

Developmental Potential of the Gifted*

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Many authors have addressed the question of the nature of giftedness and talent only to discover that many factors, components, traits, facets, and potentialities are not captured by the tests in use (Bloom, 1963; Gallagher, 1975; Hoyt, 1966; Nicholls, 1972; Passow, 1981; Wing & Wallach, 1971). That a gifted child is not reliably the parent to a gifted adult—not all gifted children fulfill their promise and adult late bloomers are not counted earlier among the gifted—has been established over and over again; it has been said that the psychometric approach has failed in its predictive promise (Feldman, 1977; Gruber, 1982; Renzulli, 1978). But the problem of what makes for mature giftedness and talent remains; what are all those contributing skills, endowments, or personal powers by which true giftedness is recognized?

Inevitably our approaches are a function of our definitions, be they explicit or implicit. Terman's definition of intellectual giftedness as the top one percent of the population on a standardized measure established a method of deciding who was gifted and who was not. Now Renzulli's (1978) proposal to use three clusters of ingredients of giftedness—above average ability, task commitment, and creativity—provides a new, explicit definition and a new strategy. Implicit in this definition is the criterion of social usefulness: the three clusters are found together in people who are productive and who make creative contributions in their fields of endeavor. Newland (1976) went so far as to suggest periodic adjustment of the definition of who is gifted, based on social demand.

The criteria of productivity and social usefulness deal only with the optimal combination of many capabilities and fail to look at them individually, independently of their social application. Albert (1975), for example, defined genius in terms of early start and sustained productivity but left out of the picture the structure of a mind that works in unprecedented ways. A person with a 160 IQ who is not creative or productive still possesses a set of unusual mental gifts. A chess champion's extraordinary capacity for solving chess problems does not make him or her creative, nor does it make him or her productive—winning prizes produces little except a perpetuation of chess competitions. Yet, a chess master has unusual and fascinating mental capabilities whose workings can be studied to produce knowledge and understanding of human intelligence.

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From the point of view of research and theory, studying a phenomenon in its pure form is the more fruitful approach. A criterion of social usefulness would limit us to a social definition of a phenomenon which is not of social origin. Giftedness begins with some form of native endowment, the organism's original equipment. Feldman (1979), Gardner (1982), and Sternberg (1980) take the more basic approach: they strive to identify specific units of mental equipment, or, as Gardner is fond of calling them, "specific computational devices". Investigating the workings of such units or devices, one can uncover the way they are designed (that is, the way they evolved to carry out specific functions) and then see how their different versions combine in each individual. The purest examples of such units operating without connection with other critical units of the mental apparatus are found in *idiots savants*, autistic children, child prodigies, and patients with localized brain damage (Gardner, 1975). Gardner (1982, p. 51) says:

I propose that human cognitive competence be thought of as consisting of a number of autonomous, or semi-autonomous, domains of intellect. Each of these intellectual competences has its own genetic origins and limitations as well as its own neuroanatomical substrate or substrates . . . These intellectual competences or "intelligences" have evolved over millions of years in order to carry out specific hominoid problem-solving and production activities, including finding one's way around the environment, making tools, and communicating and interacting successfully with other individuals . . . All normal individuals possess some potential for developing each of the intellectual competences, but individuals differ from one another in the extent to which they can and will realize each competence.

The advantage of this approach is that it provides the logical basis for individual psychology, that is, for the study of structure and design of mental processes and the manner in which their elements vary across individuals, as opposed to the study of individual differences in terms of group norms and deviations from such norms. This structural or "faculties" approach is eminently suited for the study of the gifted individual.

The Model of Developmental Potential

The model to be presented here follows similar principles. It defines five parallel dimensions or modes of mental functioning assumed to be genetically independent of one another. In this model, the strength of these five dimensions

is taken to be a measure of the person's developmental potential (DP), hence, also of the person's giftedness (Piechowski, 1979). Everything we have discovered so far—intellective factors, motivational factors, special aptitudes, Gardner's "intelligences"—all are part of a picture which is always incomplete. The model of developmental potential fills in certain broad and important areas.

The five modes encompassed by the model are represented by five forms of so-called psychic overexcitability. This term was first introduced by Dabrowski (1938) to describe an expanded and intensified manner of experiencing in the psychomotor, sensual, intellectual, imaginal, and emotional areas. The prefix *over* in overexcitability is meant to convey that this is a special kind of responding, experiencing, and acting, one that is enhanced and distinguished by characteristic forms of expression.

As personal traits, overexcitabilities are often not valued socially, being viewed instead as nervousness, hyperactivity, neurotic temperament, excessive emotionality, and emotional intensity that most people find uncomfortable at close range. Dabrowski, perceiving their developmental significance, deliberately gave these manifestations a new name. He was not the first to see the positive side of such a temperament which, in a still earlier epoch, was called "psychopathic." William James (1902, p. 26) saw in the intensity and overemphasis of highly emotional people a necessary condition of being genuinely rather than superficially moral:

Few of us are not in some way infirm, or even diseased; and our very infirmities help us unexpectedly. In the psychopathic temperament we have the emotionality which is the *sine qua non* of moral perception; we have the intensity and tendency to emphasis which are the essence of moral vigor; and we have the love of metaphysics and mysticism which carry one's interests beyond the surface of the sensible world. . . . If there were such a thing as inspiration from a higher realm, it might well be that the neurotic temperament would furnish the chief condition of the requisite receptivity.

And further (p. 24-25),

But the psychopathic temperament . . . often brings with it ardor and excitability of character. The cranky person has extraordinary emotional susceptibility. He is liable to fixed ideas and obsessions. His conceptions tend to pass immediately into belief and action; and when he gets a new idea, he has no rest till he proclaims it, or in some way "works it off." "What shall I think of it?" a common person says to himself about a vexed question; but in a "cranky" mind "What must I do about it?" is the form the question tends to take. . . . Thus, when a superior intellect and a psychopathic temperament coalesce—as in the endless permutations and combinations of human faculty, they are bound to

coalesce often enough—in the same individual, we have the best possible condition for the effective genius that gets into the biographical dictionaries. Such men do not remain mere critics and understanders with their intellect. Their ideas possess them, they inflict them, for better or worse, upon their companions or their age.

Here James connects superior intellect and heightened emotional excitability. His "effective genius that gets into the biographical dictionaries" is the operational genius of Albert and Renzulli. He describes characteristics which endow certain individuals with capabilities absent in others, capabilities that open doors to other realms, that make these individuals see certain truths with unusual vividness, and that compel them to seek answers to questions which to others are only matters of opinion. Gallagher (1975, p. 64), more recently, echoes an aspect of James' insight in his view that hyperactivity might, under some conditions, be an asset to intellectual development. Both James and Gallagher describe what are, in Dabrowski's appellation, forms of psychic overexcitability. Let us review these five forms briefly. All of the illustrative examples given below are direct quotes from gifted adolescents (see Note 1). A more detailed description exists (Piechowski, 1979).

Psychomotor overexcitability (P) may be viewed as an organic excess of energy, or heightened excitability of the neuromuscular system. It may manifest itself as a love of movement for its own sake—rapid speech, pursuit of intense physical activity, impulsiveness, restlessness, pressure for action, or drivenness; the capacity for being active and energetic.

When I am around my friends, I usually come up with so much energy I don't know where it came from. Also when I am bored, I get sudden urges and lots of energy that can be dealt with by doing a physical sport or activity such as bike riding, jogging, walking, or playing basketball. Sometimes during class (it happens quite often) I get bored because I understand what is being taught, and get a lot of energy. This energy is used to goof off, even though I know I shouldn't. The energy seems to just swell up inside of me, then just flows over. Honestly, some classes are boring and I wish those who understand could go ahead and work, then maybe I wouldn't use my energy so harmfully. (Female, age 13)

[I have the greatest urge to do something] mainly when I haven't been doing anything. Like when I've been doing a long homework assignment or sitting typing more of my book I suddenly get the urge to shoot some baskets or bike ride or something. Usually I just get up and walk around for a while if I'm really in need of finishing my homework. If not I usually go outside and let my dog chase me around for a while. (Male, age 15)

Sensual overexcitability (S) is expressed in the heightened experience of sensual pleasure and in seeking sensual outlets for inner tension. Beyond desires for comfort, luxury, stereotyped or refined beauty, and the pleasure in being admired and taking the limelight, sensual overexcitability may be expressed in the simple pleasure of taste and smell, for instance, the smell of car exhaust. In short, it is the capacity for sensual enjoyment.

I love to have something that tastes good in my mouth. I just really enjoy good tasting things. If I taste something I like I can't stop eating it. (Male, age 14)

[What kind of physical activity (or inactivity) gives you the most satisfaction?] If I said sex would you die laughing or just be shocked? (Female, age 16)

[Is tasting something very special to you?] Yes, it is. Maybe that's why I'm so "picky." Taste depends on flavor, texture, consistency, smell, color and appearance. Beans are so gross! They are just *there*, they don't do anything for you. Whipped potatoes in butter—they are fun! You can do anything with them! Not that food has to be fun—simply being good in flavor is all right, too! (I don't mean to sound like a Jell-O commercial. Watch it shimmer!). (Female, age 16)

Intellectual overexcitability (T) is associated with an intensified activity of the mind. Its strongest expressions—persistence in asking probing questions, avidity for knowledge and analysis, preoccupation with logic, and theoretical problems—have more to do with striving for understanding and truth than with academic learning and achievement. Other expressions are: a sharp sense of observation, independence of thought (often expressed in criticism), symbolic thinking, development of new concepts, striving for synthesis of knowledge; a capacity to search for knowledge and truth.

I can't resist math puzzles, or brain teasers of any kind, and I go to ridiculous lengths to figure them out. When I'm being sensible I know they're a waste of time, but I can't see one without working it out. I guess I'm conceited—I don't like to think that there is anything I can't figure out. My favorite puzzles are the logic puzzles in which they give a set of facts that must be combined in order to find the answer. (Female, age 16)

Yes. [I think about my own thinking,] sometimes I get a long line of thinking and I go back and trace from where I started, and usually it is from the most insignificant thing, or, I am appalled at how I have compared something. (Male, age 14)

I don't very often [catch myself seeing or imagining things that aren't really there.] Instead, I analyze things that are there in different ways. I read stories

deeper, read into questions, find catchy puns or mistakes of words in people's writings, etc. If something has no meaning I try to give it some. If it means something I wonder why. I usually find when given a topic to write about, for example, I usually have a completely different approach to the same topic than does the rest of the class. (Male, age 16)

Imaginational overexcitability (M) is recognized through rich association of images and impressions, inventiveness, vivid and often animated visualization, use of image and metaphor in speaking and writing. Dreams are vivid and can be retold in detail. Living in the world of fantasy, predilection for fairy and magic tales, poetic creations, imaginary companions, or dramatizing to escape boredom are also observed.

I like to think about things not too many people do. Like what will fire hydrants look like in the future.

Sometimes I used to pretend I had a little brother or sister, or I would imagine myself in a rabbit hole watching thousands of wild horses galloping over me. (Female, age 13)

I also have one [fantasy] in which I can get inside people's heads to see what "makes them go" or can make everything and everyone freeze in their tracks (everyone except me) so I can go around and see what they are doing. (Male, age 15)

In a real event, if it does not particularly interest me, I only see a few highlights. If it is a real event that terrifically interests me I only see the main highlights and supporting details. If it is imaginary I can visualize it down to the last detail. I do this a lot. I also take real events and change them around in my imagination to make them appeal more to me. (Male, age 15)

Emotional overexcitability (E) is recognized in the way emotional relationships are experienced, in strong attachments to persons, living things or places, and in the great intensity of feeling and awareness of its full range. Characteristic expressions are: inhibition (timidity and shyness) and excitation (enthusiasm); strong affective recall of past experiences, concern with death, fears, anxieties, depressions; there may be an intense loneliness, and an intense desire to offer love, a concern for others. There is a high degree of differentiation of interpersonal feeling. Emotional overexcitability is the basis of one's relation to self through self-evaluation and self-judgment, coupled with a sense of responsibility, compassion, and responsiveness to others.

When I kill a fly or an ant or any other insect, I suddenly get a feeling like, "Should I have done that? That's really just like going and killing a human being. I bet the animals have their own life, feelings, they must because they are really very intelligent." The next time a fly gets in the way, I

usually just let it go, because I feel guilty. (Female, age 13)

I spend my time writing poetry once in a while. Every time I write a poem, it comes out as a poem about someone I love, something I love, something that won't always be around or something special to me. Sometimes I write of sad things to take the hurt out of me. I can never write poetry unless it is something *very special* to me. (Male, age 13)

[If you ask yourself, "Who am I" what is the answer?] Usually the answer is: An insignificant human speck in the vast universe trying to make something out of itself but will probably not succeed. A biological imperfect being destined for certain death in the end and being forgotten even though it attempted to make something of itself. But sometimes I get an irrational response: You are a perfect intelligence. You are destined to become a powerful person. This response sometimes scares me. (Male, age 15)

The above examples are taken from responses given by gifted youngsters to the Overexcitability Questionnaire (OEQ). The method and the different studies to be compared here are described below.

This study is an attempt to assess components of giftedness defined by the model of developmental potential, that is, the strength of the five modes of mental functioning. The model combines both the intellective—represented by T—and the nonintellective components—represented by E, M, S, and P—of giftedness.

By choosing to compare overexcitability profiles of gifted adolescents with those of gifted and nongifted adults we sought to obtain a cross-sectional view of the development of these variables.

Method

Subjects

Subject samples come from several studies. Iowa gifted adolescents ($N = 49$), 26 girls and 23 boys, age 12-17, mean age 14.8, were drawn from gifted programs in seven schools scattered throughout the state, part of a study by Colangelo, Piechowski, and Kelly (Note 1). Their entry into these gifted programs was based on a combination of test scores, grades, and teacher nominations. Volunteer participants formed this sample and all the other samples in the study. The intellectually gifted adults, $N = 28$, 21 women and 7 men, age 22-55, mean age 36.4, are from a study by Silverman and Ellsworth (1981). They were either Mensa members (98th percentile or better on a standard test of intelligence) or persons qualified for similar status on the basis of high GRE, SAT, IQ scores, former placement in gifted classes, or known and recognized scholarly achievement. The artists, $N = 19$, 12 women and 7 men, age 18-59, mean age 33.9 are from a study by Piechowski, Silverman, Falk, and Cun-

ningham (Note 2). They include writers, poets, singers (rock and classical), film producers, dancers-choreographers, a graphic designer, and a weaver. The graduate students, $N = 42$, 30 women and 12 men, age 22-50, mean age 29, are taken from a study by Lysy and Piechowski (1983). They include students in counseling, history, linguistics, natural science, education, library science, political science, and religious studies. We assume most of them are not gifted, based partly on the content of their responses and partly on the fact that their mean overexcitability scores are nearly identical to those of a sample of community women ($N = 51$) whose mean number of years of schooling (15.12) and general level of achievement are lower than those of graduate students (Beach, 1980).

Instrument

The Overexcitability Questionnaire (OEQ) is a 21-item, free-response instrument with half a page blank per item. It is derived from an earlier longer questionnaire (Piechowski, 1979; Lysy & Piechowski, 1983). Subjects write their responses at their leisure. On each of the 21 items, one point is scored for each OE that can be identified in the response. For example, in the following excerpt in answer to the question, "What kinds of things get your mind going," we can identify an element of intellectual overexcitability in the girl's interest in math problems and in her urge to pursue problems to completion, imaginal overexcitability in her eidetic-like experience while reading, and emotional overexcitability in her feeling for the characters in the story:

Right now, the problems we are doing in Senior Math get my mind going. I really don't like to leave things unanswered but sometimes they are pretty frustrating. I can also get pretty involved in some of the books I read. Sometimes I feel as though I am right there where it is happening and I can feel emotion for the characters. (Female, age 17)

This response is scored one point for each of the three forms of OE: T, M, and E. The total score is thus a simple frequency count of the number of responses in which a given OE was observed. The highest possible score is 21 for each of the five OEs. The questions, as also illustrated in the foregoing example, do not predetermine the OE mode of the response because for many people, not only intellectual stimuli but emotions, images, sensual pleasures, or sports can get their mind going as well.

The scoring procedure is conservative: responses minimally adequate to be regarded as expression of an OE are given the same weight of 1 as responses containing richly elaborated and multiple expressions of an OE. What compensates for this to some degree is that subjects with abundant OEs tend to generate OE material more often,—more items of their OEQ protocols receive OE scores.¹

The OEQ protocols are rated independently by two raters. Disagreements on item scores are resolved by arriving at a consensus. The interrater correlation coeffi-

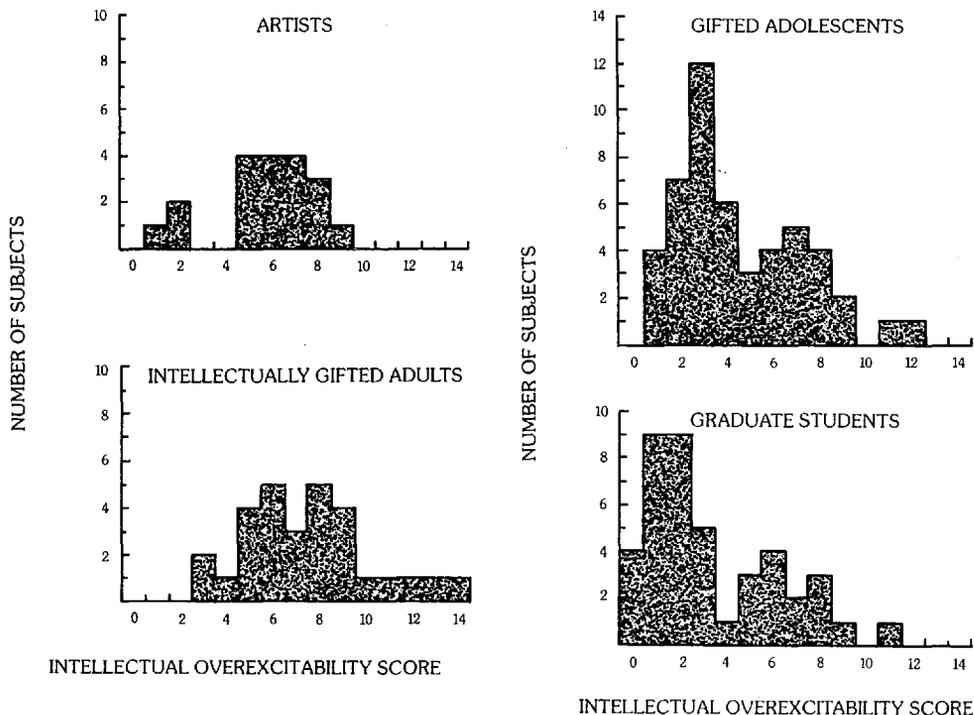


Figure 1. Intellectual overexcitability scores in four different samples.

icients (Pearson's *r*'s), obtained with different pairs of raters prior to consensus, range from .60 to .95, most commonly from .70 to .80. The correlation between the individual rater's score and the final consensus scores is on the average .82 (Piechowski, Silverman, Falk, & Cunningham, Note 2).

Data Analysis

Figure 1 shows that the scores in our samples are not normally distributed. For this reason, the nonparametric Mann-Whitney two-sample rank test was used in all comparisons. Also, this procedure allows a comparison between samples of unequal size. The Mann-Whitney test gives a *p* value for the probability of the two samples having an identical distribution of scores. The smaller the *p*, the farther apart are the sample distributions. Hence, the more different they are from each other in regard to the variable measured.

Results

Table 1 shows the mean overexcitability scores of three groups: intellectually gifted adults (A), gifted adolescents (B), and graduate students (C). Three comparisons are made: gifted versus nongifted adults (A versus C), young versus adult gifted (A versus B), and gifted adolescents versus nongifted adults (B versus C). The first comparison shows that gifted adults are characterized by significantly higher scores on T, and E OEs than nongifted adults. The second comparison shows that the younger gifted group is characterized by lower scores on S and T OEs but similar to the adult gifted on M and E OEs. The third comparison combines the gifted versus nongifted and young versus adult tests of difference. The gifted adolescents are again lower than the adult graduate students on S, leading to the conclusion that sensuality has more to do with age (maturity) than with giftedness. The gifted adolescents, like the

Table 1
Mean Overexcitability Scores of Intellectually Gifted Adults, Gifted Adolescents, and Graduate Students

Overexcitability (OE)	A Gifted Adults N = 28	P _{AB}	B Gifted Adolescents N = 49	P _{BC}	C Graduate Students N = 42	P _{AC}
Psychomotor: P	3.61	.071	2.90	.55	3.00	.18
Sensual: S	4.43	.0000	1.76	.0014	3.36	.11
Intellectual: T	7.46	.0001	4.59	.015	3.40	.0000
Imaginational: M	5.18	.86	4.96	.033	3.69	.11
Emotional: E	7.39	.40	7.31	.0002	4.79	.01

Note. The value of p, obtained by the Mann-Whitney test, represents the probability of the two samples having an identical distribution of scores.

Table 2
Mean OE Scores of Intellectually Gifted Adults, Gifted Adolescents, and Graduate Students whose T OE Score Is 5 or More

Overexcitability (OE)	A' Gifted Adults N = 25	P _{A'B'}	B' Gifted Adolescents N = 20	P _{B'C'}	C' Graduate Students N = 14	P _{A'C'}
Psychomotor: P	3.56	.33	3.15	.41	3.57	.85
Sensual: S	4.32	.0001	1.50	.004	4.14	.79
Intellectual: T	7.96	.51	7.35	.52	6.93	.24
Imaginational: M	5.28	.72	5.35	.64	4.93	.79
Emotional: E	7.88	.76	7.35	.50	7.00	.33

Note. See note to Table 1.

adults in the first comparison, are higher than the graduates on T and E OEs, supporting the conclusion that these two OEs are characteristic of giftedness. The gifted adolescents are also significantly higher on M OE lending support to the significance of a similar difference on M between the gifted adults and graduate students.

Psychomotor OE provided no significant differences between these three groups. The level of sensual OE appears to be a function of age. We are left with T, E, and M OEs as the significant variables distinguishing a gifted from a nongifted sample. The graduate students' significantly lower scores on these three principal OEs are consistent with the assumption of the graduates' largely nongifted status.

If the gifted adolescents' lower S scores are a function of age, is their lower T score also a function of age? It could be that the lower mean score of the younger group is not a function of age but of a heterogeneity in the score distribution. Figure 1 shows that this is so. The distribution of T scores for gifted adolescents is bimodal. The same is true of the graduate group. The lower graduate group has T scores from 0 to 3, the higher from 5 on up. The lower adolescent group has T scores from 1 to 4, the higher from 5 on up. Ninety percent of the gifted adults (25 out of 28) have T

scores of 5 or more. Eighty-four percent of the artists (16 out of 19) also have a score of 5 or more (this is why this group is included here). We are simply noting that a numerical cliff between the scores of T = 4 and T = 5 occurs in four independent samples. When all the samples are added together (N = 138) the deep cleft at T = 4 is clearly visible (Figure 2).

The bimodality of the T score distribution suggests that it might be interesting to divide the adolescents and the graduates into two groups, one with T ≤ 4 and one with T ≥ 5, and examine their OE profiles. We want to know how these subgroups compare on the remaining OEs particularly M and E. Table 2 shows that in regard to the distribution of M and E OE scores, the subgroups of gifted adolescents and graduates selected on the basis of T ≥ 5 are indistinguishable from each other and from the gifted adults. Although we have no other supporting data, it is plausible that the 14 graduate students so selected are gifted.

When gifted adolescents with T ≤ 4 are compared with their graduate counterparts (Table 3), they show significantly higher mean scores on T, M, and E. When the two subgroups of gifted adolescents (B' and B'') and the two subgroups of graduates (C' and C'') are compared with each other. (Table 4), it is evident that the adolescents'

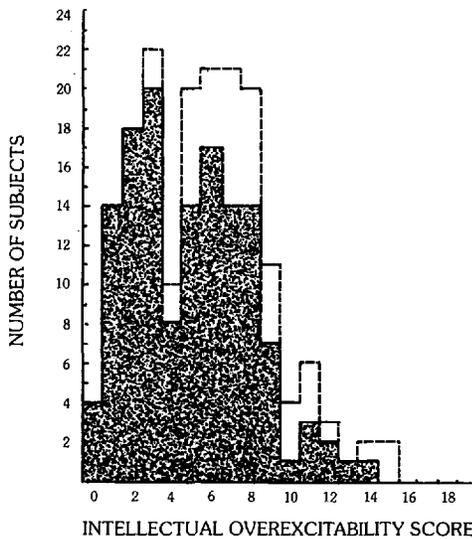


Figure 2. Bimodality in the distribution of intellectual overexcitability scores when the samples depicted in Figure 1 are combined (N=138). Dotted line represents the scores of gifted children, ages 9, 11, and 13, from the University for Youth in Denver (N=41).

mean scores on M and E are unchanged: they retain their gifted profile on these two dimensions. The lower scoring graduates, however, are also significantly lower on E ($p < .01$). Whether the lower T score of the B⁺ group is the result of a developmental lag or a different selection procedure awaits resolution.

The consistent pairing of T, M, and E scores in the higher scoring groups could be the result of a high correlation between these variables which would argue against the assumption of their independence. Table 5 shows that the three variables do not correlate highly, nor are they uniform in the pattern of correlations across groups examined here. This is consistent with the assumption of their independence.

Discussion

Our results show that both gifted adolescents and gifted adults, as a group, are characterized by two nonintellective factors, imaginal (M) and emotional (E) overexcitabilities, and by intellectual (T) overexcitability. Intellectual overexcitability occupies a special position. On the one hand it is related to intellective capabilities; on the other, as

Table 3
Mean OE Scores of Gifted Adolescents and Graduate Students Whose T OE Score is 4 or Less

Overexcitability (OE)	B ⁺ Gifted Adolescents N = 29	P ^{B⁺C⁻}	C ⁻ Graduate Students N = 28
Psychomotor: P	2.72	.96	2.71
Sensual: S	1.87	.027	2.96
Intellectual: T	2.69	.0008	1.64
Imaginational: M	4.69	.004	3.07
Emotional: E	7.27	.0001	3.68

Note. See note to Table 1.

Table 4
Probabilities of The High and Low T OE Scores Having an Identical Distribution of OE Scores

Overexcitability (OE)	P ^{B⁺B⁻}	P ^{C⁻C⁺}
Psychomotor	.72	.072
Sensual	.33	.19
Intellectual	.0000	.0000
Imaginational	.39	.10
Emotional	.79	.009

Note. P^{B⁺B⁻} compares the distribution of OE scores in gifted adolescents with a T OE score of 5 or more (B⁺) with that of gifted adolescents with a T OE score of 4 or less (B⁻). Analogously, P^{C⁻C⁺} compares the distribution of OE scores in the two groups of graduate students (C⁻ and C⁺). The mean OE scores for the four groups are shown in Table 1.

Table 5
Correlations Between Intellectual (T), Imaginational (M), and Emotional (E) Overexcitabilities

	T with M	T with E	M with E
Gifted adolescents (B ⁺)	-.061	-.153	.537
Graduate students (C ⁻)	-.528	-.127	.389
Gifted adults	.436	.051	.083
Gifted adolescents (B ⁻)	.420	.346	.166
Graduate students (C ⁺)	-.182	.231	.230
Total gifted adolescents (B ⁺ + B ⁻)	.166	.054	.294
Total Grads (C ⁻ + C ⁺)	.148	.407	.426

Note. B⁺ and C⁻ designate groups with a score of T of 5 or more, B⁻ and C⁺ designate groups with a score of T of 4 or less.

intellectual fervor and a drive to pursue existential and moral questions, it goes beyond the purely intellectual. The level of these variables shows no age trends; the younger group's mean scores on E and M OEs are equal to those of the adults. In regard to T OE, a subsample in the younger group is equal to the adults; the subsample with lower T OE scores is, nevertheless, significantly above a corresponding sample of graduate students.

The bimodality in the distribution of T scores becomes plainly visible when the data from all the samples are pooled together as shown in Figure 2. This is further supported by data on another group of gifted children, age 9-13, recruited from among the participants at the University for Youth, a program for gifted and talented children at the University of Denver (Piechowski, Note 3). The admission requirements of this program are the students' attaining achievement test scores of 2.0 or more grade levels higher than their current placement. Ninety percent of these children (37 out of 41) have T scores of 5 or more. Added to the four previous samples (dotted line in Figure 2) they further accentuate the deep cleft at $T = 4$. This group, like the gifted adults, is unimodal in regard to T OE, and in its profile of OE scores it is also like them and the "B" group of the gifted Iowa adolescents as well.

In contrast to T, the distributions of E and M scores are not bimodal, although there is a sharp drop in M scores between 5 and 6.

One of the unexpected findings of this study is the constancy of the group OE scores across different ages. The youngest gifted groups (age 9 and 11 in the Denver sample) have each the same OE profile of T, M, and E as the gifted adults. This constancy supports the idea of developmental potential as original equipment (Piechowski, 1975). Studies of younger children will be critical for testing the validity of this idea; the need for a longitudinal study starting at a very young age is evident.

In individuals, the three variables are not consistently linked, although the correlation between M and E is always positive (Table 5). The correlations between T and M, and between T and E have no consistent pattern and can even be negative. The individual scores of the gifted can be as low as 1 and as high as 16, and perhaps even more; the lower scores overlap with the non-gifted range. A gifted child may be high or low on any of the three overexcitabilities, T, M, or E, but will not be low on all of them at once and is very likely to have elevated scores on any two. This allows for a great deal of individual variation.

The OEs are not like the specific domains that Feldman and Gardner identified as areas of competence, excellence, and prodigious achievement. Rather, they represent the kind of endowment that feeds, nourishes, enriches, empowers and amplifies talent. Without the overexcitabilities a talent would be no more than a bare computational device.

Overexcitabilities are modes of enhanced mental func-

tioning; they can be thought of as channels of information flow. They can be widely open, narrow, or operating at a bare minimum. They certainly are wide open in artists. Artists are the creative *par excellence*. As a group they score higher than anybody else on M and E (Piechowski, Silverman, Falk, & Cunningham, Note 2). This suggests forcibly that to be truly creative, and creatively productive, one must have a higher endowment on these two dimensions. The model presented here suggests also a possible distinction between intellectual and creative giftedness. The intellectually gifted and the artists share a higher than average endowment on the three principal OEs. But while both groups display similar levels of intellectual overexcitability (though probably different in content); the artists have, in addition, much more of imaginal and emotional overexcitability.

In conclusion, although the level of each OE varies considerably across gifted individuals, the OEs are consistently and reliably present in a gifted group of any age (i.e., as low as age 9). The OEs appear to be a promising ground in which to find those endowments and potentialities that make for "the effective genius that gets into the biographical dictionaries."

Summary

Two nonintellectual variables, representing the imaginal (M) and the emotional (E) dimensions of mental life, and one broadly intellectual variable (T) have been identified as characteristic of giftedness. A cross-sectional comparison showed no age trend when groups of gifted children (as young as age 9) and adolescents are compared with gifted adults. The broadly intellectual variable T showed bimodal distribution creating two subsamples, one with T scores lower than 5, and one with T scores of 5 or more. This did not affect the M and E mean scores of the two subsamples of gifted adolescents. The three variables, E, M, and T are viewed here as critical contributors to the creative power and productivity of gifted people.

Reference Notes

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2. Piechowski, M. M., Silverman, L. K., Cunningham, K., & Falk, R. F. A comparison of intellectually gifted and artists on five dimensions of mental functioning. Paper presented at the annual meeting of the American Education Research Association, New York City, March, 1982.
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Footnote

1. More recently, weights of 1, 2, and 3 are given to each single OE score in order to take into account the degree of richness and intensity of the response. Comparison with other samples which were not scored this way is, of necessity, limited to the conservative procedure outlined here.

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