

Positive Maladjustment as a Transition From Chaos to Order

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Dabrowski's theory of positive disintegration describes patterns and explains mechanisms of human development and has been successfully applied to understanding of gifted individuals. This article shows 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. This article introduces 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).

During the early 1980s I worked as a physicist on some non-linear 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 young 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. (F. D. 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, Kawczaki, & Piechowski, 1970).

The theory of positive disintegration 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. 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

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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 lower levels” (Dabrowski, 1972, p. 219) by activating the process of development to the more complex, richer and higher levels. 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).

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 aesthetics. Multilevel development consists not only in 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).

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: (a) primary integration, (b) unilevel disintegration, (c) spontaneous multilevel disintegration, (d) organized multilevel disintegration, and (e) 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, that are acted upon by the very strong positive influence of a highly complex environment (Dabrowski, 1996; Dabrowski et al., 1970).

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, 1996; Dabrowski et al., 1970).

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, 1996; Dabrowski et al., 1970).

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 autopsychotherapy. There are existential, philosophical, and transcendental conflicts. Behavior changes toward self-perfection and emotional relationships become deep and enduring (Dabrowski, 1996; Dabrowski et al., 1970).

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, 1996; Dabrowski et al., 1970).

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 that 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 that 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 demonstrated 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; Mendaglio & Tillier, 2006; Piechowski, 1986, 2006).

The intellectual, imaginal, and emotional overexcitability 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 that 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” (p. 159). 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 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).

Developmental dynamisms are similar to Lewis and Granic’s (1999) emotional interpretations (EIs) and Izard’s (1984) affective-cognitive structures. Both constructs describe 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, p. XI). 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, p. XI).

In the last 30 years, new ways of study and understanding complex systems have emerged called *chaos theory*. Chaos theory is used as a conceptual umbrella for various approaches to, and explorations of, nonlinear, interdependent, and dynamical systems. Common examples are dynamical system theory (F. D. Abraham, R. H. Abraham, & Shaw, 1990; Thelen & Smith, 1994), self-organization (Maturana & Varela, 1992), theory of nonequilibrium phase transition (Haken, 1984, 1987), neural nets (Levine, 1991, 1995; Levine, Leven, & Prueitt, 1992), fractals (Lauwerier, 1991; Mandelbrot, 1982), catastrophe theory (Arnold, 1986; Thom, 1972/1975; Zeeman, 1977), 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 (Briggs & Peat, 1990, 1999; Butz, Chamberlain, & McCown, 1997; Freeman, 2000; Kelso, 1995; Lorenz, 1993).

FEEDBACK AND 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 (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; 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 preexisting 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 (F. D. Abraham, 1995b).

Here are some examples of psychological bifurcation points (Gilgen, 1995): (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).

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* (R. H. 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* (R. H. 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* (R. H. Abraham & Shaw, 1984; Briggs & Peat, 1990). It is a complex cycle that 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* (Gleick, 1988; Kelso, 1995; Lorenz, 1993) 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 (F. D. Abraham, 1995b; Lewis, 1997, 2000, 2005; Lewis & Granic, 1999) 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 nonlinear 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 (1984) show that nonequilibrium is a source of order. They write: “at equilibrium molecules behave as essentially independent entities; they ignore one another. . . . However, nonequilibrium wakes them up and introduces a coherence quite foreign to equilibrium” (pp. 180–181).

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

Transition from Order to Chaos

In this section, 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 worlds. 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 factors, 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 favorable 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, might 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). This means that the control parameter changes to the second factor and external influences begin to operate.

This transformation can be modeled 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 (F. D. Abraham, 1995b; Kelso, 1995).

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 behavior of this level is a result of a complex cooperation between different dynamisms. Developmental dynamisms (astonishment toward 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 behavior. 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 modeled by a subtle bifurcation when a periodic attractor changes into a chaotic attractor as a control parameter is varied (F. D. Abraham, 1995b).

We observe here (see Figure 1) 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).

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 behavior, 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 nonlinear equations in a dynamical model may lead to chaotic solutions.

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'" (p. 65).

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 behavioral 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 (Kelso, 1995; Nicolis & Prigogine, 1989; 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, p. 125).

Self-organization mainly refers to control of a system from within the system by acting upon its control parameters (F. D. 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 16-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 Jaworzakowa. 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, p. 1)

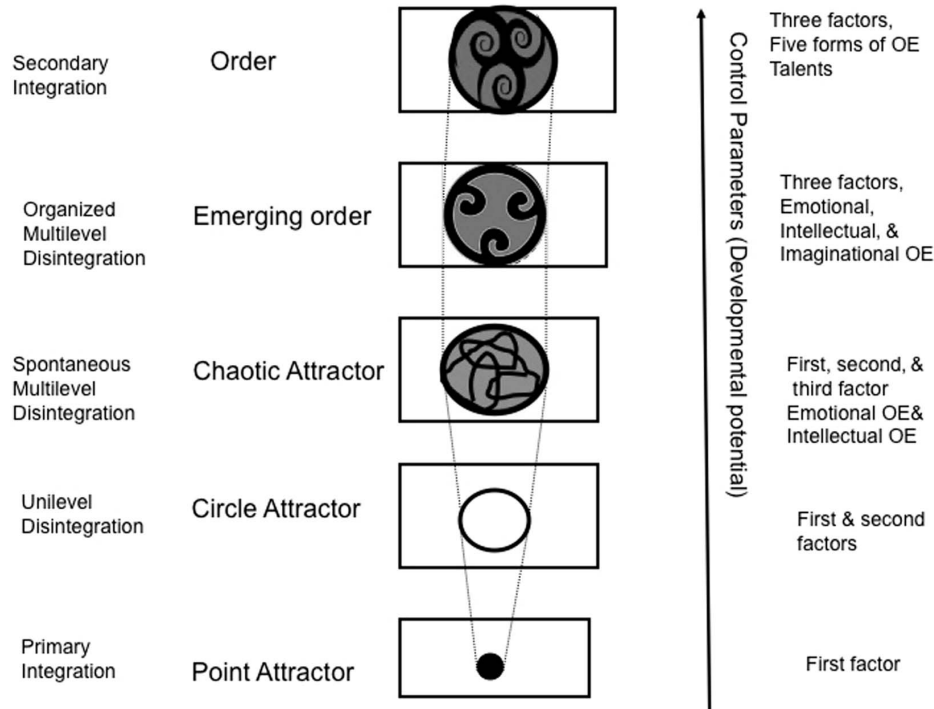


FIGURE 1 Transition from order to chaos and from chaos to order.

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 behavior. 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 (Keltner & Buswell, 1997; Tangney, Miller, Flicker, & Barlow, 1996).

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 these horrible moments. . . . (Troszkiewicz, 1966, p. 30)

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 17-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, p. 51)

According to Dabrowski's theory, development of young gifted people is impossible without transition through "chaotic"

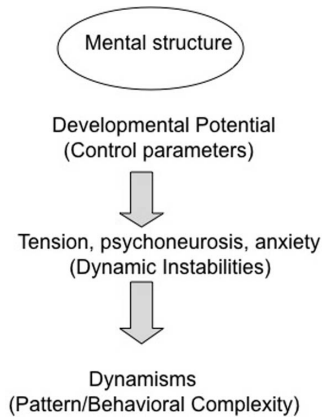


FIGURE 2 Matter complexity to behavioral complexity through instabilities.

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).

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 (Edelman, 2004; Edelman & Tononi, 2000; Siegel, 1999).

In summary, 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 (Izard, 1984; Izard, Ackerman, Schoff, & Fine, 2000; Lewis, 1997, 2000; Lewis & Ferrari, 2001; 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 behaviors 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, I introduced 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), that 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, I 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.

REFERENCES

- Abraham, F. D. (1995a). The Leibniz-Abraham correspondence. In F. D. Abraham & A. R. Gilden (Eds.), *Chaos theory in psychology* (pp. XIX-XXVIII). Westport, CT: Greenwood Press.

- Abraham, F. D. (1995b). Introduction to dynamics: A basic language; a basic metamodeling strategy. In F. D. Abraham & A. R. Gildea (Eds.), *Chaos theory in psychology* (pp. 31–49). Westport, CT: Greenwood Press.
- Abraham, F. D., Abraham, R. H., & Shaw, C. D. (1990). *A visual introduction to dynamical systems theory for psychology*. Santa Cruz, CA: Aerial Press.
- Abraham, R. H., & Shaw, C. D. (1984). *Dynamics—The geometry of behavior*. Santa Cruz, CA: Aerial Press.
- Arnold, V. I. (1986). *Catastrophe theory*. Berlin: Springer-Verlag.
- Briggs, J., & Peat, F. D. (1990). *Turbulent mirror*. New York: Harper Collins Perennial Library.
- Briggs, J., & Peat, F. D. (1999). *Seven life lessons of chaos*. New York: Harper Collins Publishers.
- Butz, M. R., Chamberlain, L. L., & McCown, W. G. (1997). *Strange attractors, chaos, complexity, and the art of family therapy*. New York: John Wiley & Sons.
- Dabrowski, K. (1937). Psychological bases of self-mutilation. *Genetic Psychology Monograph*, 19, 1–104.
- Dabrowski, K. (1964). *Positive disintegration*. Boston: Little, Brown.
- Dabrowski, K. (1967). *Personality shaping through positive disintegration*. Boston: Little, Brown.
- Dabrowski, K. (1972). *Psychoneurosis is not an illness*. London: Gryf.
- Dabrowski, K. (1973). *The dynamics of concepts*. London: Gryf.
- Dabrowski, K. (1976). On the philosophy of development through positive disintegration and secondary integration. *Dialectic and Humanism*, 3–4, 131–144.
- Dabrowski, K. (1996). *Multilevelness of emotional and instinctive functions*. Lublin, Poland: Towarzystwo Naukowe Katolickiego Uniwersytetu Lubelskiego.
- Dabrowski, K., Kawczak, A., & Piechowski, M. (1970). *Mental growth through positive disintegration*. London: Gryf.
- Dimitrov, V. (2004). *Complexity of human life*. Retrieved January 4, 2009, from <http://www.zulenet.com/VladimirDimitrov/pages/complexity1.html>
- Dodge, K. A. (1991). Emotion and social information processing. In J. Garber & K. A. Dodge (Eds.), *The development of emotion regulation and dysregulation* (pp. 159–181). Cambridge, UK: Cambridge University Press.
- Edelman, G. M. (2004). *Wider than the sky*. New Haven, CT: Yale University Press.
- Edelman, G. M., & Tononi, G. (2000). *A universe of consciousness*. New York: Basic Books.
- Freeman, W. J. (2000). *How brain make up their minds*. New York: Columbia University Press.
- Gilgen, A. R. (1995). A search for bifurcations in the psychological domain. In F. D. Abraham & A. R. Gilgen (Eds.), *Chaos theory in psychology* (pp. 139–144). Westport, CT: Praeger.
- Gleick, J. (1988). *Chaos, making a new science*. New York: Penguin.
- Haken, H. (1984). *The science of structure synergetics*. New York: Van Nostrand Reinhold.
- Haken, H. (1987). Synergetics: An approach to self-organization. In F. E. Yates (Ed.), *Self-organizing systems: The emergence of order* (pp. 417–434). New York: Plenum.
- Izard, C. E. (1984). Emotion-cognition relationships and human development. In C. E. Izard, J. Kagan, & R. B. Zajonc (Eds.), *Emotions, cognition and behavior* (pp. 17–37). Cambridge, UK: Cambridge University Press.
- Izard, C. E., Ackerman, B. P., Schoff, K. M., & Fine, S. E. (2000). Self-organization of discrete emotions, emotion patterns, and emotion-cognitive relations. In M. D. Lewis & I. Granic (Eds.), *Emotion, development, and self-organization* (pp. 15–36). Cambridge, UK: Cambridge University Press.
- Kelso, J. A. S. (1995). *Dynamic patterns, the self-organization of brain and behavior*. Cambridge, MA: MIT Press.
- Keltner, D., & Buswell, B. N. (1997). Embarrassment: Its distinct form and appeasement functions. *Psychological Bulletin*, 122, 250–270.
- Lauwerier, H. (1991). *Fractals, endlessly repeated geometrical figures*. Princeton, NJ: Princeton University Press.
- Levine, D. S. (1991). *Introduction to neural and cognitive modeling*. Hillsdale, NJ: Lawrence Erlbaum.
- Levine, D. S. (1995). *Common sense and common nonsense*. New York: Oxford University Press.
- Levine, D. S., Leven, S. J., & Prueitt, P. S. (1992). Integration, disintegration, and the frontal lobes. In D. S. Levine & S. J. Leven (Eds.), *Motivation, emotion, and goal direction in neural networks* (pp. 301–335). Hillsdale, NJ: Lawrence Erlbaum.
- Lewis, M. D. (1997). Personality self-organization: Cascading constraints on cognition-emotion interaction. In A. Fogel, M. C. Lyra, & J. Valsiner (Eds.), *Dynamics and indeterminism in developmental and social processes* (pp. 193–216). Hillsdale, NJ: Lawrence Erlbaum.
- Lewis, M. D. (2000). Emotional self-organization at three time scales. In M. D. Lewis & I. Granic (Eds.), *Emotion, development, and self-organization* (pp. 37–69). Cambridge, UK: Cambridge University Press.
- Lewis, M. D. (2005). Self-organizing individual differences in brain development. *Developmental Reviews*, 25, 252–277.
- Lewis, M. D., & Ferrari, M. (2001). Cognitive-emotional self-organization in personality development and personal identity. In H. A. Bosma & E. S. Kunen (Eds.), *Identity and emotion, development through self-organization* (pp. 177–198). Cambridge, UK: Cambridge University Press.
- Lewis, M. D., & Granic, I. (1999). Self-organization of cognition-emotion interactions. In T. Dalgleish & M. Power (Eds.), *Handbook of cognition and emotion* (pp. 683–701). Chichester, England: Wiley.
- Li, T.-Y., & Yorke, J. A. (1975). Period three implies chaos. *American Mathematical Monthly*, 82, 985–992.
- Lorenz, E. N. (1993). *The essence of chaos*. Seattle: University of Washington Press.
- Magai, C., & Nusbaum, B. (1996). Personality change in adulthood: Dynamic systems, emotions, and the transformed self. In C. Magai & S. H. McFadden (Eds.), *Handbook of emotion, adult development, and aging* (pp. 403–420). New York: Wiley.
- Mandelbrot, B. B. (1982). *The fractal geometry of nature*. New York: W.H. Freeman.
- Martens, W. H. J. (2003). Emotional capacities and sensitivity in psychopaths. *Dynamical Psychology*. Retrieved January 4, 2009, from <http://www.goertzel.org/dynapsyc/2003/psychopaths.htm>
- Maturana, H. R., & Varela, F. J. (1992). *The tree of knowledge: The biological roots of human understanding*. Boston: Shambhala.
- May, R. (1976). Simple mathematical models with very complicated dynamics. *Nature*, 261, 459.
- Mendaglio, S., & Tillier, W. (2006). Dabrowski's theory of positive disintegration and giftedness: Overexcitability research finding. *Journal for the Education of the Gifted*, 30(1), 68–87.
- Nicolis, G., & Prigogine, I. (1989). *Exploring complexity*. New York: W. H. Freeman.
- Piechowski, M. (1975). A theoretical and empirical approach to the study of development. *Genetic Psychology Monograph*, 92, 231–297.
- Piechowski, M. (1986). The concept of developmental potential. *Roeper Review*, 8, 190–197.
- Piechowski, M. (2006). *Mellow out, they say. If I only could. Intensities and sensitivities of the young and bright*. Madison, WI: Yunasa Books.
- Prigogine, I. (1980). *From being to becoming, time and complexity in the physical science*. San Francisco: W. H. Freeman.
- Prigogine, I. (1997). *The end of certainty*. New York: The Free Press.
- Prigogine, I., & Stengers, I. (1984). *Order out of chaos*. Toronto, Ontario, Canada: Bantam.
- Siegel, D. J. (1999). *The developing mind*. New York: Guilford.
- Siegel, D. J., & Hartzell, M. (2004). *Parenting from the inside out*. New York: Tarcher/Penguin.
- Tangney, J. P., Miller, R. S., Flicker, L., & Barlow, D. H. (1996). Are shame, guilt, and embarrassment distinct emotions? *Journal of Personality and Social Psychology*, 70, 1256–1269.
- Thelen, E., & Smith, L. B. (1994). *A dynamic systems approach to the development of cognition and action*. Cambridge, MA: Bradford/MIT Press.

Thom, R. (1975). *Structural stability and morphogenesis*. Reading, MA: W. A. Benjamin. (Original work published 1972)
Tritton, D. J. (1988). *Physical fluid dynamics*. New York: Oxford University Press.

Troszkiewicz, K. (1966). *Diary of seventeen year old girl*. Unpublished manuscript, Warsaw, Poland.
Zeeman, E. C. (1977). *Catastrophe theory and its applications*. Reading, MA: Addison-Wesley.

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