it is, it is not good.”), *dissatisfaction with oneself* – critical, condemning attitude toward oneself accompanied by states of anxiety and depression (“I don’t know how to clearly formulate my thoughts or maybe I don’t have my own thoughts”), and *feeling of inferiority toward oneself* – the awareness of the possibility of development, the awareness of weakness and, at the same time, the feeling of one’s potential and strength (“My great desire is to be able to express myself and deepen my knowledge.”).

These dynamisms create states of self-observation, self-reflection, self-awakening, self-criticism, and self-awareness. The dynamisms of the first phase of multilevel disintegration are primarily the product of emotional overexcitability, and the intellectual overexcitability enhances the development of self-awareness (Dabrowski, 1996).

The Self-Conscious Emotions

A further emotional – cognitive development creates a new class of emotions called: self-conscious emotions. They appear in the second phase of spontaneous multilevel disintegration. Self-conscious emotions include embarrassment, shame, guilt, and pride. These emotions require the ability to evaluate one's self and to infer the mental states of others (Dabrowski, 1996; Damasio, 2003; Decety & Sommerville, 2003). Self-conscious emotions are important for helping individuals recognize and correct their social mistakes, strengthen social bonds, renew commitment to relationships, and motivate positive behavior (Tangney, et al., 1996). They provide internal feedback about a specific goal, expectation, or standard that has been violated. Violations of social conventions may result in embarrassment. Violations of character ideals are associated with shame. Violations of rules, related to harm, justice, and rights relate to guilt (Keltner & Buswell, 1997).

Positive Maladjustment

In the third phase of spontaneous multilevel disintegration, *positive maladjustment* emerges. This is a dynamism of a conscious and selective rejection, a need for adaptation to higher hierarchy of value, and a lack of adjustment to certain external or internal conditions. It expresses the drive toward accelerated development, self-perfection, and realization of the attitude of autonomy and authenticity (Dabrowski, 1973). The positive maladjustment is a starting point for transition to the next level of development (Laycraft, 2009). Middle adolescents

have well-developed emotional systems but the cognitive systems are still developing. While the emotional functions acting as a positive feedback are stronger than cognitive functions acting as a negative feedback, the mental structure is in the chaotic state.

Fisher (1980) introduces the concept of “abstract mapping” to explain the cognitive ability of middle adolescents to make differentiation between single self-representation. The adolescent can now “map” constructs about the self onto one another, but cannot yet integrate such self-representations in a way that would resolve obvious inconsistencies. The awareness of these opposites produces internal conflict, confusion, uncertainty about which characteristic to adopt (Harter, 1999).

The self-discrepancy theory developed by Higgins (1987, 1989) illustrates well an emotional and psychological turmoil of adolescents. This theory differentiates between domains of self-representation (i.e., the actual self; the ought self, and the ideal self) and inferred perspectives on the self (i.e., own perspective; parental perspective; partner perspective). The experience of discrepancy between the actual-self and the ought self or the ideal self, provokes emotional distress and the desire to reduce discrepancy. Kegan’s (1994) suggests that the period of adolescence is a period in need of support for gradual evolution of mind from the second to the third order of consciousness. The adolescents begin to think abstractly, to understand the needs of other people, and experience of self-reflexive emotions.

The Organized Multilevel Disintegration

The fourth level - *organized multilevel disintegration* is a further expansion of the spontaneous multilevel disintegration and there is some overlap between these two levels. The characteristic feature of this level is conscious transformation of oneself and synthesis that leads to increasing stabilization of the hierarchy of value. There are existential, philosophical, and

transcendental conflicts. Behavior changes towards self-perfection and emotional relationships become deep and enduring (Dabrowski, 1996; Dabrowski et al., 1970; Dabrowski & Piechowski, 1977). This level of development characterized by lesser tension and greater ability to systemize experiences, describes behavior of older adolescents and young adults. They focus on own future and personal goals. Often during late adolescence and early adulthood individuals choose an interest that will later be the central theme of their lives. This level is characterized by openness to external experiences, sensitivity, and identification with others. It can be compared to “dissipative structures,” which maintain their existence by interaction with their environment and maintaining the flow of energy into and out of the system (Prigogine, 1980, 1997; Prigogine & Stengers, 1984). Mental structure transforms itself into a new ordered state of increased complexity and therefore stability. An emerging order (dissipative structure) is characterized by a “symmetry-breaking” process (break of the symmetry between past and future) (Prigogine, 1980).

”This gives rise to a personal, subjective transformation of time, parallel and interwoven with the objective temporal realm. Needless to say, a symmetry-breaking process unfolds a new space-time dimension that affects the reorganization of selfhood processes and make available new knowledge abilities and experience domains” (Guidano, 1987, p. 68)

The Dynamisms of the Organized Multilevel Disintegration

The dynamisms of the organized multilevel disintegration work much closer together and act as negative feedback to stabilize and organize a mental structure. The main dynamisms are: “*subject-object*” in *oneself* - critical self-observation, self-evaluation, and conscious need for development, working closely with the dynamism of inner psychic transformation (“Suddenly, I

realize that knowing myself is a great delight. Since I struggle for myself and realize my dream, I become friend with myself.”), *the third factor* – represents the autonomous forces of self-directed development and conscious choice in development (“...Fortunately, some years have passed and I have changed, calmed down and found my own path...”), *self-awareness* – awareness of one’s identity and of one’s individual uniqueness (“I begin to enjoy being a woman.”), *self-control* – bringing order and unity into one’s development, increasing calmness and confidence, *creative dynamism* – an outlet for the increased tension of inner conflict (“A writing diary helped me a lot. I couldn’t imagine without writing.”), and *empathy* (Dabrowski, 1996; Dabrowski & Piechowski, 1977).

During the period of older adolescence and early adulthood, the individual can integrate potentially opposing attributes into higher-order abstractions. Such higher-order abstractions bring meaning and authenticity to what in earlier times appeared to be upsetting contradictions within the self (Harter, 1999). Higher levels of emotional and emotional-cognitive functions produce greater psychic complexity, higher levels of creativity, self-awareness, empathy, and social responsibility. They interconnect and reciprocally advance the level of the other functions. For example, the key factors of empathy are: (1) “subject-object” in oneself – perceiving others as subject, (2) self-awareness, (3) the third factor – conscious choices, and (4) self-control. They intertwined and interact with one another to produce the dynamism of empathy (Dabrowski, 1996). The description of this level finds its counterpart in Kegan’s (1994) the third consciousness corresponding to interpersonal and institutional self stages, and describes a sense of self which is aware of both self and others as independent needful beings, is able to construct of long-range plans, and to make life choices and decisions.

THE ADOLESCENT BRAIN DEVELOPMENT

In this section, the latest research about brain development in adolescence is reviewed. In particular, it is paid attention to the changes in the limbic and cortical systems. They are responsible for integrating the cognitive and emotional components of psychological functioning. The limbic system mediates emotional states that orient attention and action to whatever is meaningful. The key structure of limbic system is amygdala that links the neural stimuli with emotional content. There are two cortical systems: the anterior cingulate cortex (ACC) and the orbitofrontal cortex (OFC) that serve as interface between the prefrontal cortex and limbic system. They mediate cognitive activities relevant to emotional states. The prefrontal cortex (PFC) appears to be critical for mature decision-making and cognitive control emotional responses (emotional regulation).

New imaging techniques and especially magnetic resonance imaging (MRI) have made an enormous leap into the studies of adolescent brain. The MRI studies have shown that during adolescence, a brain is in a dynamic state. A brain of an early adolescent is different in anatomy, biochemistry, and physiology than a brain of a late adolescent. The teen brain has an enormous neural plasticity and undergoes disorganization and reorganization for almost a decade (Spear, 2000). Gray matter in the frontal lobe increases during pre-adolescence with maximum size occurring at 12.1 years for males and 11.0 years for females and temporal lobe cortical gray matter peaks at 16.7 years in girls and 16.2 years in boys. The process of proliferation is followed by pruning, a cutting back of inefficient or ineffective synaptic connections to achieve maximal efficiency of function during the adolescence period (Giedd et al., 1999; Sowell et al., 1999, 2001, 2002).

Gogtay and his colleagues (2004) based on the longitudinal studies report the dynamic sequence of human cortical gray matter development from childhood to young adulthood. They show that the gray matter (GM) volume increases at earlier ages, followed by sustained loss starting around puberty. The process of GM loss begins first in dorsal parietal cortices, and then spreads over the frontal cortex, the parietal, occipital, and finally the temporal cortex. The loss of GM in the dorsolateral prefrontal cortex appears at the end of adolescence.

Parallel to the process of pruning, MRI studies show a steady increase in white matter, *myelination* in the frontal, parietal, and temporal cortices throughout adolescence (Giedd, 2004; Sowell et al., 2002; Luna & Sweeney, 2004). The myelination during adolescence, contributes to development of executive functions of the brain, including faster information processing, by facilitating the integration of distributed brain areas and enhancing local connections (Luna & Sweeney, 2004, Benes, et al., 1994; Thompson et al., 2000).

The period of proliferation, pruning and myelination is an extremely important period for the self-organization of the adolescent brain. The adolescents through their activities are able to self-organize the neuronal connections in their brains.

Brain of Early Adolescents

During early adolescence, the cognitive processes that underline the ability to inhibit inappropriate behaviors and abstract thinking are evolving. Behavior of young teens can be described by *low-road (short route)* processing. The external stimuli reach the amygdala by way of direct pathways from thalamus. This path is short and fast transmission but unfiltered and biased toward evoking responses (LeDoux, 2002). This processing leaves the individual in a state of intense emotions, impulse reactions, rigid and repetitive responses, and lacking in self-reflection. This is similar to the unilevel disintegration period described in the previous chapter.

Brain of Middle Adolescents

The middle adolescence period is characterized by the processes of pruning and myelination, which introduce natural changes in the synaptic configuration in the limbic and cortex structure of the adolescent brain. As a result of these changes, the individual experiences a variety of emotions. Consequently, emotions introduce changes in individual's behavior and influence his or her development. The first phase of spontaneous multilevel disintegration is characterized by emotional-cognitive dynamisms, which create states of self-observation, self-reflection, self-awakening, self-criticism, and self-awareness.

A variety of neurological studies have shown that an experience of self-awareness activates the anterior cingulate cortex (the ACC) on the medial surface of the brain (Botvinick et al., 2001; Eisenberger et al., 2003; Lou et al., 2004). The ACC is also involved in self-reflection (Johnson, et al., 2002), in first-persons reports of mental states like emotions, self-generated thoughts, and intentions to speak (Cabeza & Nyberg, 2000), in self-referential mental activity (Gusnard, et al., 2001), and in the autobiographical self (Damasio, 1999).

Based on this research, it is suggested that when the ACC starts to mature, and the connections between amygdala and the anterior cingulate cortex increases, a stimulus that might earlier have initiated an automatic behavioral routine comes to be treated with a more reasoned, reflective, and deliberated response. The ACC is a part of a circuit involved in a form of attention that serves to regulate both cognitive and emotional processing (See Figure 2).

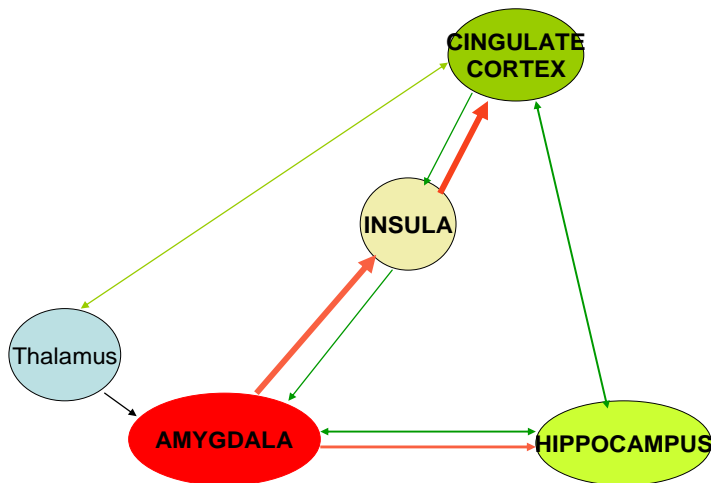


Figure 2

Next, the self-conscious emotions appear. These emotions arise from the awareness that other people have selves and therefore, neural systems expressing the self-conscious emotions have to include other's people existence. Both lesion and imaging research suggest that prefrontal cortex, especially the orbitofrontal cortex (OFC), the temporal lobes, and amygdala are involved in understanding other people's mental and emotional states. For example, embarrassment has been mainly associated with the orbitofrontal cortex and temporal lobes (Beer et al., 2003, 2006; Takahashi et al., 2004). The OFC located behind and above the eye orbits is involved in the regulation of social behavior, in critical human functions, such as social adjustment and control mood, drive and responsibility. The OFC is richly connected with the anterior cingulate and with the areas associated with emotional and social processing, including amygdala and hippocampus (Adolphs, 1999, 2003; LeDoux, 2002) and appears to play a crucial role in the human capacity to sense other people, to understand the interpersonal interactions

(Siegel & Hartzell, 2003), and to be involved in the working memory about emotional information (Bechara, et al., 2000; Damasio, 1999, 2003). The temporal lobes matures late in adolescence and have been associated with making inferences about the minds of others and knowledge about the social world (See Figure 3).

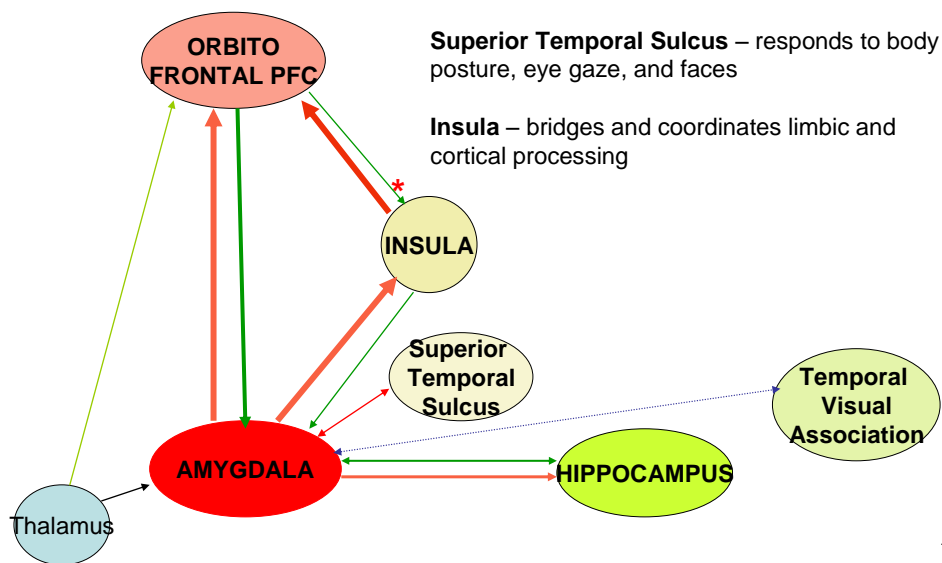


Figure 3

And at last, positive maladjustment appears when the dorso-lateral prefrontal cortex matures (Gogtay et al., 2004) and connects with the anterior cingulate region and orbito-frontal cortex and through them with amygdala.

Joseph LeDoux (2002) explains that conscious experiences of an emotion appear when amygdala connects with working memory circuits. Although, the amygdala does not have direct connection with the dorso-lateral prefrontal cortex, it does have connections with the anterior cingulate cortex and orbito-frontal cortex. The connections within and between these three regions establish circuits that highlight the integrative functions of working memory. Positive

maladjustment requires a strong knowledge of the self, developed social emotions, ability to compare oneself with others, ability for judgment, for making decisions, and sensitivity to feedback (See Figure 4).

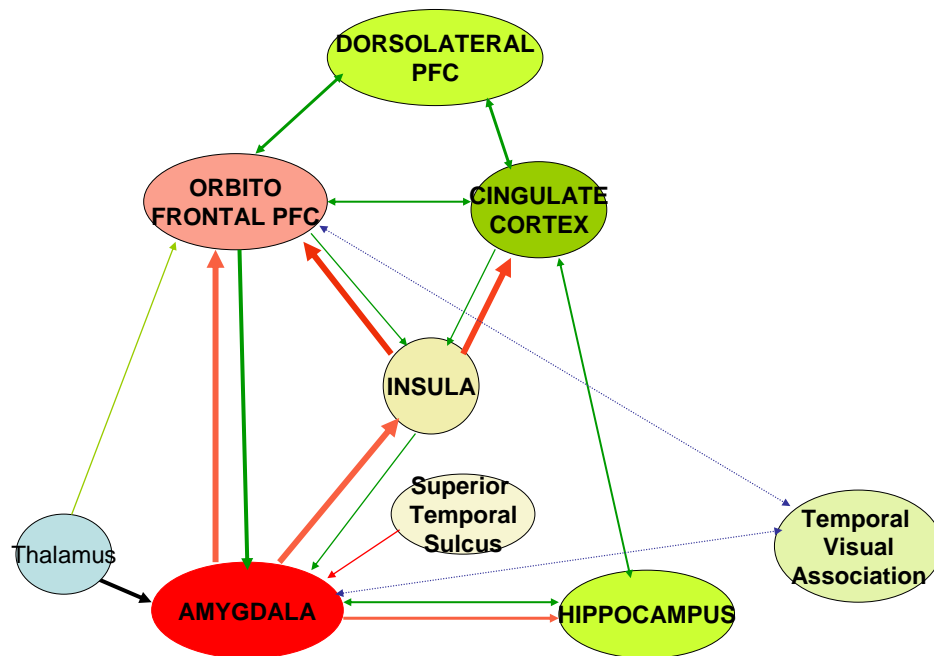


Figure 4

What seems to emerge during the transition from middle to late adolescence is a newly, more balanced integrated system of cognitive activity, a system that is increasingly under conscious control.

Brain of Late Adolescents

During late adolescence and early adulthood, the brain continues to change. These developmental brain changes represent a process of selection and reorganization of neural networks with a goal of faster and more efficient information processing, which leads to increased integration among cortical areas and between cortical and subcortical structures

(Cozolino, 2006). These connections evolve and stabilize based on the activities of the neurons themselves. Learning, positive experiences, and the formation of memories play major roles in the building up of connections (LeDoux, 2002; Siegel, 1999). Hence, cortical development truly is self-organizing (Lewis, 2005). The set of autonomous factors, introduced by Dabrowski (1996), represents this process. This is the agent of conscious choice and decision in personal growth and transformational forces, which due to empathy, memory, imagination, and retrospection allow an individual to self-organize (Dabrowski et al., 1970).

Recent studies from a social-neuroscience perspective (Decety & Lamb, 2006; Decety & Jackson, 2006; Decety & Moriguchi, 2007) show that empathy is a complex phenomena emerging from the flow and integration of information between specific brain circuits. The major functional components dynamically interacting with each other produce the experience of empathy: (1) emotion sharing between the self and the other, based on the automatic perception-action coupling, (2) self-awareness, (3) a cognitive capacity to take the perspective of the other person, and (4) self-control and emotion regulation (See Figure 5).

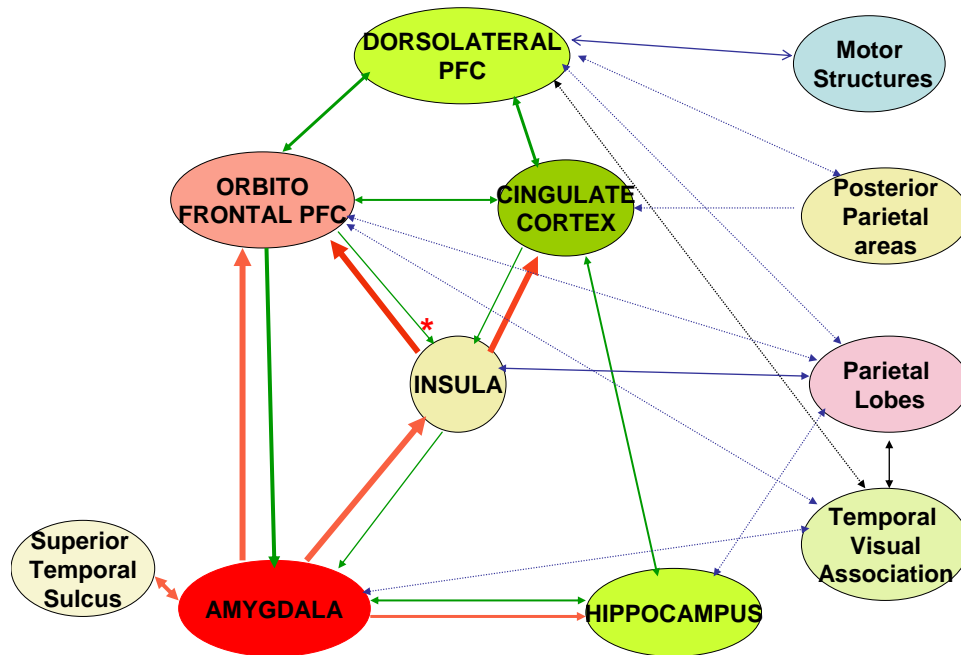


Figure 5

During this period of late adolescence and young adulthood, the neural connections to cortex start to build up and more often the information about external stimuli goes from thalamus to the cortex and to the amygdala. This is *the high (long) road* processing, which allows for mindfulness, flexibility in our responses, and an integrating sense of self-awareness. This form of processing involves the higher, rational, and reflective thoughts (Siegel & Hartzell, 2004; Le Doux, 1996). Creation of the self, social regulation, planning for the future, maturity of judgment, decision making, the ability to integrate cognition and emotion are important skills that rely on numerous interconnecting cognitive components that emerge as the brain develops during late adolescence.

The period of adolescence may be understood as a transition from the differentiated and local to the integrated and distributed organization of brain functioning.

FUTURE RESEARCH

Future research should explore further connections between the concepts of theory of positive disintegration (the developmental potential, overexcitability, developmental dynamisms) with neurodevelopmental studies. This research should include the longitudinal study of brain structure of gifted (talented or creative) and non-gifted people along with the OE measurements and a variety of qualitative studies (interviews, biographies, and diaries).

Additional research can be done that combines the phase transitions in Dabrowski's theory and catastrophe theoretical approach. We expect that catastrophe detection and modeling will lead to more definite tests of the phase transitions between the levels of positive disintegration.

CONCLUSION

This article is intended for psychologists, educators, and parents, particularly those interested in psychological development of young people. It is the first attempt to link the theory of positive disintegration with theory of self-organization and neuroscience. It appears important to integrate these areas of study, to achieve a better understanding of the complex process of adolescent development. It is demonstrated that the theory of positive disintegration combined with the main principles of self-organization describes and explains the internal processes of adolescent development. The unilevel disintegration and the spontaneous multilevel disintegration are an outcome of dynamic and dramatic changes in the adolescent brain. They are normal and crucial periods of adolescent development. They represent a far-from-equilibrium state that is a necessary condition for self-organization into more complex and ordered states of mental structure of young people. Through this process, young people become active agents in their development, responsible for their lives, and are able to channel their tension "upward" through developmental dynamisms of higher levels.

The main goal of this study is to show that *psychological development through the positive disintegration* is the best way for the protective and prophylaxis against mental “disorder” of adolescents. Through the process of positive disintegration, adolescents gain the capacity to differentiate and then to integrate their own distinct inner experiences. That allows them to achieve the internal dynamic order and find the direction for their future’s goals and plans.

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