# Identification of Gifted and Talented Students

KURT A. HELLER[1]

## Abstract

After a brief introduction with four main questions related to identifying gifted and talented students, this article centres on the following topics: (1) multidimensional conceptions of giftedness as preconditions of suitable identification procedures, (2) functions and benefits vs. dangers of identification measures, (3) methodological problems and (4) practical recommendations for the identification of various groups of gifted and talented students.

Key words: Identification, Giftedness, Munich Model of Giftedness

[1] Prof. Dr. Kurt A. Heller, Department of Psychology, University of Munich, Leopoldstr. 13, 80802 München, Germany; E-mail: heller@edupsy.uni-muenchen.de

The necessity for the identification (and education) of gifted and talented students is often the subject of controversial discussions. There are several questions which provoke varying opinions from experts and lay persons alike. The following sections deal with four main topics of gifted identification and its related aspects:

1. *What* is to be identified? Questions concerning the relevant diagnostic variables arise, that are additional to conceptual problems.
2. *Why* or for what purposes is the identification attempted? In the literature, a substantial differentiation between *talent searches* (for special gifted programs or educational measures) and single case diagnostics (e.g. in the school counseling context and/or for intervention purposes) has been made. In both cases, benefits and dangers of identification procedures must be weighed.
3. *How* can gifted and talented students be identified? This question is directed at sources of diagnostic information and measurement instruments as well as at information processing and decision strategies concerning being gifted or not, the fit between individual (learning) needs and social (instructional) conditions of gifted education, etc. Identification and program evaluation aspects also are included in this section.
4. *When*, or more precisely at what point in time or developmental stage, should gifted children and talented youth be identified? Should single attempts or continuous diagnostic approaches be used? Voluntary or obligatory participation in talent searches (inside vs. outside of school)? These and other questions must be answered, especially with regard to the second question mentioned above.

Finally, practical recommendations for the identification of various groups of gifted and talented students will be discussed. For greater detail see Heller (1987, 1989, 1991/2000), Hany (1993), Mönks & Heller (1994), Feldhusen & Jarwan (2000), Perleth, Schatz & Mönks (2000), Sternberg & Subotnik (2000), Trost (2000), Sternberg & Grigorenko (2002), among others.

## Multidimensional Conceptions of Giftedness and Talent as Preconditions of Suitable Identifying Procedures

Our knowledge regarding giftedness and talent – both terms are used synonymously according to the recent literature (cf. Heller, Mönks, Sternberg & Subotnik, 2000/2002; Sternberg & Davidson, 2004) – is supplied by different research paradigms. Approaches that are particularly relevant to the identification of gifted or highly gifted students are based on the psychometric vs. the expert-novice paradigm. Whereas the *psychometric* (so-called status-diagnostic vs. dynamic or process-oriented) models are focused on the individual potential which should be identified for diagnostic or prognostic purposes, the *expert-novice* paradigm focuses more or less on personality (motivational and learning) and social-cultural conditions in which giftedness (intelligence) plays only a slight role. However, recent attempts have been made to combine both research paradigms in order to optimize the amount of insight into what we call giftedness or talent (cf. Perleth & Ziegler, 1997; Ziegler & Perleth, 1997;
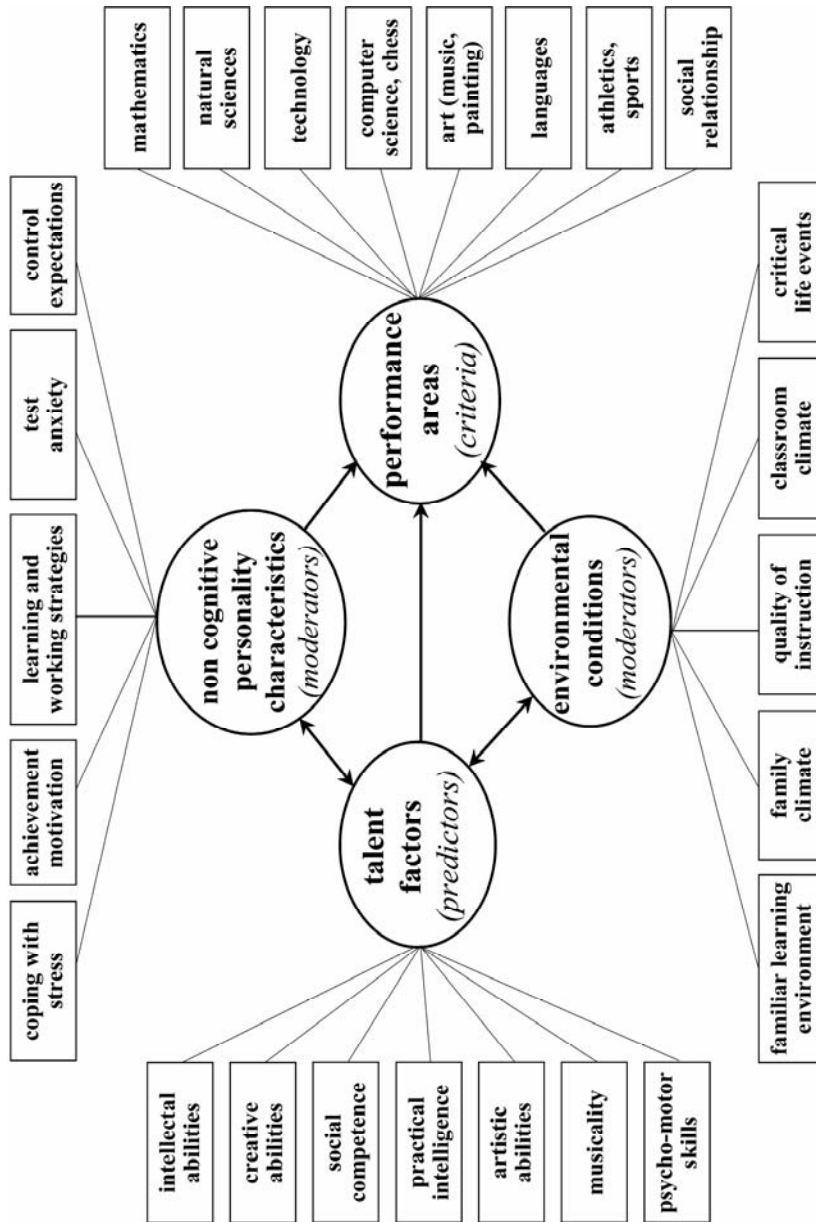
Figure 1:
The Munich Model of Giftedness (MMG) as an example of multidimensional, typological conceptions
(according to Heller et al. 1992, ²2001)

*Legend:*

**Talent factors (predictors)**

4 intelligence (language, mathematical, technical abilities, etc.)
4 creativity (language, mathematical, technical, artistic, etc.)
4 social competence
4 musicality
4 artistic abilities
4 psycho-motor skills
4 practical intelligence

**(Noncognitive) Personality characteristics (moderators)**

4 achievement motivation
4 hope for success vs. fear of failure
4 control expectations
4 thirst for knowledge
4 ability to deal well with stress (coping with stress)
4 self-concept (general, scholastic, of talent, etc.)

**Environmental conditions (moderators)**

4 home environmental stimulation ("creative" environment)
4 educational style
4 parental educational level
4 demands on performance made at home
4 social reactions to success and failure
4 number of siblings and sibling position
4 family climate
4 quality of instruction
4 school climate
4 critical life events
4 differentiated learning and instruction

**Performance areas (criteria variables)**

4 mathematics, computer science, etc.
4 natural sciences
4 technology, handicraft, trade, etc.
4 languages
4 music (musical-artistic area)
4 social activities, leadership, etc.
4 athletics/sports

Ziegler & Heller, 2000; Perleth, 2001; Heller, Perleth & Lim, 2004). Other – synthetic – approaches stem from Sternberg (2000, 2003).

For practical diagnostic purposes, psychometric (multidimensional) giftedness models still remain to be indispensable (see Lubinski 2004). As an example, the Munich Model of Giftedness (MMG) is presented in Figure 1. Here giftedness is conceptualized as a *multifactorized ability construct* within a network of non-cognitive (e.g. motivation, interests, self-concept, control expectations) and social moderators which are related to the giftedness factors (predictors) and the exceptional performance areas (criterion variables). For diagnostic or prognostic purposes, the differentiation between the three kinds of variables – predictors, moderators (or catalysts sensu Gagné, 2000), criteria – is of particular interest.

Furthermore, the MMG represents a *typological* model of giftedness or talent. In Figure 1, seven types or forms of gifts/talents are listed in the left row. Although these forms of giftedness are the most cited in the current literature, they do not represent all kinds of giftedness or talent. For a meta-theoretical overview see Ziegler & Heller (2000). In the last decade, the MMG has been validated in several national longitudinal and cross-cultural studies (cf. Heller, 2001, 2002; Perleth, 2001; Perleth & Heller, 1994; Heller & Perleth, 2004, 2005; Heller, Perleth & Lim, 2004).

## Functions and Benefits vs. Dangers of Identification Measures

The identification depends not only on the theoretical basis of the definition of giftedness/talent, but also on the purpose of this definition. Two main functions of identification could be differentiated: the talent search and the single case analysis in the diagnosis of giftedness.

The *talent search* focuses on the fit between the individual prerequisites for special gifted programs or educational measures and curriculum or instructional demands such as task difficulties and complexity of the learning subjects, available learning time, etc. The talent search is legitimized through the right of every individual to receive optimal nurturance of his/her talent development and the social demand on each individual to make an appropriate contribution to the society. Hence, a comprehensive and differentiated approach is an indispensable component for talent search.

*Single case analysis* in the diagnosis of giftedness, as the basis for (school) counseling and educational treatments, serves the purpose of providing information about prevention or intervention in individual behavior and performance problems, social conflicts, education and social problems in as far as giftedness can – directly or indirectly – be made responsible for them. Corresponding assumptions are to be confirmed diagnostically or repudiated before the planning and realization of rationally founded educational-psychological decisions, counseling or intervention measures take place. It has been adequately proved that a continual lack of challenge (due to giftedness not having been recognized), pressure to conformity (e.g. based on the fear of negative labeling effects), insecurity of adults in connection with their dealing with exceptionally gifted children and youth, and feelings of threat and envy could lead to behavior problems and conflicts between gifted individuals and their social environment.

It is frequently possible that ignorance of gifted individuals is more to blame than "evil" intentions. If expert estimations are correct that 20-30 % or more of the highly gifted individuals are not recognized as gifted, then it is easy to judge which omissions – at least in

relation to an individually appropriate nurturance of development – are caused by doing without identification of giftedness. This fear is especially valid for members of so-called high-risk groups mentioned below.

Even when one considers the methods of critical analyses (e.g. Czeschlik & Rost, 1988; Rost, 1993, 2000) in research literature available on psychosocial adaptation problems mentioned, it is impossible to overlook the numerous counseling situations that have to do with the development of giftedness and corresponding socialization problems (cf. Colangelo, 1997; Colangelo & Assouline, 2000; Feger, 1987; Feger & Prado, 1986, 1998; Freeman, 2000; Heller, 2005; Mönks, 1987; Silverman, 1993, 1997; Stapf, 2003; Webb, Meckstroth & Tolan, 2002).

With regard to the postulate of equal opportunity and the (justified) demand for individualized education, several problems concerning identification exist. Highly gifted students cannot – in contrast to some beliefs – always be easily identified. However, the number of unrecognized gifted students cannot be justified in our political or education systems. If one assumes the good will and intentions of all those involved in identifying gifted and talented students, the following circumstances should be considered to make identification difficult:

- perceptual distortions due to false assumptions and prejudices, observational errors (etc.) or even the lack of knowledge about how giftedness appears and the developmental conditions;
- recognition of "high risk groups", e.g. highly gifted students with behavior problems, gifted handicapped children and adolescents, highly gifted girls (especially in math and natural sciences), *gifted underachievers* (gifted students with low school performances; see Butler-Por, 1993; Peters, Grager-Loidl & Supplee, 2000; Ziegler, Dresel & Schober, 2000; Ziegler & Stöger, 2003), economically disadvantaged and minority gifted learners or gifted immigrant children and youth (see VanTassel-Baska's contribution to this special issue);
- unfavorable family and school socialization settings for the concerned students so that an identification attempt focused on achievement or product criteria has to fail, i.e. that the chances are extremely limited for recognizing special talents in any one area.

This list could go on forever. It is becoming clear that it is more important to realize the weight of these arguments rather than to have a very complete list of these many proven facts. This does not mean that special rights are called for, just equal rights for everyone including the gifted and talented persons.

What about the suspected *dangers* and disadvantages in connection with the identification of giftedness and talent? In this area there are many more uncontrolled results and unconfirmed hypotheses than there are confirmed recognitions. For example, the *labeling problem* is continually mentioned. Empirical studies (e.g. Robinson, 1986, 1993; Robinson & Clinkenbeard, 1998) have only reported the feared negative effects in a small number of cases which could have to do with identification. Interestingly enough, according to questionnaire-findings, the greatest reservations about identification attempts are not observed on the part of the gifted or their parents, but rather much more from psychologists and counselors and – in part – of non-gifted siblings. Most of the classmates also reacted as the parents,

positively to the label "gifted". Although the opinions from German and American teachers questioned were different from one another, both tended to be positive.

The following dangers are usually associated with labeling problems: social isolation, development of egocentric attitudes and behaviors, endangering or disturbing the personality development and self-concept through extreme achievement pressures or too much responsibility, etc. Certainly, these dangers must be kept in mind during the identification process and if necessary, be accompanied by counseling measures. If one is aware of the consequences of making no identification attempts, then almost everything speaks for the first alternative: for the exertion of identifying the gifted and talented children and youth as completely as possible so that assistance in their education and upbringing is available at the same time (cf. Heller, Reimann & Senfter, 2005).

Even if not all gifted students will need such help, it is nevertheless irresponsible to leave the estimated half of the especially gifted – including their parents and teachers – alone with their personal and social problems. The range of counseling and problem cases reaches from asynchrony between acceleration of the intelligence development and "immature" (appropriate to the chronological age) feelings, behavior problems due to permanent lack of challenge, social isolation because of lacking contact possibilities with gifted peers and problems specific to gifted girls (especially in math and the sciences) due to role expectations and educational attitudes, indifferent or even rejecting behaviors by parents or siblings and teachers up to psychiatric risks, e.g. anorexia nervosa (cf. Baldwin, Vialle & Clarke, 2000; Detzner & Schmidt, 1986; Heller & Ziegler, 1996; Kaufmann & Castellanos, 2000; Terrassier, 1985; Yewchuk & Lupart, 2000). A directed talent nurturance is in many cases hardly possible without identification, which provides definite fundamental diagnostic information about the concerned problem.

All in all, the weightier arguments are clearly on the side of diagnosing/identifying giftedness and talent during childhood and adolescence. However, prophylactic measures for the prevention of undesirable or even harmful side-effects should be considered as well as different cognitive and social/emotional needs of the gifted students (cf. Adams-Byers, Whitsell & Moon, 2004). See also Schofield & Hotulainen in this special issue.

## Methodological Problems of Identification

Questions of methodology concerning identification include various aspects, such as problems with the definition of relevant indicators, sources of diagnostic information or measurement problems. Furthermore, diagnostic decision strategies with respect to specific sources of error, effectivity and economy of the selection of talented students for appropriate gifted programs, the decision to use so-called static diagnostic approaches vs. dynamic or process diagnostic approaches, etc. are also included.

According to the currently more favored multidimensional concepts of giftedness and talent, the following behavioral characteristics are considered to be *indicators* of a special talent in childhood and adolescence: cognitive aptitudes like intellectual precocity, quick comprehension and high-speed of learning, being quick to pick up concepts, often ahead of the usual time (needed by the age-mates), distinct curiosity, a large vocabulary for ones age, creative (original) ideas and methods to solve complex problems, the individual challenging tasks or questions, eminent cognitive abilities to think convergently (as indicators of intelligence) and

divergently (as indicators of creativity sensu Guilford), sensitivity for problems, spontaneous inclination toward challenging and difficult tasks and thought problems, distinctive meta-cognitive competencies, etc. With respect to the MMG (see Figure 1 above), these cognitive variables serve as *predictors*.

In the procedure of assessing the influence of non-cognitive personality factors, as well as socio-cultural conditions of the individual's environment, the following items should be considered as *moderators*: intrinsic achievement motivation and striving for success, willing-ness to take risks or persistence and striving for perfection, preference for independent learn-ing style, coping with stress, test anxiety or control expectations, along with socio-emotional climate in the family and at school, educating and instructional styles, reactions of peers, siblings, parents and teachers to success and failure of gifted students, quality of stimulation and expectation pressure of the social environment, etc.

In addition, according to the type of giftedness, performance variables related to more or less specific areas like mathematics, natural sciences, technology or computer science, lan-guages, music, arts, etc. are named *criteria* in the diagnosis-prognosis paradigm.

*Sources of diagnostic information* include *l*ife, *q*uestionnaire, and *t*est data (according to Cattell, 1965). Hence, diagnostic variables and their operationalization, i.e. the measurement instruments, behavioral observations and observational techniques respectively (*l*-data), diagnostic interviews and questionnaires including self-, parent- and teacher-nominations or checklists (*q*-data) as well as standardized tests (*t*-data). If necessary, the named instruments can be supplemented by *biographical* analyses or something similar. For the identification of highly gifted youth within the talent search and single case diagnosis, one usually needs not only an adequately differentiated set of appropriate instruments, but also has to consider the scale niveau and the test quality characteristics, such as objectivity, reliability, and validity. *Ceiling effects* have to be dealt with when one employs normed tests. This means that the concerned test does not differentiate adequately in the extreme upper region of the scale. Therefore, special test scales for the identification of highly gifted – especially the ablest – students are needed; see, for example, the Triarchic Abilities Test (Level H) by Sternberg (1993) or the Munich High Ability Test Battery (MHBT) by Heller & Perleth (2005).

A further methodological problem is the *breadth-fidelity dilemma* encountered in person-nel decisions (cf. Cronbach & Gleser, 1965). To cope with this dilemma, the identification procedure involves several steps: First, a general screening takes place. This means that a less exact, but wider, range of factors and instruments is included, e.g. checklists – often in combination with rating scales. In the following Tables 1 and 2, examples of such checklists with respect to intellectual giftedness and creative talent from the MHBT are represented. For further checklists, assessing such aspects as social competence, musicality, and psycho-motor skills, please refer to the MHBT by Heller & Perleth (2005). With their aid, teachers or edu-cators nominate a certain number of children or youth who fit the listed talent characteristics. In the next step, more precise tests are employed for the determination of the individual talent dimensions. Finally, individual and social moderator variables are collected which are rele-vant to the training gifted program or special educational measures; see the *sequential strat-egy model* in Figure 2 below. The final selection is thus more accurate than the screening which helps to reduce the danger of not recognizing talents.

Such selection decisions generally include risks. The risk of type I or *alpha error* consists of a person being identified as (highly) gifted when he or she is, in fact, not (highly) gifted.

Table 1: Teacher's Checklist: Intellectual Giftedness

| ID or Name | Ratings | | | To assess this type of giftedness, you may refer to the following dimensions (they need not be all present; it is sufficient if the student excels in some of them): |
|---|---|---|---|---|
| 1 | 1 | 2 | 3 | |
| 2 | 1 | 2 | 3 | |
| 3 | 1 | 2 | 3 | ∉ Logical / analytical thinking |
| 4 | 1 | 2 | 3 | ∉ Abstract thinking |
| 5 | 1 | 2 | 3 | ∉ Mathematical thinking |
| 6 | 1 | 2 | 3 | ∉ Scientific / technical thinking |
| 7 | 1 | 2 | 3 | ∉ Language skills (rich vocabulary, fluency of expression, talent for foreign languages) |
| 8 | 1 | 2 | 3 | ∉ Learning ability (quick understanding, retentive memory, accurate reproduction, active learning) |
| 9 | 1 | 2 | 3 | |
| 10 | 1 | 2 | 3 | ∉ Powers of deduction, combination etc. |
| 11 | 1 | 2 | 3 | ∉ Broad knowledge |
| 12 | 1 | 2 | 3 | ∉ Consolidated special knowledge in one or more domains. |
| 13 | 1 | 2 | 3 | |
| 14 | 1 | 2 | 3 | |
| 15 | 1 | 2 | 3 | Please consider now which of the students in your class apply here, and cross the appropriate code next to their class numbers (ID)! |
| 16 | 1 | 2 | 3 | |
| 17 | 1 | 2 | 3 | |
| 18 | 1 | 2 | 3 | |
| 19 | 1 | 2 | 3 | Scoring system: |
| 20 | 1 | 2 | 3 | 1 = top 10 % |
| 21 | 1 | 2 | 3 | 2 = top 20 % |
| 22 | 1 | 2 | 3 | 3 = below top 20 % |
| 23 | 1 | 2 | 3 | |
| 24 | 1 | 2 | 3 | |
| 25 | 1 | 2 | 3 | |
| 26 | 1 | 2 | 3 | |
| 27 | 1 | 2 | 3 | |
| 28 | 1 | 2 | 3 | |
| 29 | 1 | 2 | 3 | |
| 30 | 1 | 2 | 3 | |

Table 2: Teacher's Checklist: Creative Giftedness

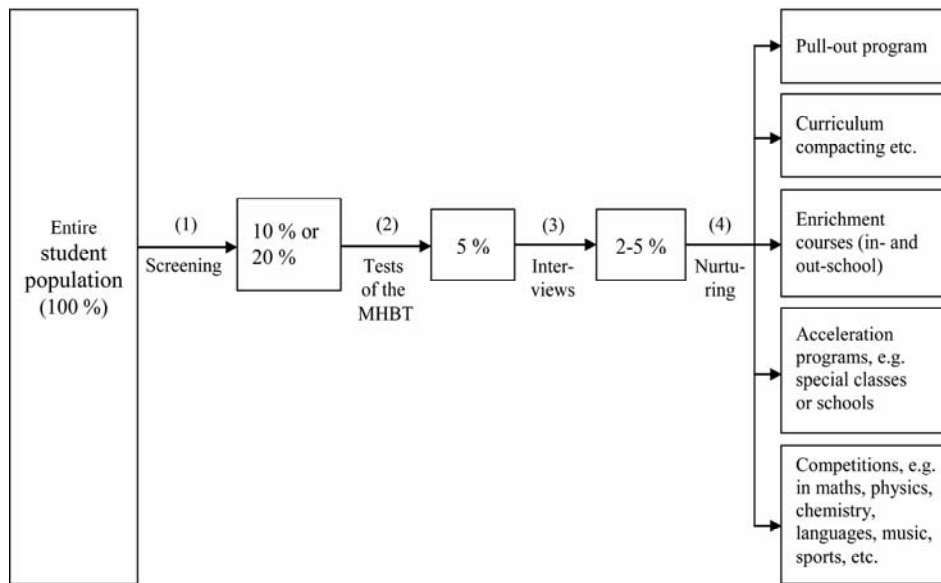| ID or Name | Ratings | | | To assess this type of giftedness, you may refer to the following dimensions (they need not be all present; it is sufficient if the student excels in some of them): |
|---|---|---|---|---|
| 1 | 1 | 2 | 3 | |
| 2 | 1 | 2 | 3 | |
| 3 | 1 | 2 | 3 | ∉ Curiosity, quest for knowledge |
| 4 | 1 | 2 | 3 | ∉ Imagination, ability to think in alternatives |
| 5 | 1 | 2 | 3 | ∉ Creative and inventive thinking |
| 6 | 1 | 2 | 3 | ∉ Originality, search for extraordinary problem/task solutions |
| 7 | 1 | 2 | 3 | ∉ Flexible thinking, spiritual agility, ability to con- |
| 8 | 1 | 2 | 3 | sider a problem from various points of view |
| 9 | 1 | 2 | 3 | ∉ Self-sufficiency, independence of thinking and |
| 10 | 1 | 2 | 3 | opinion |
| 11 | 1 | 2 | 3 | ∉ Interest-oriented, independent solving of prob- |
| 12 | 1 | 2 | 3 | lems |
| 13 | 1 | 2 | 3 | ∉ Multiplicity of interests |
| 14 | 1 | 2 | 3 | ∉ Stability of interests |
| 15 | 1 | 2 | 3 | |
| 16 | 1 | 2 | 3 | |
| 17 | 1 | 2 | 3 | Please consider now which of the students in your class apply here, and cross the appropriate code next to their class numbers (ID)! |
| 18 | 1 | 2 | 3 | |
| 19 | 1 | 2 | 3 | |
| 20 | 1 | 2 | 3 | Scoring system: |
| 21 | 1 | 2 | 3 | 1 = top 10 % |
| 22 | 1 | 2 | 3 | 2 = top 20 % |
| 23 | 1 | 2 | 3 | 3 = below top 20 % |
| 24 | 1 | 2 | 3 | |
| 25 | 1 | 2 | 3 | |
| 26 | 1 | 2 | 3 | |
| 27 | 1 | 2 | 3 | |
| 28 | 1 | 2 | 3 | |
| 29 | 1 | 2 | 3 | |
| 30 | 1 | 2 | 3 | |

Figure 2:
A sequential strategy model for the identification of exceptionally gifted students at school
level according to Heller (2000, p. 252)

*Legend:*

(1) = Nomination of the 10-20 % class leaders with respect to the different dimensions of giftedness, e.g. through teacher checklists; see Table 1 and/or Table 2 above.

(2) = (Field-specific) tests of giftedness for the selected 10 % or 20 % and/or differentiated teacher ratings (cf. checklists).

(3) = (If necessary), selection interviews for further selection.

(4) = Assignment to various nurturing programs, e.g. curriculum compacting, pull-out-program, enrichment courses, special classes or special schools for highly gifted and talented students in math and/or sciences, etc.

The risk of type II or *beta error* is manifested when a person who is (highly) gifted is not identified as such. The first type of error can be reduced by increasing, the second by decreasing values, e.g. IQ- or T-cut-offs (threshold model). Unfortunately, it is not possible to reduce the risk of both types of errors at the same time. Institutional (e.g. capacity of the gifted program) "interests" usually dictate that the reduction of the alpha error's risk takes place. However, it is in the individual's best "interests" to minimize the risk of the beta error. Hence, this strategy ought to be favored in the identification (talent search), whereby one can employ *valid* instruments and the described *successive* decision procedure to further reduce beta errors. Regarding this topic further, see the articles by Ziegler & Stöger and Pyryt in this special issue.

The quality of the selection strategy mentioned above is related to its effectivity and economy or efficiency. The *effectivity* can be defined here as percentage of the (truly) gifted

already determined in the screening phase (exhausting quota according to Pegnato & Birch, 1959; see Pyryt in this special issue). It is the more important of the mentioned criteria in identifying as many of the gifted as possible. The *efficiency* (economy) is determined by the percentage of the actual gifted in the screening quota. This criterion is thus a measure for the effort necessary for the total identification process. When trying to find all (highly) gifted persons, it is best to set one's priorities on the first criterion (effectivity).

Special questions arising in the identification of gifted children and adolescents from so-called high-risk groups as well as further methodological problems are discussed by Feger (1987), Hany (1987, 1993, 2001), Feldhusen & Jarwan (2000), Kanevsky (2000), Perleth et al. (2000), Sternberg & Subotnik (2000), Perleth (2001a/b), Heller (2002, 2005).

While traditional *psychometric* (trait-oriented or so-called status test) diagnostics are indispensable in the identification of worthy or needy gifted children and youth, in the *process-oriented* or dynamic testing approaches one hopes for important discoveries about the type of learning and thought processes used by (highly) gifted students. Corresponding models primarily aim at proving surmised qualitative differences between gifted and non-gifted groups, especially with regard to information processing during the solving of difficult, complex problems. In contrast to the restrictive problem-solving situation of many skill-based tests (in the psychometric paradigm) which is seen as disadvantageous, open and less structured tasks are attempted. Such tasks, especially when they are reproduced in the experimental design, should allow not only for product analyses (as is customary in the psychometric tradition), but should also make process and causal analyses possible. Undoubtedly, this is a desiderata regarding – for example – the measurement of *creative production* (see Urban's article in this special issue). Beyond this, one hopes for insights into those learning and thought processes that are responsible for the development of expertise, beneficial vs. inhibiting conditions in the development and socialization of gifted and talented students, and also information about provisions necessary for the furtherance of development of its efficiency (cf. Facaoaru & Bittner, 1987; Klix, 1983; Waldmann & Weinert, 1990; Weinert & Waldmann, 1985).

However, one should not overlook a limitation of this new test diagnostic procedure: its validation, which is not yet sufficient in most cases. It is possible to research without empirical proof of validity, though not in the practice of gifted identification. This is the most important methodological postulate (Jäger, 1987).

*When should (highly) gifted children be identified?* This question includes two aspects which are expressed in the following alternatives: 1) Identification at the preschool or elementary school age, i.e. identification as early as possible? 2) Sporadic or continual identification? Another question closely tied to these is 3) whether the identification should proceed in a voluntary or obligatory fashion (through the education system).

Considerations which are directed at optimizing individual socialization and education processes speak for the earliest possible identification (Lewis & Louis, 1991; Urban, 1992; Robinson, 1993; Feger & Prado, 1998; Stapf, 2003). This affects not only cognitive, but also motivational and social-emotional areas of the personality development. Correspondingly, Lehwald (1986), who emphasizes early identification, stated the following: "The most important thing here is a certain decision, so that the child's optimal nurturance and development can take place. The nurturance of giftedness in a larger sense without adequate diagnostic information about the status and prognosis of personality development is not possible. Process-diagnostically determined biographical data opens the way for determining the individual developmental course of gifted children and deciding upon concrete educational measures for

the individual case. Early prognoses aid not only the child psychologist but are also indispensible to the early childhood educator" (1986, p. 161) – translated by the author. In recent years, neuro-biologists also plead for early identification (e.g. Singer, 1999).

Other educational and developmental psychologists (e.g. Weinert, 1992) are more skeptical and stress that all preschool children and students at primary (and secondary) school level must be optimally nurtured, i.e. provided with a rich, stimulating learning environment in the family and school settings, also – of course – the (highly) gifted. In my opinion, this postulate is true, but does it exclude the arguments for early identification? For an overview see Perleth et al. (2000).

In the discussion about early identification, methodological problems must also be considered. Difficulties in early identification stem from the lack of reliable and practical (for parents as well as teachers) criteria for the identification of highly gifted children. Also, inadequate knowledge about the problem-solving processes and their development, as they are specific to the gifted, is often an obstacle. The improvement of this background knowledge is an essential prerequisite for the construction of better diagnostic instruments, or more complete "intelligence diagnosis" on the experimental design (cf. Klix, 1983). The process diagnostic approaches discussed above are attempts in this direction, as are sequential decision strategies as well. Above and beyond this, such diagnostic instruments need to measure not only *inter*individual differences, but also *intra*individual progress regarding formal problem-solving and learning competencies.

Objections which are directed at the limited reliability of intelligence tests in preschool or early school groups are less sound. According to Casey & Quisenberry (1982) – also see Robinson & Robinson (1992), Perleth et al. (2000) or Stapf (2003) – the results in the upper areas of intelligence tests are already relatively reliable in preschool ages so that an early identification of giftedness could provide important information for individual nurturance of the gifted (if ceiling effects can be avoided). More serious are the reservations of many educators and preschool pedagogues about the realization chances of early diagnostic measures. Sometimes, however, the unprejudiced observers' suspicions that are raised, those ideological motives and not factually grounded arguments, are guiding the discussion. How else can one explain that parents of gifted children often present quite different problems, e.g. danger of lack of challenge, helplessness, regarding possibilities for appropriate stimulation and challenge? Yet this points out even more that for directed aid or prophylactic measures the available knowledge about positive and negative developmental conditions of gifted children and adolescents is often inadequate. Ideological mind-sets will hardly change this situation, to say nothing of dealing with the helplessness. The most necessary thing at this point is developmental and educational-psychological research, which would also benefit the gifted identification possibilities. There is certainly no danger in the foreseeable future of making a "final selection" at the preschool or elementary school age.

The question of when identification attempts should begin loses its force when one decides on *continual* diagnosis/prognosis which accompanies personality development. This would be better for the diagnosis of chronological developmental advances *and* for identifying individual uniqueness. At the same time, this makes the nurturance of giftedness and talent or – more inclusively – personality in the sense of formative evaluation possible. One important educational goal in the nurturance of giftedness is the development of a realistic self-concept. In this way, misdiagnoses of giftedness can be recognized early so that a continuous adjustment to the individual's needs of practical support measures is possible. It can

be a disadvantage to have to go to so much effort; this must be kept in reasonable relation to the gain in information for the nurturance of the gifted children.

Finally, each individual's right to free choice, including that of the gifted person, must be respected. The principle of voluntary participation, i.e. the individual decision about taking advantage of identification measures available to the gifted, cannot be allowed to deteriorate into an individual incapacitation. There seems to be, at least in Western democracies, general consensus on this point. A limitation of this right can only be derived from the educational responsibility for individually optimal socialization chances – true for *all* young people. In this light, the question of the individual's right to free choice is not a problem specific to the gifted children and youth.

## Summarizing Conclusions

There are a number of problems intertwined with the identification of giftedness and talent, e.g. questions concerning the conceptualization of high ability or giftedness constructs, methodological problems of identification like measurement and procedural questions, decision paradigms, validation and – last but not least – evaluation problems. In order to solve them, not only is differential and diagnostic psychology called upon, but one also expects important contributions from the fields of developmental and educational psychology, social and clinical psychology, and (empirical) education sciences. Without claiming to be a complete list, the necessity of an interdisciplinary cooperative problem-oriented effort should be emphasized. From this we can expect decisive progress to be made in the near future. The following *research tasks* seem to be the most pressing:

1. The elaboration and increased precision of differential diagnostic instruments for determining various forms of giftedness and talent. This should include both psychometric (skill-/trait-based) and cognitive psychological approaches (from experimental diagnostics). The argument of whether the support of giftedness should be more related to general cognitive competencies and general thought processes or to specific skills and abilities (knowledge competencies) naturally influences the operationalism of the giftedness/talent constructs. If one concurs with the investment theory by Cattell (1971), according to which Cattell's (1963) "crystallized" intelligence (in this instance, knowledge acquisition) benefits from the Cattell's "fluid" intelligence (in this instance, general thought potential) or is – partially – dependent on it, the solution of this problem is only to be found in the inclusion of *both* approaches; for greater detail, see Heller & Hany (1996).

2. With regard to optimal identification results, one should give preference to process diagnostic over so-called status diagnostic methods. Naturally, one is confronted with the previously discussed unsolved problem of actually obtaining processes analyses and not only product analysis results. The process-oriented giftedness diagnosis is in an analogous – and just as often dissatisfying – situation as learning or dynamic test diagnostics (cf. Guthke, 1992; Kanevsky, 2000; Sternberg & Grigorenko, 2002). Developmental diagnostics are no less deficient (cf. Stapf, 2003).

   Since gifted individuals exhibit various characteristics both in the developmental process and in the achievement behavior, these must all be considered in the identifi-

cation of gifted children and youth. Multivariate classificatory approaches to the determination of specific configurations of giftedness and talent (using *test profiles*, etc.) are supplemented by idiographic methods, e.g. biographical analyses (cf. Bloom, 1985). A systematic determination of counseling needs specific to the gifted as a basis for prevention and intervention is just desirable as the development and testing of appropriate continuing education measures for counselors and school-psychologists (for greater detail see Heller, 2005).

3. The greatest challenge probably lies in the establishment of *interaction diagnostics* and its validation (cf. Mönks, 1992). In connection with this, additional evaluation problems and – indirectly – conceptualizing problems are virulent. It would appear that the topic of giftedness or talent is being rediscovered as a research task (cf. Ziegler & Heller, 2000; Sternberg, 2000, 2003).

## Practical Recommendations

Despite conceptual and methodological problems that are as of yet unsolved, a few recommendations for the better practice of identification may be formulated here. Not only is the utility aspect to be included in the following discussion, but also the possible disadvantages and consequences of doing without diagnostic aids.

1. In single-case diagnoses as well as talent searches, a *step-by-step* procedure is most effective. This best meets (highly) gifted individual needs. A sequential decision strategy reduces the danger of incorrect identification outcomes by minimizing the bandwidth fidelity dilemma. Since the most recent theories of giftedness and talent have almost always evolved from complex or hierarchical constructs, *multidimensional* measurement methods and *classificatory* approaches (to data analysis) are to be recommended over traditional one-dimensional (IQ cut-off scores) methods. For that purpose, elaborated test profiles of (various groups) gifted and talented students are needed (as provided e.g. by the MHBT by Heller & Perleth, 2005). Another example is the Revolving Door Identification Model (RDIM) by Renzulli (1984). To develop a talent pool, Renzulli offers a six step model for identifying and nurturing gifted students. The gifted students can then be supported individually, based on needs and wants, in voluntary work or study groups (also see MacRae & Lupart, 1991). In a similar way, Ziegler & Stöger developed the five step model ENTER for the identification, which is presented below in this special issue. Besides these status-diagnostic (psychometric) approaches following the learn-test or dynamic test paradigm, one proceeds later in a more process-diagnostic manner. Analogously, one would attempt a step-by-step confirmation of the identification results in the single-case evaluation, whereby the uniqueness of the individual must be the center of the identification process. Therefore, detailed *biographical analysis* should always be included if possible.

   Despite their measurement inadequacies, one would not want to do without informal diagnostic instruments such as parent and teacher nominations or checklists (see Neber's article in this special issue), observational techniques or diagnostic interviews. In individual cases, self-nominations and contests can play a further part

with older adolescents, although the self-selection limits many diagnostic procedures (see Gagné, 1989; Gagné, Bégin & Talbot, 1993). Combined with formal methods, e.g. cognitive ability tests, they can provide important supplementary diagnostic information (cf. Campbell, Wagner & Walberg, 2000).

One must be careful during the selection of ability and – generally – of achievement *normed* tests that they do not produce ceiling effects, i.e. failing to sufficiently differentiate adequately in the upper ranges of the concerned scales. Multifactorized tests are usually more appropriate for the identification of (highly) gifted and talented students than (normed) tests of general intelligence, etc.

2. If one contrasts the advantages of gifted identification with the possible disadvantages, then the advantages clearly outweigh the disadvantages. Neither the feared labeling effects (Perleth et al., 2000; Endepohls-Ulpe, 2004; Robinson, 1986, 1993) nor unusual personality or social conflicts from gifted identification measures have been proven. The fact that such undesireable effects can occasionally occur should lead to their being dealt with by accompanying counseling measures, and not by doing without (useful) diagnostic information (also see Lehwald, 1986, 1987).

One also finds the results of *identification omissions* on the education and upbringing or personality development of the gifted children and youth in the literature, which are felt to be much more serious. Gifted identification is frequently an essential element of individual development chances. Feger (1987), Mönks (1987, 1992), Borland & Wright (2000) or Stapf (2003) suspect that many gifted children are presently not being recognized. Primarily these are the so-called high-risk groups mentioned above; for greater detail see Van Tassel-Baska et al. in this special issue. Thus, in many instances, a continual identification or diagnostic process which begins at an early age is essential as a prophylactic measure.

3. The success of such identification attempts depends on *general conditions and educational provisions*. The preparedness of parents and teachers, school counselors and psychologists, to deal with the tasks of identifying and nurturing the gifted without fear or prejudice, is a main concern. This challenge can be everything except easy. The identification or diagnosis of giftedness and talent fulfills not only an important function with regard to an optimal personality development of gifted and talented youth in the social (family and school) settings. It also serves as a prevention and intervention measure in crisis situations.

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