



Overexcitabilities

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Developmental Potential A concept describing innate endowment composed of abilities and talents, intelligence, and overexcitabilities.

Overexcitability An innate tendency to respond with heightened intensity and sensitivity to intellectual, emotional, and other stimuli. Also called psychic overexcitability.

Theory of Positive Disintegration A theory of emotional development from lower to a higher level of psychological functioning, proposed by K. Dabrowski. The core idea of the theory is that structures of a lower level must be dismantled before structures of a higher level can be erected. The theory emphasizes the role of inner conflict, moral sensitivity, compassion, and self-judgment in the personal growth of creative people and spiritual seekers.

OVEREXCITABILITY (OE) is a translation of the Polish term *nadpobudliwość* which means the capacity to be superstimulated. The term *overexcitability*, rather than just *excitability*, was chosen to convey the idea that the stimulation is well beyond the common and average in intensity and duration. Overexcitabilities are assumed to

be innate tendencies that appear in five forms: psychomotor, sensual, intellectual, imaginal, and emotional. The difference in intensity, sensitivity, and acuity is not only greater than normal, it is also a difference in the very quality of experiencing. As enhanced forms of experiencing, overexcitabilities contribute in important ways to the individual's psychological development. Consequently, the strength of overexcitabilities is taken, in part, as a measure of developmental potential.

I. THE CONCEPT OF OVEREXCITABILITY AND ITS ORIGIN

Gifted, talented, and creative people are known to be energetic, enthusiastic, intensely absorbed in their pursuits, endowed with vivid imagination, and strongly sensual, but they are also known to be emotionally vulnerable. Some are known to be aggressive, others to be morally sensitive. They tend to react strongly to aesthetic, intellectual, emotional, sexual, and other stimuli. Because of this intensity, creative people may not always be easy to be with. They are considered deviant—too different to fit the norm. The characteristic of enhanced experiencing is believed to be the property of the nervous systems of creative people. Therefore, overexcitabilities feed, enrich, empower, and amplify

talent. In most cases they appear stronger with higher intelligence, and they are strongest in creative people.

Overexcitabilities are found across all talent domains. Writers, composers, dancers, actors, scientists, inventors, as well as civic and spiritual leaders, all have them. In artists, they are often as strong in adulthood as in childhood. Do they aid or impede development? In the first entry of her *Journal of Solitude*, May Sarton wrote, "I feel too much, sense too much, am exhausted by the reverberations after even the simplest conversation. But the deep collision is and has been with my unregenerate, tormenting, and tormented self." Such great intensity of feeling as well as an inner struggle and self-judgment used to be viewed as mental disturbance. Now they are understood to be essential to inner growth. The sculptor Malvina Hoffman said, "Language is a clumsy medium to express the pounding surge of intense feeling. . . . Music could drive my blood and suffuse my entire being."

We can find similar examples among scientists. Louis Pasteur was deeply emotional, though he did not show it outwardly. He suffered such acute homesickness when he went to study in Paris that his father had to bring him back home. A somewhat different manner of enhanced experiencing was Norbert Wiener's vivid memory of smells and tastes from his childhood trip to Vienna: "The smell of the alcohol lamp over which my parents prepared my sister's warm evening meals, the smell of rich European chocolate with whipped cream, the smell of the hotel and the restaurant and *café*— all these are still sharp in my nostrils." These examples show a rich and amplified range of experiencing. Let us now look at how it came to be explored.

In 1937 the Polish psychologist and psychiatrist Kazimierz Dabrowski published a study titled "Psychological Bases of Self-Mutilation." Examining biographies of creators and clinical cases, Dabrowski identified factors that were predisposing toward physical self-mutilation and psychological self-torment. These predisposing factors are different forms of what he called *psychic overexcitability*. This was the germ of his theory of positive disintegration.

Dabrowski studied how a person responds to stimulation and stress. Emotional tension requires an outlet. When it becomes unbearable it can lead to self-infliction of pain, the pain then brings relief. The pain may be sought in physical self-injury or in emotional

self-torture. The stronger the tension, the stronger the need to release it. Dabrowski saw that people prone to self-mutilation were more susceptible to being excited, tense, thrown off balance by their overstimulation and inner turmoil. In other words, they were high strung and subject to nervousness. He also noticed that they tended to have a rich inner life. He studied clinical cases of gifted and talented youngsters, and biographies of such creators as Michelangelo, Dostoevski, Tolstoy, and Nietzsche. In each case he pointed to clashes of opposing tendencies that created enormous inner tension resulting in various forms of self-torment. The ability to sustain great inner conflicts was to Dabrowski a sign of inner strength because rather than injuring others the person injured himself. He observed that an emotional crisis and mental suffering, so great that it could bring on a psychotic episode, at times resulted in personality integration at a higher level. Personality development toward a higher level through suffering and inner conflict is the leading idea of his theory.

Dabrowski emphasized the disequilibrating, disorganizing, and disintegrating action of overexcitability on many areas of psychological functioning. When this kind of disintegration fosters emotional growth, it is positive, hence the name *theory of positive disintegration*. Overexcitability was defined by the following characteristics: (a) the reaction exceeds the stimulus, (b) the reaction lasts much longer than average, (c) the reaction is often not related to the stimulus, and (d) the emotional experience is promptly relayed to the sympathetic nervous system (accelerated heartbeat, blushing, trembling, perspiring, headaches).

As Dabrowski kept developing his theory, the five overexcitabilities became components of the concept of *developmental potential*. This concept includes overexcitabilities, talents, and intelligence. It is the potential for emotional development to a higher level such as, for example, self-actualization. In fact, Maslow and Dabrowski began a friendship that was cut short by Maslow's premature death in 1970. The overexcitabilities are ways of experiencing with great intensity, aliveness, vividness, depth, and richness in the sensory, intellectual, imaginative, and emotional realms. They are also the means of processing emotional tension.

Each form of overexcitability can be looked on as a mode of being in the world or as a *dimension of mental functioning*. Thus, the *psychomotor* mode is one of move-

ment, restlessness, action, excess of energy seeking an outlet; the *sensual* mode loves surface contact, sensory delight, comfort and hedonism; the *intellectual* mode favors analysis, logic, questioning, the search for truth; the *imaginational* mode celebrates vivid dreams, fantasies, images and metaphors, personifications, strong visualization of experience; the *emotional* mode centers on attachments and affectional bonds with others, empathy, the despair of loneliness, the joy of love, the enigma of existence and human responsibility. The overexcitabilities are modes of personal experience and personal action. Each mode can be viewed as a channel through which information flows in the form of sensations, feelings, experiences, images, ideas, hopes, and desires. The five dimensions are like color filters or interactive channels through which the world is perceived and felt.

The response is specific to the most dominant form, or forms, of overexcitability in a person. For instance, persons characterized by emotional overexcitability when asked what triggers in them the feeling of being incredibly happy may answer that the love of family and friends moves them to tears or that the feeling of oneness with all creation makes them ecstatic. If the answer to the same question is the speed and excitement of water-skiing, playing a hard game of racquet ball, or racing on a motorcycle to feel its roar, it indicates psychomotor overexcitability. In the latter case, although the question was asked in the emotional dimension ("What makes you feel incredibly happy?"), the response came in the psychomotor dimension.

These channels can be wide open, narrow, or operating at bare minimum. They are assumed 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. Consequently, experience becomes multidimensional, enriching, expanding, and intensifying the individual's emotional development. At times the inner tensions and conflicts may be overwhelming.

The five overexcitabilities, plus specific creative gifts, talents, and abilities constitute the original equipment with which a child enters life. Parental, peer, school, historical, economic, and cultural forces all influence how this original equipment will fare.

Today we can say that individual differences, such as heightened versus average excitability, lie in the speed of information processing, in the developmental experiences that stimulate the brain to grow denser and more efficient neural connections, in the extensiveness of cognitive and other networks, and in the excitability and rate of emotional processing by the brain. With current advances in tapping the activity of the living brain, the overexcitabilities could be tested directly by comparing the responses of individuals who score high on a given overexcitability with those who score low.

II. EXPRESSIONS OF OVEREXCITABILITY IN CREATIVE PEOPLE

The following illustrative examples come from biographies and from overexcitability questionnaires obtained from writers, poets, musicians, fine artists, film makers, and dancers-choreographers. Responses marked (π) are from material collected by Jane Piirto for her study of creative writers.

A. Psychomotor Overexcitability

Psychomotor overexcitability describes the surplus of energy characteristic of gifted and creative people as well as the funneling of emotional tension into psychomotor forms of expression. As shown in Table I, the heightened energy of a person can find expression in speaking rapidly, outward gestures of excitement, intense athletic activity, physical work, pressure for action, and strong competitiveness. Emotional tension can be funneled into actions that help discharge it through compulsive talking and chattering, engaging in impulsive actions, displaying nervous habits, working compulsively, or acting out destructively. The higher energy level of creative people is readily noticed, though it is not universal.

Some creators were highly spirited and energetic when they were young but were not so in their adult years. Chopin did not have a strong constitution to begin with and it was later weakened by tuberculosis. Once she returned from boarding school, Emily Dickinson gradually became so agoraphobic and fearful of strangers that she never left her family house. Richard

TABLE I
Forms and Expressions of Overexcitability

<i>Psychomotor</i>	<i>Imaginational</i>
<p><i>Surplus of energy</i> Rapid speech, marked excitation, intense physical activity (e.g., fast games and sports), pressure for action, (e.g., organizing), marked competitiveness</p> <p><i>Psychomotor expression of emotional tension</i> Compulsive talking and chattering, impulsive actions, nervous habits (tics, nail biting), workaholism, acting out</p>	<p><i>Free play of the imagination</i> Frequent use of image and metaphor, facility for invention and fantasy, facility for detailed visualization, poetic and dramatic perception, animistic and magical thinking</p> <p><i>Capacity for living in a world of fantasy</i> Predilection for magic and fairy tales, creation of private worlds, imaginary companions; dramatization</p> <p><i>Spontaneous imagery as an expression of emotional tension</i> Animistic imagery, mixing truth and fiction, elaborate dreams, illusions</p> <p><i>Low tolerance of boredom</i></p>
<i>Sensual</i>	<i>Emotional</i>
<p><i>Enhanced sensory and aesthetic pleasure</i> Seeing, smelling, tasting, touching, hearing, and sex; delight in beautiful objects, sounds of words, music, form, color, balance</p> <p><i>Sensual expression of emotional tension</i> Overeating, sexual overindulgence, buying sprees, wanting to be in the limelight</p>	<p><i>Feelings and emotions intensified</i> Positive feelings, negative feelings, extremes of emotion, complex emotions and feelings, identification with others' feelings, awareness of a whole range of feelings</p> <p><i>Strong somatic expressions</i> Tense stomach, sinking heart, blushing, flushing, pounding heart, sweaty palms</p> <p><i>Strong affective expressions</i> Inhibition (timidity, shyness); enthusiasm, ecstasy, euphoria, pride; strong affective memory; shame; feelings of unreality, fears and anxieties, feelings of guilt, concern with death, depressive and suicidal moods</p> <p><i>Capacity for strong attachments, deep relationships</i> Strong emotional ties and attachments to persons, living things, places; attachments to animals; difficulty adjusting to new environments; compassion, responsiveness to others, sensitivity in relationships; loneliness</p> <p><i>Well-differentiated feelings toward self</i> Inner dialogue and self-judgment</p>
<i>Intellectual</i>	
<p><i>Intensified activity of the mind</i> Thirst for knowledge, curiosity, concentration, capacity for sustained intellectual effort, avid reading; keen observation, detailed visual recall, detailed planning</p> <p><i>Penchant for probing questions and problem solving</i> Search for truth and understanding; forming new concepts; tenacity in problem solving</p> <p><i>Reflective thought</i> Thinking about thinking, love of theory and analysis, preoccupation with logic, moral thinking, introspection (but without self-judgment), conceptual and intuitive integration; independence of thought (sometimes very critical)</p>	

Wagner, Antoine de Saint-Exupéry, Sergei Rachmaninoff, and Thomas Alva Edison are a few examples of the many creators who as children were impetuous, hard-to-control bundles of energy. Today highly spirited gifted children are often mistakenly labeled as hyperactive or having attention deficit/hyperactivity disorder (ADHD).

Saint-Exupéry as a boy was wild and fearless, fond of violent games in which he tyrannized over others. Edison was always getting into scrapes because of his

inquisitiveness. One day, he attached wires to two large cats and then attempted to rub them vigorously to produce static electricity. The scratches and claw marks he got were deep. Rachmaninoff's favorite sport was to jump on and off horse-driven streetcars in motion, even in winter on icy pavement.

In response to the question "How do you act when you get excited?" a poet wrote, "I wave my hands, stumble over my tongue & yak at hyperspeed until my lips are ready to fly off" [7]. A dancer said, "I feel

the most energy in the a.m. Or during or immediately following dancing, I try to 'stay with it,' ride the wave as long as it lasts." The question "What kind of physical activity gives you the most satisfaction?" evoked this response from a young writer/actress, "Swimming but most of all water skiing. It's the most exhilarating sport I've done— the feeling of movement, water and wind against my body all at once." These examples illustrate high energy that finds ways to be discharged physically.

B. Sensual Overexcitability

In sensual overexcitability the pleasures and delights offered through seeing, smelling, tasting, touching, hearing, and sex, as well as multisensory experiences, become enhanced. Persons so endowed immerse themselves in the delight of beautiful things, sounds of nature, sounds of words and music; they note the form, color, and balance in anything around them. Specific aversions to certain tastes, smells, or touch, and the like are also common. Hedonism is often sensual. Sensual pleasure tends to be relaxing and temporarily satisfying.

In contrast, when emotional tension is diverted to the sensual channel it may become excess in eating, smoking, shopping, sex, and a constant desire to be admired. For example, Tchaikovsky began smoking for the pleasure it gave him but soon found that it pacified his high-strung nerves— sensual pleasure combined with a reduction of emotional tension.

Painters smell paint, feel the texture of their material, feel the brush strokes in a painting, just as potters feel the clay being molded in their hands, with heightened sensibility in their whole physical being. Many poets are acutely sensitive to the sound of words and their rhythms, the touch of paper, and the look of print fonts. Musicians are supremely aware of timbres of instruments and the distinct color and timbres of voices, sounds of nature, and of their everyday surroundings (e.g., John Cage).

Chopin's description of Henrietta Sontag's singing— one of the greatest sopranos of the early 19th century— is extremely sensual: "You feel as if she was blowing at you perfumes of the freshest flowers and caressing you with the delicious pleasures of her voice,

but she rarely moves one to tears." Chopin was making a distinction between a purely sensual delight and being deeply moved emotionally. Charles Darwin derived such intense pleasure from listening to music that his "backbone would sometimes shiver."

The vividness of sensory experience and sensory imagination in highly creative people raises an interesting possibility of testing it. Recent reports show that the brain lights up differently when real memories are recalled than when imaginary memories are recalled. In real memories the sensory areas light up, in imagined memories they do not. Because people who have high overexcitability report experiencing their visualizations as real, one would expect their sensory areas to light up during their fantasizing. [See IMAGERY; IMAGINATION.]

C. Intellectual Overexcitability

Intellectual overexcitability encompasses the intensified activity of the mind as thirst for knowledge, curiosity, capacity for concentration and sustained intellectual effort, avid reading and precision in observation, recall, and careful planning. Questioning is the hallmark of intellectual overexcitability as the person is driven by the search for understanding and truth. Perceiving patterns and relationships leads to naming them; thus, new concepts are born. Solving problems, finding it difficult to let go of a problem, and finding new ones to solve is typical. Another trait is reflective thought, exemplified by watching one's own thought processes, delighting in analysis and theoretical thought, preoccupation with logic, moral thinking, introspection, and seeking integration of concepts and intuitions. People strong in intellectual overexcitability are independent thinkers and often highly critical of the thoughts of others. [See METACOGNITION.]

Although one would think that intellectual overexcitability is the prerogative of scientists and philosophers, it is also characteristic of artists and creative people in all domains. The more original an artist's work was judged by experts, the more facility for asking questions the artist had. Habitual or relentless inquisitiveness— pondering and puzzling over things— is one of the distinct characteristics of intellectual overexcitability. The *Allport-Vernon-Lindzey Study of*

Values similarly defines *theoretical value* as an interest in and pursuit of truth, a desire to gain knowledge, systematize it, and bring order to it.

A statement from Darwin illustrates curiosity, concentration, and the thrill of learning a logical principle. Recalling his youth, Darwin said:

I had strong and diversified tastes, much zeal for whatever interested me, and a keen pleasure in understanding any complex subject or thing. I was taught Euclid by a private tutor, and I distinctly remember the intense satisfaction which the clear geometrical proofs gave me. I remember with equal distinctness, the delight which my uncle (the father of Francis Galton) gave me by explaining the principle of the vernier of a barometer.

In his autobiography, *Ex-Prodigy: My Childhood and Youth*, Norbert Wiener stressed that he was motivated by the ideal of service to truth rather than service to humanity even though his father exerted a strong moral influence on him to serve humanity. Wiener also described how when working on a problem “the unresolved ideas were a positive torture to me until I had finally written them down and got them out of my system.” The excerpts from Darwin and Wiener show the crucial involvement of emotion in learning and solving problems.

These examples demonstrate several aspects of intensified activity of the mind that lead to ever more probing questions and search for understanding, shared by scientists and artists alike though their questions and their methods of inquiry may be quite different. They also show a strong emotional component in the process.

D. Imaginational Overexcitability

The role of imagination in creativity has been well documented in many sources. As a personal characteristic, the concept of imaginational overexcitability is broader. It looks at the creator’s underlying predisposition, manifested in childhood, to engage in the free play of the imagination, to fantasize and daydream, but also to come up with unusual associations. To be able

to convert experience into imagery depends on an exceptional ability to see analogies, which are facilitated by unusual associations to emerge as metaphors. When Edison was 10 years old he weighed himself on a scale and said to his mother, “I am a bushel of wheat now, I weigh 80 pounds.” Imagination makes such analogies possible. The impulse to explore new possibilities and to change what is given into something else is ever present; it was delightfully illustrated in the film *Ama-deus*. After hearing a court composer’s piece, Mozart goes to the keyboard to play it and to show how to make it more interesting. All it took was imagination. [See ANALOGIES; METAPHORS.]

Imaginational overexcitability can be also noticed in a person’s facility for visualizing, making elaborate dreams and fantasies, perceiving life experiences poetically and dramatically, and in animistic and magical thinking. Animistic thinking involves endowing inanimate objects with personality, character, and a will of their own. Magical thinking rests on the conviction that to think something is as good as making it happen. The private rituals and formulas to ensure that everything works out all right are examples of such thinking. The capacity for living in a world of fantasy often goes together with the need to spend certain amount of time daydreaming, reading fairy tales and stories, or even creating private imaginary worlds. Having several imaginary companions in childhood, and for some even into adulthood, is a telling sign.

Emotional tension is easily diverted into the theater of imagination where feelings and emotions find their form. It is helpful for understanding one’s emotional life to be able to give an image to what is felt. Words are inadequate and limited, but an image carries the energy and felt quality that reveals the meaning of an experience. For people with overexcitability of imagination, spontaneous imagery is as natural as breathing; dreams are elaborate, illusions and mixing truth and fiction are possible. This does not mean that at other times such persons are not capable of sorting fantasy from reality. On the contrary, for them the difference is quite enhanced. The boundary may blur when intense emotions take over in a rush of vivid images. Frank Lloyd Wright once imagined that his mother was going to give a party for him. He started telling his friends in detail what would be served and how special this oc-

casian was going to be. So they came, all dressed up. Wright's mother was surprised but knowing her son she improvised a party. Because he imagined it, he actually believed the party was going to take place.

Richard Wagner was so fascinated by Beethoven and Shakespeare that he created in his mind a vivid image of each one: "I used to meet them both in ecstatic dreams, saw them, and spoke to them; on awakening I was bathed in tears." His imagination was so graphic that whenever he thought of ghosts he was terrified. When as a boy he visited his relatives who lived in a big house, he was lodged in a stately guest room. The old portraits of young ladies "in hooped petticoats and white powdered hair" seemed to him to be ghosts. Alone in the room he was possessed by terror because they seemed to come to life. Every night of his stay he was drenched with perspiration, a victim to his frightening visions.

Creative people do not tolerate boredom well. They do not enjoy routine and unimaginative exercises. As a boy Rachmaninoff took up improvisation because the music he had to study was too dull for him. He said to his naive listeners that he was playing Chopin or Mendelssohn and no one realized he was playing his own music.

These are just a few examples of the free play of imagination, the capacity for visualization and for fantasy, animistic and magical thinking, and the ability to conjure up novel images and unusual analogies, responses typical of imaginal overexcitability.

E. Emotional Overexcitability

Emotional overexcitability is easily recognized. A person's feelings and emotions are frequently at a higher pitch. The person has a keen awareness and sensitivity to nuances of feeling both in oneself and in others. Because the vehicle for emotion is the body, there are distinctly recognizable psychosomatic signs of overexcitability, such as blushing, getting flushed with color, perspiring, trembling, feeling tension in different parts of the body, feeling hot or cold, and so on. Positive as well as negative feelings are experienced with great intensity, openly by extroverts and inwardly by introverts. We live in a culture in which being emotional is criticized and tampered with. Children are often told

what they should or should not feel rather than accepting what they do feel. When this happens, children with high overexcitability are intensely miserable and confused. Consequently, we have a much higher frequency in emotional individuals of a tendency toward depression, suicidal thoughts, feeling of being out of place, and not belonging. Feelings of profound alienation, even suicide, are often the result.

Highly emotional individuals make strong attachments to people, living things, and places. When they have to move they experience great difficulties adjusting to new environments. To pull up so many roots and strike them in new soil takes up much energy; it often takes a long time, or it fails to happen. This imparts compassion toward others, sympathy for the loneliness of others. Friendships are strong and enduring. Being emotional often means to judge oneself, to carry on an inner dialogue and self-judgment on how well one does toward others, how well one carries out one's responsibilities toward others. May Sarton, quoted at the beginning, wrote of the deep collision with her "unregenerate, tormenting, and tormented self."

Intensity, passion, and sensitivity to nuances of feeling are usually associated with creative people in the arts but not in science or mathematics. Herbert Simon, a Nobel Prize winner in economics, said in an interview that there is no emotion in his creative process—only hard cognitive work and hard problem solving. This, however, is not true of other scientists. Simon took for granted his wife's contribution to his emotional well-being and overlooked the obvious fact that the intense interest driving him is an intense emotion. Louis Pasteur and Norbert Wiener, to cite just two examples, were deeply emotional and highly sensitive people. Darwin and Einstein also had a strongly emotional aspect to their personalities. The spectrum of emotions and feelings is immense and exceedingly intricate. The portion of the emotional spectrum that is characteristic of each creator is probably unique.

In his autobiography Darwin made frequent observations on his friendships and their importance to him as personal relationships in contrast to scientific ones. In describing people he always noted the emotional impact each person had on him. Recalling his childhood, Darwin confessed to an act of cruelty. He beat a puppy and it troubled his conscience for a long time.

“The exact spot where the crime was committed” was engraved in his mind. It was all the more troubling to him because he loved dogs and they often preferred him to their masters. Darwin also recalled that he was more affectionate in his youth when he had many friends among the schoolboys whom he said he loved dearly. When as a student he attended the clinical ward of the hospital some of the cases distressed him and left vivid imprints on his mind. Two surgeries he attended were performed without anesthesia— it was not yet introduced— he could not bear to stay and see them completed.

Einstein said about himself, “I am not much with people, and I’m not a family man. I want my peace.” In personal relationships he kept a distance. He concentrated all his energy on solving the riddle of how God created the universe. Yet he was also animated by deep emotions and sensibilities. He was close to his mother, to his sister Maja, and to his uncle Cäsar Koch. He was deeply honest and abhorred German militarism so strongly that from the age of 15 he sought to give up his German citizenship; a year later he became stateless; eventually he became a Swiss citizen. He cherished those few with whom he could discuss physics. Einstein said that he suffered nervous conflicts “at the very beginning when the Special Theory of Relativity began to germinate” in him. Similarly Max Planck described the 6 years of his own seminal work on the equilibrium between radiation and matter as “a process of despair” because the solution was eluding him.

As a boy Einstein had a great sensitivity to beauty and a deep religiosity. About the age of 12 he came to the conclusion that many Bible stories could not possibly be true. Religion lost its authority. This led him to suspect that all institutional authority was intentionally deceiving the young through lies. The resulting emotional crisis made him distrust every kind of authority. Einstein loved music and studied the violin but was making little progress with teachers who stressed mechanical practicing and accuracy without feeling. When he was 13 he fell in love with Mozart and his violin sonatas: “The attempts to reproduce, to some extent, their artistic content and their singular grace compelled me to improve my technique . . . I believe, on the whole, that love is a better teacher than sense of duty.”

Pasteur as a boy liked to fish but abstained from

trapping birds— a wounded bird was too much for him. The contact with his family and friends was vital to the young Pasteur. Away from home he constantly begged for more frequent and longer letters. Pasteur was also deeply religious and it pained him to see in the practice of religion so much controversy, intolerance, and lack of peace and love.

Wiener’s account of his boyhood and youth is very emotional. He remembered his first sweetheart in kindergarten— charmed by her voice he loved to stay close to her. He described his fears of the dark, injury, violence, and death and his sensitivity to the injustice and cruelty suffered by others. He was quite shaken when at the age of 13 he was told that his mother had a second child who died at birth. It shattered his sense of security to realize that his own family was not immune to tragedy. Lacking religious upbringing he learned the story of Christ’s crucifixion from his Catholic friends. The image of Christ’s wounds and the crown of thorns filled him with pain.

Despite his extraordinary abilities and being radically accelerated in school—Wiener graduated from Tufts College at the age of 14½, spent a year at Cornell, and earned his doctorate at Harvard before he turned 19— his self-confidence was undercut by his father’s demands for perfection. Even worse, his father stated publicly in print that all the boy’s accomplishments were due to the training he gave him and none to his abilities. Wiener was devastated; he felt that all his successes were his father’s but the failures were his own. He dreaded graduation, which forced him to leave the protection of childhood and face adult responsibility for himself. He seriously doubted he could succeed. “My achievement of independence during the year at Cornell had been incalculably retarded by the confused mass of feelings of resentment, despair, and rejection which had followed early in the year upon discovery of my Jewishness.” The feeling of oneness with nature, or even with the universe, is also frequently expressed by creative people.

Studies comparing artists and scientists in regard to emotionality have shown that as a group scientists tend to be less emotional. But this comparison overlooks at least two things. First, the comparison is made of adults. The examples cited make it clear that as children scientists often are emotional and sensitive but later the involvement in research restricts their emo-

tional range— recall Darwin saying that he was more affectionate as a boy. Second, there is a distinct difference in the artists' and the scientists' material. Scientists study phenomena outside themselves, which are analyzed, experimented with, and explained in objective terms. But the process of working out solutions to problems is often described as despair or torture. Whether the scientist approaches this work with passion or not does not enter the final picture. That's how science is usually viewed and portrayed. Objectivity is in fact the outcome of the collective enterprise of science in which replication of results and confirmation of theories are carried out by different people checking on each other's work. In art the very material is human subjectivity, the life of feeling to which an artist gives expression. Artists work with the complexities of human emotion and feeling. Before experience can be portrayed and expressed it has to be felt, whether in reality or in imagination.

In some cases emotional overexcitability is expressed negatively. For instance, Wagner was so self-centered that he believed that to be his friend a man had to be totally dedicated to him. Picasso, emotionally equally intense, was not far behind, being destructive in most of his intimate relationships. Somerset Maugham was often cruel to the boys procured for him. To understand what tips the balance toward a negative expression of overexcitability would require a close examination of the person's emotional development.

III. CONCLUSION

The overexcitabilities, according to Dabrowski's theory, are fundamental attributes of a creator's makeup. Without them a talent lacks richness and power. The model of developmental potential offers a way of examining the range of expressions and categories of any given overexcitability in a given creator as the palette of each overexcitability changes its spectrum from individual to individual. Advances in brain research present the possibility of examining the nature of overexcitabilities directly.

As a property of the nervous system, each overexcitability contributes significantly to the creative process by not only heightening the experience but by making it also more complex, especially when the

emotions are engaged as they almost always are. *Psychomotor* overexcitability imparts a high level of energy and drive. *Sensual* overexcitability contributes a richer and more vivid sensory experience frequently in conjunction with emotional overexcitability. *Intellectual* intensity generates relentless questioning and searching for truth. Enhanced *imagination* brings the power to envisage undreamed of possibilities, to create new realities. *Emotional* overexcitability endows the creator with greater intensity and complexity of feeling in all dimensions.

Scientists have greater emotional intensity than it is generally believed. We know today that intellectual processes divorced from emotion are ineffectual. Damasio in his *Descartes' Error: Emotion, Reason, and the Human Brain* described cases in which damage in a very small frontal area of the brain disrupted the connection between reasoning and feeling. The patient was perfectly rational on all psychological tests and yet could not bring his reasoning to any practical conclusion. Without feeling he was unable to decide which of two rational alternatives was the better one. It is therefore not surprising that creative scientists show clear evidence of emotional overexcitability, even those who would deny the role of emotion in their cognitive processes.

The problems of science are difficult. The gaps and the contradictions in our knowledge are never obvious, they have to be discovered first before they are solved. The problems of art are also difficult. The artist has to discover what experiences or humanly significant trends need to be expressed. The artist may be aware of something pushing for expression yet may need years to express it just as a scientist working on a basic problem may go through years of despair and torment before the solution appears. Work of this order requires as a starting point extraordinary equipment: intelligence, talent, and overexcitabilities.

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