

# Psychological Development

Perspectives Across the Life-Span

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## **23. FORMS OF GIFTEDNESS IN CHILDREN AND ADOLESCENTS: CURRENT RESULTS OF A LONGITUDINAL STUDY**

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Based on the results from a longitudinal study, differences between gifted and normal students in West Germany are discussed. The research is based on a multidimensional model of giftedness. The study design took both academic and nonacademic achievements into consideration and evaluated both relevant personality traits and socialization factors. Developmental aspects and achievement analyses were the focus of the study. Among other points, the stability of test and questionnaire results, the interdependencies between giftedness, non-cognitive personality traits, and achievements, the interactions between the development of intelligence, levels of intelligence, and family environments were evaluated.

### **INTRODUCTION**

Since 1985, the Federal Ministry for Education and Science in Bonn (FRG) has been sponsoring an educational-psychological research project with the title "Forms of Giftedness in Children and Adolescents – Identification, Development, and Achievement Analysis". This project is being carried out at the University of Munich (under the direction of Prof. K. Heller) and has been planned for a total of four years.

#### **Theoretical and Methodological Approach**

The Munich Study of Giftedness is based on a multidimensional giftedness concept. Performance behavior is considered as a product of the predictors giftedness, personality characteristics and environmental characteristics. The following factors illustrate this multidimensionality. Giftedness can emanate in intellectual, creative, social, musical and psychomotor domains. Academic and nonacademic achievements reflect the corresponding different areas. Non-cognitive personality traits and motivational factors contribute to giftedness, as do socialization processes arising in the family and school.

Starting with a large multiregional sample including six cohorts, data from gifted students have been collected at three measurement times in the years 1986 to 1988. Thus, the study is based on a longitudinal-sequential design.

The following results from the first phase (1986-1987) are available (cf. Heller, 1987):

(1) The five factors of the Munich Study of Giftedness (intelligence, creativity, psychomotor ability/practical intelligence, social competence, musical ability) were shown to be independent dimensions of giftedness. Thus the hypothesis of domain-specific forms of giftedness can be considered to have been confirmed.

(2) The instruments used to measure cognitive and non-cognitive (especially motivational) personality dimensions of the gifted as opposed to relevant conditions of the social learning environment are reliable even at extreme levels of giftedness. A particularly useful strategy was the employment of items for the gifted (in cognitive ability and achievement tests) that would normally be used for students who were one to three years older.

(3) There were clear differences between the highly gifted and normal students in each domain of giftedness and between the various types of giftedness. The intellectually (or academically) gifted were especially characterized by their good grades in school; these were not only better than the creative but also than the socially gifted, etc. The creative were better in artistic and literary areas and the socially gifted in social areas.

(4) Multiple or many-sided gifted were found relatively infrequently in the sample ( $N=1800$ ). If one views those students (at the ages from 6 to 16 or 18 years), however, who were both highly intellectually and creatively talented, they were superior to all of the other students in important performance areas. Thus, the designation of giftedness should not be based on single dimensions (e.g., with a single IQ score).

(5) Particularly capable students distinguish themselves from the others in the following characteristics: will to achieve, willingness to exert themselves, endurance, desire to learn, wish to research, inventive ability,



and belief in personal success. The meaningfulness of pure ability characteristics was apparent only in the extreme intellectual abilities possessed by very few individuals.

### Goals of the Second Phase of the Study

In the second longitudinal phase of the project phase, developmental aspects and school achievement analyses based on a special developmental model were the focus of the study. Essential goals of this second phase were five:

(1) The evaluation of the prognostic validity of instruments employed during the first (T1: 1986), second (T2: 1987), and third (T3: 1988) measurement periods for identifying highly gifted students (1st to 13th graders);

(2) Evaluation of the validity of the typological concept of giftedness and relationships between various types of giftedness and performance at different age levels;

(3) Evaluation of the effects of personality and environmental factors on the performance of gifted students based on a special causal model;

(4) Observation, description, analysis, and explanation of the developmental course of gifted children and adolescents (experimental and control group design) as it is related to changes in characteristics in cognitive and non-cognitive domains;

(5) Evaluation and analysis of the interaction between giftedness, achievement, personality, and environment over the course of time.

### METHOD

The most important sources of information, the research variables and the measurement instruments – each related to the five dimensions of the Munich Model of Giftedness – are summarized in Table 1.

The label *gifted* will be used to describe the top 6-10%, *highly gifted* for the top 3-5 percent and *extremely gifted* for the top 1-2 percent of the unselected population for that grade. The sample was divided at the median for the personal and environmental characteristics.

TABLE 1  
Information sources and measured variables  
(as described in this paper)

INFORMATION SOURCES		
VARIABLES	STUDENTS' PSYCHOMETRIC SCORES	TEACHER
Intellectual Dimension	Tests: - KFT (German CAT) - ZVT (Numbers Connection Test)	Teachers' Checklist: - T-Int Grades
Creativity Dimension	Tests: - VWT (Unusual Uses) - VKT (Verbal Creativity) Questionnaire: - GIFT (Finding Creative Talent)	Teachers' Checklist: - T-Cre
Social Competence Dimension	Questionnaire: - Social Competence	Teachers' Checklist: - T-SC
Psychomotoric Dimension		Teachers' Checklist: - T-PM
Art (Music) Dimension		Teachers' Checklist: - T-Mus
Non-cognitive Personal Characteristics	Questionnaires: - TfK (Thirst for Knowledge) - HS (Hope for Success) - FF (Fear of Failure) - Anxiety - Self Concept - Attribution - Learning Styles	
Environmental Characteristics	Questionnaires: Family Climate	

## RESULTS

### Stability and Predictive Validity of the Giftedness and Motivation Variables

Most of the stability coefficients for the giftedness and motivation variables are in the mid-range, i.e., between .5 and .7. In order to obtain information about the stability of the KFT scales (German version of the CAT) from both forms (since the students completed the parallel test form at T2), we calculated correlations between T1 and T3 for each form separately. These correlations are almost all higher than those that relate T1 and T2. This indicates good temporal stability in the KFT scales.

### Predictability of Domain-Specific Achievements by Various Forms of Giftedness

For the evaluation of this question, multiple correlation coefficients between different sets of predictors (Giftedness, Teachers' Checklist, and Motivation variables at T1) and achievement variables (measured at T2) as criteria were calculated. The statistics for academic achievements as well as all statistics including Teachers' Checklist variables were computed only for Gymnasium students in order not to contaminate them by pooling together different reference systems. The teachers judged their students on the basis of their experience with the respective school types.

Interpretation of these multiple correlations should be done carefully. Since there is quite a bit of collinearity between the predictors included, one must be careful not to overestimate the real interdependencies. The data do seem to fit well with the causal model of performance behavior advanced here. Thus older hypotheses that view the moulding of achievements as dependent on single characteristics, such as intelligence or creativity can be rejected.

### Identifying Different Types of Giftedness

Analyses which have been carried out to date indicate that various types of giftedness clusters exist but no clear clusters of high giftedness. This could be due to the fact that highly gifted have more individual or unusual patterns of giftedness and can only be grouped with difficulty.

### Interactions between Cognitive and Non-Cognitive Personality Characteristics, and Academic and Non-Academic Achievements

Two-way ANOVAs were used to obtain insight into the effects of intelligence and family characteristics on the following variables of achievement: average school grades (German, English, Math), activities in the domain of literature and art, in the social domain and in the science domain. In both grades, more intelligent students had higher average grades. No effects of family characteristics could be found apart from a negative influence from parents' control of activities in 8th grade students.

In grade 8, evidence of significant effect of intelligence on literary and artistic activities was observed. Family characteristics, such as cultural orientation and common structuring of leisure time activities, had a positive effect on students' activities in the domain of literature and arts. A family climate containing high achievement orientation tends to have a negative impact on these activities.

In the investigation of the influence of control, there was an interaction effect with intelligence: While highly intelligent students whose families exert less control are more active in the domain of literature, other students tend to develop more activities if they perceive their parents as more controlling.

Intelligence had a negative impact in the field of social activities in grade 10. In grade 8 there was no significant influence of intelligence, only the main effect of cultural orientation turned out to be significant. Concerning control, an interaction similar to that described above was found. For normal students, higher control had a positive influence on the social activities, the situation was reversed for the highly intelligent students.

Results on the relationship between non-cognitive personality traits and giftedness and achievement are exemplified by selected subgroups from grade 10; for more detail see Perleth, Schmidt, and Hofmann (1988).

In the investigation of the various groups of intelligence, the most obvious and consistent result was a higher academic self-concept among the gifted and highly gifted students. There were, however, no significant differences in general or non-academic self-concept. This result is in agreement with the results from a recent Dutch study of high school

students (Monks, van Baxtel, Roelofs, & Sanders, 1986). No differences were found on the variables of anxiety (test anxiety and worry regarding school grades), but there seemed to be a slight trend toward the more highly gifted students obtaining lower anxiety scores. This indicates a more stable thinking process in the gifted and highly gifted so that stressful situations in tests and school influence the quality of their thinking to a lesser extent as compared with normal students.

Interesting differences were also found between the investigated groups regarding learning styles. Whereas the normal and gifted students did not differ, the highly and extremely highly gifted had considerably lower scores on the scales *Planning and Organizing of Work* and *Control of Motivation* (according to Kuhl, 1983). It seems as if the highly and extremely gifted have no problems with homework and thus do not need such simple techniques for successful homework management. In addition, we found that gifted and highly gifted students preferred working alone and did not like to cooperate in groups of students from their class.

The above-mentioned differences in characteristics are less distinct in the group of creative students. The gifted underachievers differed greatly from the gifted achievers, whereby the differences all tended to be in the expected direction and thus confirm the picture of gifted underachievers found in the literature.

#### Interaction between the Development of Intelligence, Level of Intelligence and Family Characteristics

In grades 7 to 9 (T1-T3) there were no significant effects in the environmental scales (family climate) on the development of intelligence; they were neither significant for analysis of the individual differences in the developmental function nor for the analysis of individual differences in position.

In relation to academic self-concept and thirst for knowledge it was found that students with higher academic self-concept who scored higher in the Thirst for Knowledge Scale improved intellectually while the ones with lower scores obtained lower intelligence values. For the students with lower self-concept, the positions were nearly stable. Similar results were found in grade 9. Self-control and thirst for knowledge had no effect. A significant effect was found for perceived control in family on the development of intelligence showing that students with low perceived control scored higher at T3 compared with T1.

### The Influence of Intelligence and Motivation or Thirst for Knowledge on the Development of Achievement

In grade 7 neither effects of thirst for knowledge (TFK) or level of intelligence on the change in academic achievements (average school grades) and non-academic achievements were found. There was, however, a hint that students with higher TFK scores tended to be less active in the literary domain and also had somewhat worse school grades, while students who scored low in TFK increased their activities in arts and literature. This is plausible because TFK specifically addresses in the domain of science and technology. A similar pattern was seen in grade 9, apart from the result that intellectually gifted students improved their academic achievements while intellectually highly gifted deteriorated slightly. The intellectually gifted as well as intellectually extremely gifted were less socially active than the normal students.

When interpreting these results, one should not forget that there was only a delay of one year between the two measurement times. More significant results are expected when we complete the evaluation of all three measurement periods.

### CONCLUSIONS

The most important implications of these results can be summarized in six hypotheses, as interpreted below.

(1) Giftedness is a complex phenomenon. This fact needs to be taken into consideration in its conceptualization. Thus multidimensional constructs and possibly hierarchical models are to be promoted.

(2) In an analogous manner, satisfactory results are only to be expected when all available information sources are used, i.e., by using formal tests and informal instruments (e.g., teacher checklists or questionnaires).

(3) Many hypotheses about the cognitive, motivational, and social-emotional development of gifted children and adolescents offer interesting questions both for fundamental research and also for education and upbringing practices. Scientifically founded knowledge about the positive and negative socialization conditions form an essential basis for the preventative vs. interventive developmental aids or psychological counseling measures in conflict situations.

(4) Reliable predictions about academic and nonacademic achievement behavior in gifted youth not only make available appropriate prognostic models and appropriate decision strategies, but also provide empirically founded indicators of giftedness and usable criterion variables for achievement. This study has located numerous important sources of information and many diagnostic techniques have been tested.

(5) One must count gifted girls or physically handicapped gifted among the so-called high-risk groups, i.e., among those youth whose gifts may be overlooked or not recognized early. Such clients can only be recognized in a diagnosis-prognosis approach.

(6) Further studies directed toward the early identification and nurturance of highly gifted children are of great importance especially with regard to the design of appropriate learning environments.

#### CORRESPONDENCE

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