

Lasting inhibition of creativity in highly gifted underachievers: therapeutic reflections based on negative results of a pedagogical project

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Summary

Background: Psychological and neuropsychological characteristics of gifted children and adolescents, especially their predisposition to creativity, are analysed.

Aims: 108 students of 4 different 10th forms of secondary school participated in a pedagogical project including special educational measures aimed at developing creativity, communication and teamwork.

Methods: The results were evaluated with the help of a mixed-methods design, combining cognitive tests, psychometric scales exploring coping strategies, anxiety and aggression, expressive tests and external evaluation criteria. Comparative pretest-posttest, correlational and multidimensional analyses were computed using non-parametric statistical procedures.

Results: Whereas highly gifted normal achievers largely took advantage of the project, there were diverging results in different sub-groups of highly gifted students, depending on their personality traits and their former school performance.

Discussion and Conclusion: The concept of mentalization allowed creating meaning and understanding the ambiguities of the results. Pedagogical and psychotherapeutic measures could be drawn out of the study, as well as tracks for future research.

aggression, anxiety, coping strategies, creativity, giftedness, mentalization, non-parametric statistical procedures, underachievement

1. INTRODUCTION: GIFTEDNESS, CREATIVITY, INHIBITION

Psychological and Neuropsychological Characteristics of Gifted People

Since the 1980s, the characteristics of gifted children and adolescents, who are traditionally defined by an I.Q. ≥ 130 in most Western countries,

have been explored by researchers in developmental and cognitive psychology.

According to Webb [1], intellectually precocious children differ from the rest of the population in the following significant psychological characteristics:

- Thirst for knowledge
- Desire to get to the bottom of things
- Creativity
- Personal involvement
- Interest in social and moral questions

Vichot-Chalon [2] summarises the characteristics of precocious children with regard to their intelligence profiles. They have exceptional perception capabilities, selective attention capabilities, memory capabilities (great effectiveness of the working memory). They hence characterise themselves by their cognitive mobility that allows them to make multiple decompositions, subtle distinctive analyses, combinations of hypotheses, reorganisations of prior knowledge.

Compared to Piaget's stages, precocious children reach the level of formal thinking earlier, by using abstract notions at a time when the majority of the children are at the concrete operational stage [3, 4]. According to research results interpreted in a neo-Piagetian perspective, it seems that the construction of reality is different in gifted people, that they have higher capabilities of social cognition and that their access to metacognition, i.e. the capability to think about one's own thought processes, is also more precocious [5,6].

A relevant question in the care of gifted students who experience academic failure is about the obligatory inclusion of creativity in the education profile. The relationship between general intelligence and creativity is certainly not a linear one. The first studies on the relationship between convergent thinking and divergent thinking [7-9] have shown that, with gifted subject, the correlations between these two types of tests are much higher than in the general population. On the other hand, below a certain threshold corresponding to an IQ of 125, intellectual creativity cannot develop freely [10, 11]. Gifted children and adolescents thus have a strong predisposition for creativity, at least in the intellectual realm [12, 13].

Another approach emphasises the affective and motivational components of giftedness. In his theory of multiple intelligences, Gardner [14] distinguishes between seven types of intelligence: linguistic, logical-mathematical, spatial, musical, bodily-kinaesthetic, interpersonal, and intrapersonal. For the last two types of intelligence, corresponding on the whole to the capability of emotional control, he suggests the naming of E.Q. (emotional quotient), and he develops a series of tests allowing to measure the handling of emotionality. The E.Q., even if it is harder to quantify, completes the I.Q. in a useful way in the prediction of academic achievements.

One has to emphasise that the motivational component is a major condition of the actualization of intellectual precocity, as it allows to support the temporary uncertainties and to overcome the obstacles; it is thanks to the former that people anticipate the future and develop long-term time perspectives for their projects. By including motivation in his modelization, Renzulli [15] has also taken into consideration the pleasures that one feels if they are able to dedicate themselves to an activity they are attracted to (cf. the concept of intrinsic motivation, or Csikszentmihalyi's "flow" [16]).

Shi [17] suggests a model of exceptional creative performances, including the intellectual level or potential, non-intellectual personality traits, knowledge, the attitude towards a task and the influences of the family and social environment. The author emphasises the importance of "the habit of creativity" that characterises highly creative individuals and that is linked to intrinsic motivation.

What about the neuropsychological correlates of giftedness?

When the first intelligence tests were elaborated, a factor of general intelligence called G factor had been exposed by Spearman [18]. Neuropsychological research on memory provides first indications concerning physiological foundations of general intelligence. This could allow a better understanding of the significance of the G factor, a second-order factor linking the different specific factors that have appeared in the analysis of intelligence tests.

De Groot [11] has shown that gifted children benefit from a better short-term memory, where the quantity of stored information and the short-term storage duration positively correlate with the I.Q. In a study on the potential auditory recollections, Eysenck [19] demonstrated that their latency is significantly decreased in precocious children and that the rate of the cerebral transmission and hence the quantity of transmitted information per time unit significantly correlates with the I.Q.

Neurophysiological research also supports the hypothesis of gifted students' specific capability to learn, linked to a particular functional organisation of their neural network [20-22], promoting resolution of complex problems thanks to the capacity of their working memory and

the velocity of its operations. A better integration and synthesis of information is due to this feature.

In light of these research data, the results of a pedagogical project we will present seem rather paradoxical. Clinical considerations will help give meaning to our observations.

2. A PEDAGOGICAL PROJECT IN MIDDLE ADOLESCENCE

2.1. Aims and Research Questions

The “creativity” project was aimed to improve such competences as “creativity”, “communication” and “teamwork” in two 10th forms, by means of appropriate educational methods. The experimental design had been laid out in such a way that, apart from the general evaluation of the experience, it allowed to answer the following questions: Is it possible to overcome the enduring inhibition of creativity and intellectual functioning reflected in enduring academic difficulties in highly gifted underachievers by using appropriate educational means? Does pilot class participation, with precise educational objectives, turn out to be more favourable for highly gifted underachievers than control class participation? Is there a differential evolution of highly gifted underachievers, in terms of academic performance and measures of creativity, in relationship with personality-related variables (especially regulation of aggression and anxiety)?

2.1. Evaluation Methodology

2.1.1. Experimental Design and Participants

The experimental design allowed to combine the pretest-posttest comparisons of the clinical group, called “highly gifted underachievers” (UA), with a control group, called “highly gifted normal achievers” (NA), in the forms participating in the pilot experience (experimental forms) and in 2 other forms, selected because of their similar profile regarding the distribution of the intelligence test results (control forms). Within the control forms, we have hence also established a clinical group (UA2) and a control

group (NA2), according to the same criteria as the experimental groups (UA1 and NA1). Thus, the results that we will present arise from inter – and intragroup comparisons of the following 4 sub-groups:

Experimental classes: A + B; N = 53 students (26 + 27)

Control classes: C + D; N = 55 students (29 + 26)

Clinical group: 2 sub-groups UA1 (classes A + B) and UA2 (classes C + D);

N = 23 students (17 + 6)

Control group: 2 sub-groups NA1 (classes A + B) and NA2 (classes C + D);

N = 19 students (14 + 5)

The inclusion criteria, expressed in C values, were:

LPS-GL $\geq 8, 5$

School Results $\geq 7, 5$ for the normal achievers

School Results ≤ 3 for the underachievers.

Thus, the gap between the actual academic performance and the theoretical performance estimated based on the intelligence test results is considerable among the clinical group. The experimental design was based on a prospective longitudinal study, aiming at exploring changes between the first and the third term of the school year (table 1).

Table 1. Experimental Design

	Pretest	Intervention	Posttest
Clinical group 1: UA1	A1	B	A2
Clinical group 2: UA2	A1		A2
Control group 1: NA1	A1	B	A2
Control group 2: NA2	A1		A2

2.1.2. Measures

We used an integrated quantitative and qualitative approach combining psychometric and projective tests. The evaluation of the students’ intellectual potential was conducted by means of Horn’s Leistungsprüfsystem [23].

Anxiety and aggression were measured with the following psychometric questionnaires:

Angstfragebogen für Schüler [24]

Fragebogen zur Erfassung von Aggressivitätsfaktoren [25].

To evaluate creativity in combination with other personality traits, we developed an original expressive test, based on stories written under musical induction [26].

2.2. Results

We will present some experimental and clinical results related to the above research questions.

2.2.1. Intra – and Intergroup Comparisons

a) Summary of the pretest-posttest intragroup comparisons: School Results.

Performance rates of the highly gifted “underachievers” have decreased in the course of the year, but this phenomenon was observed rath-

er in the experimental classes, where the gap between the “underachievers” and the “normal achievers” has become even more apparent. The highly gifted “normal achievers”, on the other hand, seemed to be benefiting entirely from the educational experience that they were offered. The “underachievers” of the control group tended to cope a little better, but still failed to make up for their global delay.

b) Summary of the pretest-posttest intragroup comparisons: Expressive Test (table 2)

Table 2. Pretest-posttest Intergroup Comparisons at the Expressive Test; Wilcoxon's Sign Rank Test

Variable	UA1	UA2	NA1	NA2
Creativity	Pre>Post	Pre>Post	Pre< Post	n.s.
Productivity	Pre>Post	Pre>Post	Pre< Post	n.s.
Emotional expression	Pre>Post	Pre>Post	Pre< Post	Pre< Post
Physical implication	n.s.	Pre>Post	Pre< Post	n.s.
Elaborated aggressiveness	Pre>Post	n.s.	n.s.	n.s.
Primary aggressiveness	n.s.	n.s.	n.s.	n.s.
Intellectualization	n.s.	Pre<Post	n.s.	n.s.
Depression	n.s.	Pre>Post	n.s.	n.s.
Anxiety	n.s.	Pre>Post	n.s.	n.s.
Narcissistic needs	n.s.	n.s.	n.s.	n.s.
Objectal needs	Pre>Post	n.s.	n.s.	n.s.
Conflicts with schoolmates	n.s.	n.s.	n.s.	n.s.
Conflicts with parents	n.s.	n.s.	n.s.	n.s.

The profile of the “underachievers” in the experimental forms has worsened over the course of the year: they are less creative, less productive, and less sensitive to emotional experience. Their scores on “elaborated aggressiveness” and “object needs” have also dropped, indicating an adverse evolution of emotional control, a refusal of commitment or sullenness.

The elevated level of anxiety recorded in the experimental “underachievers” at baseline has remained unchanged.

With the “underachievers” of the control forms, the rates of creativity, productivity, sensitivity to emotional expression and physical implication have also decreased, while the tendency to an intellectualised maintenance of distance has increased in comparison with the former protocols. On the other hand, the expres-

sion of depressive experience and anxiety has dropped in this group. In general, the protocols have become more banal and conformist.

Within the experimental forms, the protocols of the “normal achievers” have slightly improved regarding their sensitivity to emotional expression and physical implication. The other categories have not budged in any significant manner. This result is the more remarkable one, as with the “underachievers” of the same forms the protocols regarding different dimensions of creativity have worsened.

With the “normal achievers” of the comparison forms, there were no significant differences between the protocols established at the beginning and at the end of the school year.

Commentary: At the end of the year, the stories written by the highly gifted normal achievers were

of better quality, whereas those produced by the “underachievers” seemed to reflect their weaker capacities of emotional and pulsional control in the experimental classes and a more pronounced tendency to conformism in the control conditions.

c) Intergroup comparisons of the experimental subgroups: Psychometric Questionnaires (FAF and AFS) (table 3)

Table 3. Intergroup Comparisons at the Questionnaires; clinical subgroups; U Mann-Whitney Test

Variable	U Mann-Whitney	Bilateral Signif.	P	Direction of the Difference
AFS-PA	21,5	0.065	<10%	UA1>UA2
AFS-MA	5	0.002	<1%	UA1>UA2
FAF-OF	17,5	0.030	<5%	UA1<UA 2
FAF-OF	15	0.061	<10%	NA1<NA2
AFS-SU	65,5	0.081	<10%	UA1>NA1
FAF-F3	58	0.040	<5%	UA1>NA1
FAF-SIGM	64,5	0.077	<10%	UA1>NA1
AFS-MA	2,5	0.021	<5%	UA2>NA2
AFS-SU	5	0.064	<10%	UA2>NA2
FAF-F4	5,5	0.079	<10%	UA2>NA2

AFS-PA = Prüfungsangst, exam anxiety; AFS-MA = Allgemeine Angst, generalised anxiety; AFS-SU = Schulunlust, school aversion; AFS-SE = Soziale Erwünschtheit, tendencies to social conformism;

FAF-F1 = Spontane Aggressivität, spontaneous aggression; FAF-F2 = Reaktive Aggressivität, reactive aggression; FAF-F3 = Erregbarkeit, irritability; FAF-F4 = Selbstaggression, self-directed aggression; FAF-F5 = Aggressionshemmungen, inhibited aggression; FAF-OF = Offenheit, directness; FAF-SIGM = Veräusserlichte Aggressivität, externalised aggression.

Within the experimental forms, the differences between “underachievers” (UA1) and the controls (NA1) included higher irritability, an increased tendency to school aversion and externalised aggressiveness recorded in the former, thus supporting our general assumption of greater emotional instability, deficiencies of the pulsional and emotional control and less effective stress and anxiety adjustment strategies in these students. In the comparison forms, the “underachievers” (UA2) reported more obvious anxiety, more pronounced tendency to school aversion and internalised aggressiveness.

Commentary: The results are psychologically plausible: if in the forms of the pilot project there is a generally higher tendency to over-adapta-

tion, the anxiety of the highly gifted students failing at school is expressed in a less “mentalised” way [27], predisposing to irritability, somatisation and hetero-aggressive acts. In the comparison forms, the underachieving students’ suffering is quieter, their aggressiveness being rather self-directed.

2.2.2. Correlational Study on Delta Values (Spearman’s Rho)

In order to better understand the evolution that took place within the clinical group in the course of the year, we will present some correlations between selected variables.

- a) Changes in the Expressive Test and the Psychometric Scales (total clinical group).

Table 4. Matrix of the Rank Correlations between the Changes at the Expressive Test and the Psychometric Scales (total clinical group)

Variable 1	Variable 2	Spearman’s Rho	Significance Level
D Creativity	FAF-5 Inhibition of Aggression	-0.626	< 5%

D Productivity	FAF-5 Inhibition of Aggression	-0.599	< 5%
D Physical implication	FAF-5 Inhibition of Aggression	-0.587	< 5%
D Physical implication	FAF-O Directness	0.526	< 5%
D Elaborated aggressiveness	FAF-1 Spontaneous Aggression	-0.585	< 5%
D Depression	FAF-F5 Inhibition of Aggression	0.726	< 1%
D Anxiety	AFS-Social Desirability	-0.633	< 5%

Commentary: Increased expressiveness in the texts is positively linked to directness and negatively to inhibition of aggressiveness and school aversion in the clinical group.

b) Changes in the Expressive Test and the Psychometric Scales (total control group).

Table 5. Matrix of the Rank Correlations between the Changes at the Expressive Test and the Psychometric Scales (total control group)

Variable 1	Variable 2	Spearman's Rho	P
D Creativity	FAF-5 Inhibition of Aggression	-0.812	< 5%
D Productivity	AFS-Test Anxiety	0.899	< 5%
D Productivity	FAF-1 Spontaneous Aggression	0.899	< 5%
D Productivity	FAF-5 Inhibition of Aggression	-0.812	< 5%
D Emotional expression	FAF-5 Inhibition of Aggression	-0.928	< 1%
D Elaborated aggressiveness	AFS-Social Desirability	-0.853	< 5%
D Primary aggressiveness	AFS-Social Desirability	-0.836	< 5%
D Narcissistic needs	FAF-4 Self Aggression	-0.897	< 5%
D Objectal needs	AFS-Social Desirability	-0.940	< 1%
D Objectal needs	FAF-O Directness	0.955	< 1%

Commentary: These results are psychologically plausible and in line with our understanding of the inhibition of the “underachievers”. Indeed, the expression of an intra-psychic problem in the texts is linked to the heightened capaci-

ty of imaginary and symbolic elaboration of the tensions of everyday life, pointing to the resuming of the process of subjectivation.

2.2.3. Clinical Meaning of the Experimental Results

The concept of mentalization allowed creating meaning and understanding the ambiguities of the results: The highly gifted “underachievers” of the experimental classes did not benefit from the specific training in creativity, communication and teamwork, as opposed to the highly gifted “normal achievers”, as well as all the other students, who seemed to have benefited greatly from the interventions. It thus seems that, in middle adolescence, the inhibition of the “underachievers” is so deep that it cannot be overcome by purely educational means.

On the other hand, the “underachievers” of the control group do not spontaneously make up for their delay either. However, from the academic point of view, they cope a little better.

Even though, globally speaking, the deficits in school performance could not be made up for by the “underachievers” in the course of the year, their psychological development has been a little different depending on specific personality traits linked to the regulation of aggression and anxiety [28].

The results that emerge from the correlational study back the central assumption of the importance of mentalisation, affecting coping strategies, expressive capacities and school performance.

3. DISCUSSION AND CONCLUSION

As one’s intellectual potential is linked, in neurobiological terms, to the rate of transmission of

the neural influx and to the capacity of working memory [20], the situation of a certain number of gifted students seems paradoxical: while normally developed intellectual creativity (ie. divergent thinking) is a factor promoting academic success, this same factor seems to play a contrary role in the case of school performance of some highly able students [29, 30]. Indeed, divergent thinking can become a factor promoting academic difficulties if it is not channelled or combined with cognitive performance motivation and specific personality traits like endurance and self-control [31-33]. Therefore, the obvious pedagogic implications suggest the need to stimulate intrinsic motivation and even arouse a passion for an academic topic [34, 22, 35], but also offer a technical aid to those suffering from learning disabilities.

Other moderators of the relationship between intellectual potential and school results seem to be the sense of self-determination, the sense of mental competency and self-esteem [36, 37], as well as the sense of acceptance by the peer group [38-40]. The importance of self-determination is often underestimated by parents, who tend to guide and stimulate their children too much [41, 33].

Thus, Renzulli's model [8], having guided researchers and clinicians during decades, has to be revised. His model said that the actualisation of intellectual precocity depends on the interactions between three components of personality: exceptional intellectual capabilities, motivation and creativity, provided that the subject has adequate identification and stimulation possibilities. However, as we have highlighted above, current research results show that high intellectual potential can only be updated if the subject has sufficient self-control. In psychoanalytic terms, this refers to the strength of the Ego [42]. The consideration of this personality dimension allows a better understanding of school failure in gifted students who suffer from a deficiency of emotional and pulsional control.

Currently, negative results begin to be considered at the international research level and in the literature, as they can lay the ground for future research. In this case, they show that pedagogical measures are insufficient to help gifted pupils suffering from deep emotional.

One of the tracks for ongoing research emerging from this study was the assumption that

music psychotherapy combined with verbal psychotherapy focused on mentalisation [43] could on the one hand disinhibit creativity and intrinsic motivation, and on the other develop self-determination and the capacity of imaginary and symbolic elaboration, allowing to improve coping with the stress of everyday life and tolerance of frustrations. Positive results with individual music psychotherapy applied to highly gifted underachievers support this hypothesis [44].

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