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Identification based on ENTER within the Conceptual Frame of the Actiotope Model of Giftedness

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Abstract

In this contribution ENTER will be used as a basis to determine which traits can be used to characterize identifications within the conceptual framework of the Actiotope Model of Giftedness. In contrast to alternative conceptions of giftedness this model employs a systemic approach which does not emphasize the identification of persons, but rather the identification of a learning path which leads to excellence. Following a brief overview of ENTER and the Actiotope Model of Giftedness, information pertinent for each step of ENTER will be specified. In conclusion a critical discussion of practical applications based on ENTER will be conducted.

Key words: Identification, Giftedness, ENTER, Actiotope

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ENTER is a model which assists in both the identification of excellence as well as the identification of milestones attained along the path to excellence. The name is an acronym, comprised of the first letters in the terms *Explore*, *Narrow*, *Test*, *Evaluate* and *Review.* In the first presentation of their model Ziegler and Stöger (2003a, 2003b) pointed out that the model is to be considered as a theoretically independent identification model which must be combined with a conception of giftedness. The authors provided an example in the form of the *Model of Triadic Interdependence* by Mönks (1995). In this chapter we will demonstrate how identification can be conducted with ENTER on the basis of our own theoretical approach – the *Actiotope Model of Giftedness* (Ziegler, 2004). We will do this in the following manner: First we will present (a) a short overview of ENTER. Following this, we will present (b) the Actiotope Model of Giftedness, whereby these passages have the single goal of providing enough information about the model so that (c) subsequent specification for the identification of excellence can be made within the framework of ENTER. In conclusion we will (d) critically discuss possible applications of the model in practice.

1. The ENTER Model – a brief overview

The planning of an identification is dependent on three specific conditions (see Figure 1): (a) the theoretical model chosen, (b) the resources available to the investigative team, as well as (c) the purpose or goal of the identification. Only when these three parameters have been determined can the specific methodology correspondent to the five diagnostic steps of ENTER be determined.

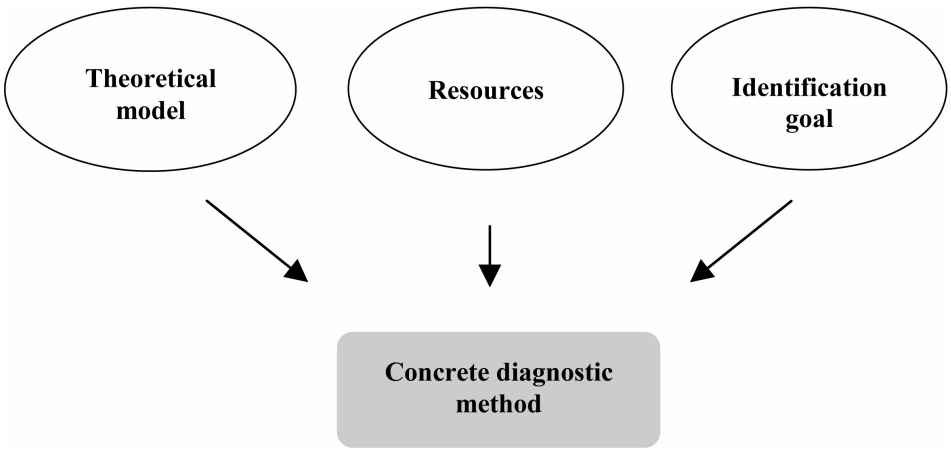

Figure 1:
Boundary conditions of identification

1.1 Boundary Conditions of the Identification

In that the *theoretical model* of giftedness in the case at hand is predetermined by the topic of this contribution, we will not make further deliberations on this boundary condition at this point, but rather following the presentation of the Actiotope Model of Giftedness.

In practice, concrete diagnostic opportunities are often limited by the *resources* available. Adverse conditions in terms of resources can certainly lead to infringements on the quality of the identification, to the point that the efforts undertaken in the identification process could prove to be worthless. However, for the case of simplicity, we will assume that resources are unlimited, in other words we are provided with adequate levels of:

- investigative competence (e.g., training, experience),
- time to conduct the investigation,
- access to information (for example, teachers are available for interviews),
- material resources (adequate investigative rooms and offices, diagnostic material, etc.).

The actual identification is particularly dependent on the goal of the identification, since this determines what types of and how much information is to be collected. For example, if the goal is to determine whether a child can skip a grade, then academic learning potential should be urgently appraised. On the other hand, if the goal is to determine whether a child can attain a level of excellence in the field of music, then learning competencies in the artistic area would be the focus of this process.

Variation among identification goals is extremely high. What one can accept as an identification goal is actually not a question which can be answered diagnostically. This is because identification is not an end in itself, but rather provides information for a specific purpose. Nevertheless, an identification model must be in the position to – and ENTER meets this challenge – adapt to and satisfy the demands made by the diagnostic process. Usually one of the following requests are to be met (Adams & Moore, 2003; Griggs, 1984; Heller, Mönks, Sternberg, & Subotnik, 2000; Kerr, 1986, 1991; Khatena, 1983; Lupowski-Shoplik & Swiatek, 1999; Pleiss, 2003; Super, 1987): talent searches, individual counseling, educational and scholastic counseling, career counseling, guidance to special programs for the gifted, recruiting for participation in scientific investigations.

1. 2 The diagnostic steps of ENTER

ENTER is composed of five diagnostic steps, which may overlap over the course of the identification process. The first three steps are basically concerned with the collection of specific types of data. In contrast to alternative identification models, the aim is not to classify individuals as gifted. The goal here is much more concerned with determining a *learning path* for an individual. The fourth and fifth steps are dedicated to the verification of the validity of the identification (step 4) and the identification model (step 5). The inclusion of these steps serves to guarantee a permanent improvement of the identification process.

In the presentation of the five steps of the ENTER Model we assume that the goal of the diagnosis is to determine whether an individual is capable of attaining excellence in a talent

domain. In the first step *Explore*, an investigation is conducted primarily of the individual and his interactions with the surrounding environmental system. Among other things, we are interested here in general performance levels and behavior patterns in school, at home and within peer groups. Then in the second step, *Narrow*, is an attempt made to define a talent domain for the individual. This definition usually becomes more restricted with increasing age as well as with increasing ability levels. Following the identification of a promising talent domain, a specification analysis must be conducted in the third step, *Test*, of the actions which a person in the talent domain must be in the position to execute. The goal of this diagnostic step is to identify a learning path for the individual so that s/he will be able to execute the actions stipulated by the specification analysis. In summary, the concerns of the first three steps focus attention on

- Explore: the individual and his integration in the systems comprising his environment.
- Narrow: the identification of a suitable talent domain for the individual.
- Test: the identification of a learning path for the individual.

We would now like to illustrate the fundamental ideas behind the last two steps of ENTER, Evaluate and Review, with the help of an analogy. Let us assume that a businessman has established a messenger service in a large city. The goal is to deliver letters and small packages as quickly as possible. He believes that due to the high density of traffic in his city, that bicycles are the best means of transportation for his service. Therefore his „identification goal“ is to find persons who are particularly swift bicycle riders. If he later wants to evaluate whether the right persons were chosen for this job, it may very well be that he is satisfied with his choices. Analog to this example, a diagnostician could also be satisfied when the best applicants were identified on the basis of participation in a talent program.

If the businessman, however, expands the perspective of the evaluation, this high degree of satisfaction can well transform into discontent. Let us assume that with the benefit of hindsight, the owner of the delivery service comes to the conclusion that he should have rather chosen motor cycles as the means of transport instead of bicycles. A similar situation would occur if, directly after we determine that we did indeed select those applicants who would best profit from a talent program, we realize that an alternative promotional program would have been better for these persons.

ENTER makes allowances for the discrimination made in this analogy, in that on the one hand an inspection is made in Evaluate, of whether the *immediate goal* of the identification was reached. Then in Review this immediate goal is illuminated post hoc in the context of the entire process of the development of excellence. In the last step of ENTER, therefore, our own theoretical convictions as well as our practical experiences, on the basis of which we have specified a learning path to the identification goal, as well as the identification goals themselves are put to the test. Evaluate and Review serve as quality control points and above all assist in the further development of our identification methods, educational approaches and our theories on giftedness. In summary the last two steps of ENTER, Evaluate and Review are involved with the following tasks:

- Evaluate: The evaluation of whether the correct decision was made with respect to the goal of the identification.

- Review: A critical review of whether the goal of the identification was actually best suited for this person, to support the development of excellence.

2. The Actiotope Model of Giftedness

In the Actiotope Model of Giftedness (for details see Ziegler, 2004) the individual and his actions are at the center of the analyses. Giftedness here does not imply that an individual is in possession of specific personality characteristics such as a high level of intelligence or outstanding creativity. Rather, the Actiotope Model of Giftedness seeks to determine whether a person will one day be in the position to perform excellent *actions* in a talent domain, i.e. actions, which persons normally would not be in the position to perform even following intense occupation in the domain with the benefit of rigorous support. In order to answer this question, considerations must be made on three levels.

2.1 Components

In addition to the actions themselves four components of the actiotope are differentiated: The action repertoire and its determinants, the subjective action space, goals and the environment. These should not be considered to be isolated factors, but rather as parts of a complex interactive system. All four components feature a system nature and are themselves composed of subsystems (see Figure 2).

2.1.1 The action repertoire (and its determinants)

The action repertoire of an individual is defined as the universe of possible actions of a person, in other words all actions the individual would basically be capable of conducting when a) this potential action could be placed under consideration in the subjective action space (see 2.1.2), b) it pursues a suitable goal (see 2.1.3) and c) the state of the environment supports the execution of the action (see 2.1.4). These actions do not necessarily need to be demonstrated, for instance we do not have to perform all the possible multiplication exercises which we are basically in the position to calculate.

Of higher significance are traditionally the intrapersonal determinants of the action repertoire, which are, almost without exception, the main focus of most conceptions of giftedness. Some researchers presume that these are identical for all actions in all talent domains. For example, Renzulli (1976, 1977, 1984) assumes that above average intelligence, creativity and task commitment are the crucial factors of giftedness across all domains. In the Actiotope Model of Giftedness a not only more cautious, but also more differentiated and flexible position is taken here. A specification analysis of the actions a person should be capable of executing after excellence in a talent domain has been attained, provides the basis for the determination of the intrapersonal determinants of the action repertoire. It seems to be very improbable that these determinants would be identical in every phase of the development of excellence and for each and every talent domain.

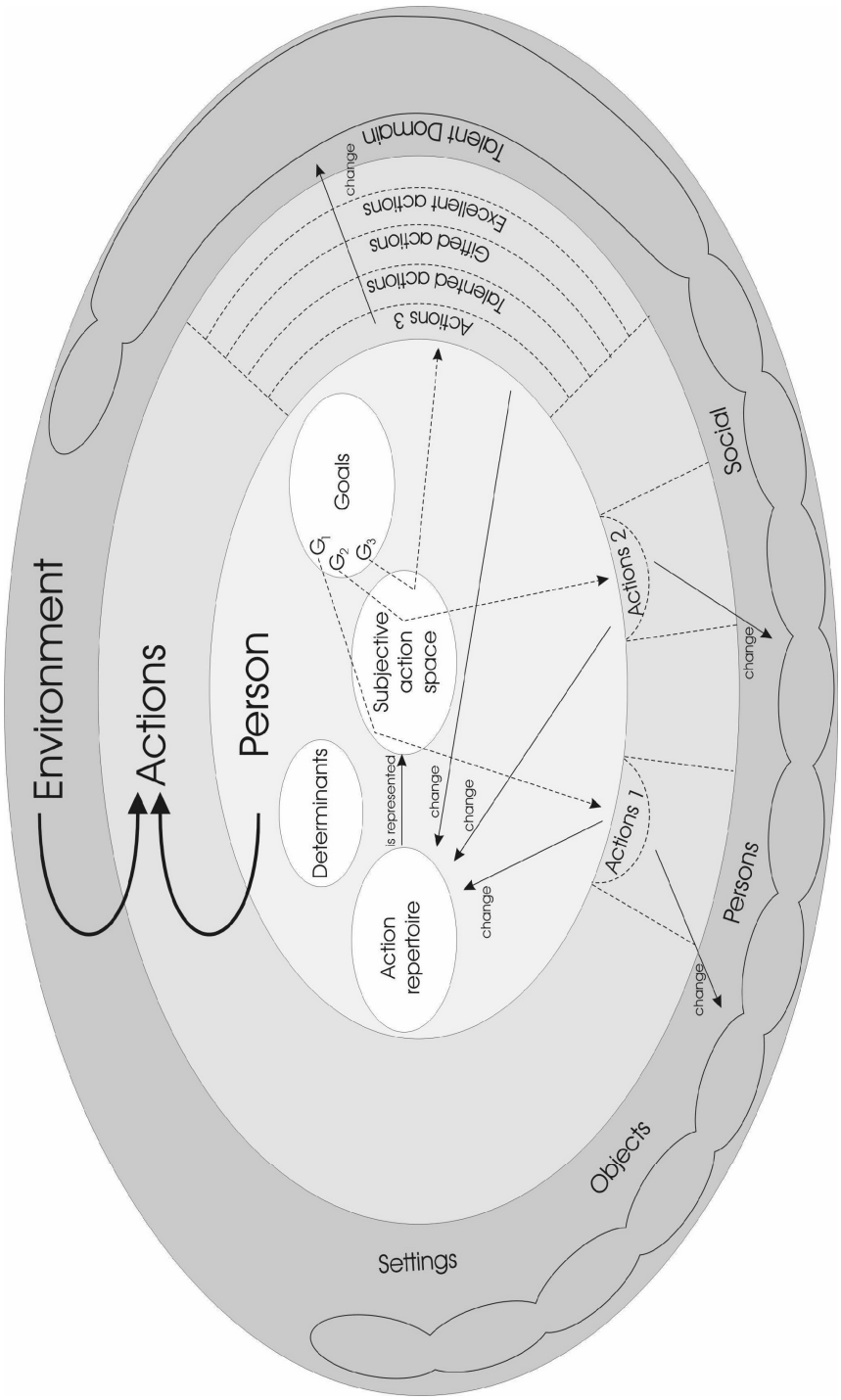

Figure 2:
The Actiotope Model of Giftedness (reproduced from Ziegler, 2004, Cambridge University Press)

2.1.2 Subjective Action Space

In each moment of his/her life a person is encountered by a tremendously large number of potential actions (Heckhausen, 1991). The construct of the subjective action space characterizes the capacity of the human psychic system to represent these actions (whereby the Actiotope Model of Giftedness does not specify how this actually takes place). Important here is, firstly, that effective actions are being represented in the subjective action space which permit the realization of individual goals. Second, these actions must be realistically evaluated, i.e. an individual must be able to assess whether this action leads to a desirable goal and whether he/she is capable of executing it. Third and finally, actions are coordinated and controlled in the subjective action space.

2.1.3 Goals

Goals fulfill four important functions. They help to determine the selection of an action alternative, they function as an energizer [catalyst] for actions, they provide the direction for the actions and finally they serve as an orientation for regulations during the execution of the action.

2.1.4 Environment

In the Actiotope Model of Giftedness two types of environments are particularly noteworthy. First the talent domain, or that sector of the environment in which a person may one day attain excellence. Second, those sectors of the environment which demonstrate a system character and in which the actions taken by persons are reasonably oriented on one another. This can, for example, be the family unit, but also settings such as an athletic training facility in which the goal of the action to improve athletic skills can well be served.

2.2 The actiotope as a system

The components of an actiotope interact in several various ways with one another. In fact, in the Actiotope Model of Giftedness the process of the development of excellence is not seen as the isolated development of one competence, but much more so as an adaptation of a complex system in which the action repertoire and its determinants, the subjective action space, goals and even the environment, all alter correspondingly. Here the actiotope must prove to have enough *flexibility* to change in the first place. For example, a chess player, who wants to attain excellence, must constantly expand his action repertoire. His learning goals must be constantly corrected so that they are always slightly higher than his current level of performance. The next learning actions which lead to this goal must be represented in his subjective action space. The environment must also be in a position to support this process. For instance, parents must take the time to bring their child to chess tournaments, a high quality chess club must be found in the area, computer programs and literature pertaining to the game of chess must be purchased regularly, etc. In order to insure the success of these

modifications and transformations of the actiotope, the actiotope must also maintain, secondly, an adequate level of *stability*. Parents who see themselves as being under too much stress to support their child in the development of his achievement, teachers whose self-esteem is threatened by gifted pupils or jealous peers are all examples of how the stability of an actiotope can be threatened, and how important co-evolutions of systems, with which the actiotope interacts, do not advance.

2.3 Progressive adaptation of the actiotope

The actiotope of an individual needs a long period of time in order to develop fully (Ericsson, Krampe, & Tesch-Römer, 1993), if indeed excellence is to be attained. A progressive adaptation necessitates the fulfillment of five points. In the first place, the individual must identify, whether an action was successful in expanding the actiotope. This is by no means a trivial task, as exemplified by the young violinist who could not discern whether he was playing cleanly or not. Second, situations in which the execution of this action can be successful must be subject to recognition. This directly addresses the problem of inert knowledge, i.e. a person must be in the position to synthesize not only declarative (knowledge of facts) and procedural knowledge (knowledge how to act) but also conditional knowledge (Mandl & Gerstenmaier, 2000). For example, one must not only know which learning strategies exist and how to apply them, but also in which situations a specific learning strategy would be particularly effective. Third, individuals need to be able to generate action variations in their subjective action space and to be able to selectively chose among them in their action repertoire. This ability is necessary for several reasons, for instance action variants compete with one another in an evolutionary process governed by the survival of the fittest action. Fourth, the actiotope must be, in order to remain adaptive, not only reactive, but also anticipative. If actions have been successful in previous environments, this is no guarantee that this will also be the case in future environments. Fifth individuals need effective feedback and feed-forward loops (in some cases even recursive) in their talent domain, in order to enable adaptations. An important role is played here by adequate feedback from competent persons (parents, teachers, trainer, etc.).

3. ENTER in the Framework of the Actiotope Model of Giftedness

Before we draw references between ENTER and the Actiotope Model of Giftedness a brief preliminary remark must be made. We have addressed three boundary conditions for ENTER, the theoretical model, resources and the goal of the identification. In the following passages the theory is stipulated as the Actiotope Model of Giftedness, with respect to resources we will, for the sake of simplicity, assume that they are sufficiently available. We would however like to leave the goal of the identification open. According to the ascertainment being developed, various contextual emphases will be assigned to the identification. For instance, if a comparison is being made of the results obtained from a specification analysis of excellent actions, very different results would be obtained for the domains of mathematics, sport or music. Since, however, this makes no fundamental difference in the procedure advo-

cated by ENTER, we will then disregard these aspects. In order to illustrate our explanations, we will occasionally refer to the diagnostic procedure adhered to in our counseling center.

3.1 Explore

The goal of Explore is to gather information on the individual and his interactions within and to the prevailing environmental systems. In the Actiotope Model of Giftedness we can substantiate this point in that we want to establish an overview in three areas:

- the components of the actiotope,
- the systemic properties of the actiotope, in particular its flexibility and stability,
- the previous development of the actiotope and its ability to achieve further adaptations.

In order to compile this wide variety of information, one must be able to draw on various sources. Here one should primarily be interested in sources which deliver, in the terminology used by Cattell (1973), L-data, in other words data which gives insight on actions and potential actions of an individual in real life situations. Since a comprehensive collection of all L-data is nothing more than a complete biography of an individual including his/her systemic interactions with the environment, one must be selective.

Of particular significance is the facilitation of a glimpse into the action repertoire of the subject. To this end we combine the following sources in the area of academics: The parents are requested to describe the typical weekly activities engaged in by the subject during the school year and during summer vacation in a weekly planner format. In addition, they are assigned a contact person in the area of academics (in most cases a classroom teacher) and are asked to fill out a questionnaire (developed by us) before the first meeting. On the basis of this information a diagnostic program is planned for implementation in our counseling center. Semi-structured interviews are conducted with the subjects and their parents for which special check-lists have been developed. These are used to assess the components of the actiotope, its systemic properties and its adaptivity. To this end a two step procedure is employed, whereby first general information for the actiotope will be amassed and then a diagnosis specifically tailored to the talent domain will be made in the Narrow step.

In addition to the L-data on the child, the so-called Q-data and T-data are also collected (Catell, 1973). Q-data are mainly based on questionnaires and refer largely to the goals, the subjective action space and the action repertoire of the child. Specifically we want to gather information on the goal components, aspiration level or the motivational orientation of the child (Ziegler & Stöger, in press a). Here the components of the subjective action space we are interested in, among others, are confidence in ones own abilities, helplessness or skills in the self-regulation of actions.

T-data are the results of standardized tests and primarily focus on the action repertoire and its determinants. In order to determine the current state of the action repertoire in the area of academics, one could utilize a nonverbal intelligence test and conduct a differential cognitive ability test. The latter also serves as an indicator of areas for which the Narrow step may need to be used for a more specific follow-up. For example, it could be combined with a special test on mathematical ability. Of further interest is information on, among other things,

learning strategies. Among the general determinants of the action repertoire, we are often interested in creativity (see Urban, in this volume).

If we compare these data with the general goals of the Explore step of ENTER, it becomes clear that the focus there placed on the ‚Individual and its systemic references' has been revised to the ‚actiotope and its systemic references'. The diagnosis on the basis of the actiotope model of giftedness is therefore more elaborate than usual and requires, according to our practical experiences, approximately four hours to complete. Time can be saved by collecting the Q-data and T-data in group testings.

3.2 Narrow

The transition to Narrow can only take place when enough general information has been collected to enable an assessment of an actiotope. Further diagnostic progress is determined by the specific aims of the diagnosis. The first alternative is that a concrete identification goal has been predetermined, for instance if a child is capable of participating in a talent program or if skipping a grade would be a suitable challenge for the child. The identification goal can, however, be rather unspecific and of a rather exploratory nature, such as the question of whether a child, who is demonstrating rapid learning progress at school or abounds in extraordinary achievements, is capable of attaining excellence in a specific area (or even in several) of excellence. The goal of Narrow then is to pointedly – either with respect to a specific goal of identification or the suspected talent domain – gather information in the three areas already described above, that is components of the actiotope, flexibility and stability of the actiotope and the progressive opportunities for adaptation in this talent domain.

The illustration of ENTER as a sequence of steps provides the identification process with a hierarchy, whereby an evolution takes place from a general consideration of the actiotope to a specific consideration. This does not, however, necessarily have to be the case. Particularly pragmatic reasons also speak for the possibility of a heterarchic proceeding, in other words the diagnostician has the flexibility, for example in an interview, to exclude or condense a topic when the opportunity presents itself. This may be occasionally necessary, particularly when a person can only be interviewed one time and no other chances are open to collect specific information. As in the Explore phase, L-, Q-, and T-data are collected (Cattell, 1973), however, the degree of specification which is to be applied is now defined with respect to the identification goal or the talent domain.

Unfortunately, for many talent domains no suitable measuring instruments have yet been developed, in particular no standardized tests. When such cases come up in our counseling center, we often rely on the judgment of an expert in the domain or an experienced trainer to assess learning potential in the performance area.

3.3 Test

The identification of talented individuals is, in practice, often reduced to the selection of the talented. The information collected in the Explore and Narrow phases were often considered to be adequate, since for a purely status-oriented diagnostic this information appears to be sufficient. Actually this conception of identification is based on a trait orientation, i.e. that

giftedness or talent are viewed as an attribute of a person, and one needs only to recognize this attribute in order to be able to correctly place this individual, for example in a talent program. This perspective is, however, irreconcilable with a dynamic point of view, such as that professed by the Actiotope Model of Giftedness.

Only after concluding Narrow, is it clear whether the goal of the identification (for example skipping a class) or excellence in a talent domain *can* be attained by the individual, not that it unconditionally *must* be attained. The *how* is still not yet fully clarified at this stage. To this end a learning path must be identified.

The first step in the Test phase is the fabrication of a specification analysis of the actions, the child should one day be in the position to execute. If the skipping of a grade is at the base of a question behind the identification, then we are here interested in the actions demanded by the class into which the child would be skipped, expressly the competent execution of specific mathematical operations.

In compiling descriptions of the envisioned actions, three properties of actions must be kept in mind. In the first place they have a *phase structure*, e.g. they are composed of a sequence of partial actions. The same action can be either widely or tightly described, similar to how an accordion can be either stretched out widely or squeezed tightly together (for more on the accordion effect among actions see Davidson, 1990). Here an example: One may well be content with the description „Must be capable of executing the mathematical operations described in curriculum for the 8th grade". A more intense decomposition of the phase structure in the specification analysis may prove to be necessary, such as „Must be capable of executing the algebraic and geometric operations described in curriculum for the 8th grade". This gains in significance when indicators are found in the Narrow step which point to weaknesses in the spatial skills which need to be well developed before taking up 8th grade Geometry.

Furthermore, one must also consider that actions are actually always executed in *parallel* – or are in other words *multiple actions*. A simple example here is the task of „solving an exercise in mathematics" which is often described as a single action. Actually, in solving such an exercise, several actions need to be conducted in parallel. So, a child which suffers from test anxiety could, directly in the midst of solving the problem, simultaneously be worrying about the negative consequences of failing to solve the problem, and parallel be searching for strategies of coping with this potential situation (Ziegler & Stöger, in press b). If the solution of the exercise requires that an answer be brought to paper, this could lead to a detrimental effect on performance due to a weakness in written skills (Savage, 2004) or motor skills (Sovik, 1993) . This leads to the third aspect of actions: They require *regulation on various levels*. Therefore, it should be determined which regulatory skills are needed and to what degree these should be expected from the child.

The answer to the question of whether a learning path can be developed requires an assessment of whether the actiotope is in the position to undergo a complex adaptation so that the actions isolated in the specification analysis can be executed. To this end, and against the background of the Actiotope Model of Giftedness, information from the following five areas must be collected, whereby one must always be aware of whether the functions named could possibly be fulfilled after appropriate interventive measures:

1. Does the child have access to a standard (or in some cases several standards) which can be used *to identify efficient and inefficient actions*? The example of a violinist

who needs to develop an ear for when he is not playing cleanly has already been brought up in this connection. If the child is not in possession of such means of measurement, it must be determined whether professional feedback can be made available. If the question at hand is whether a child should skip to a higher grade, one must for instance ascertain, that the child is capable of recognizing when isolated gaps in his/her knowledge have been closed or if more fundamental changes in learning need to be instituted.

2. Is the child capable of identifying *circumstances which would result in more efficient (learning) behaviors*? Should this not be the case, the opportunity to acquire conditional knowledge must be made available. Suggestions to this end can be developed within the framework of the cognitive apprenticeship approach (Gruber, in press).
3. Is the child capable of *generating action variants*? An assessment of the learning path stipulates that the child is able to apply his/her knowledge in the widest variety of diverse situations. Should this point be questionable then support may be offered, an example of such assistance can be found in work being developed by proponents of the cognitive flexibility approach (cf. Gruber, Law, Mandl, & Renkl, 1995).
4. An important question is associated with aspects of the *anticipative actiotope*, in other words whether the child is sufficiently prepared for possibly large scale adjustments to his actiotope. These can vary widely and can encompass, for example, the ability to integrate oneself into a new classroom environment after skipping a grade. Another example of a problem would be that after skipping a grade, the child must be able to think on another conceptual level, for instance in algebra calculations are no longer made with concrete figures as in arithmetic, but rather with unknown variables. The diagnostician must be able to identify the adjustments which will be encountered along the learning path, and must assess whether they can already be mastered or if additional support is going to be called for. In reference to the case involving integration into a new school classroom, this could encompass the mediation of social skills.
5. Finally, it is important to insure that effective *feedback* is made available over the whole course of the learning path and is therefore an important domain for the diagnosis. Feedback can incorporate various types of facets here. In addition to professional feedback, cyclical learning loops and support during the subsequent learning phases which a child may not yet have been exposed to, one can also offer motivational feedback when, for instance, a high level of motivation is necessitated in order to persevere the course of the learning path, and the diagnostician is not sure whether the child is capable of generating sufficient levels of motivation. Likewise motivational feedback loops are also necessary in order to avoid dysfunctional overmotivation, since this can present a severe threat to the stability of the actiotope. This deliberation is also relevant for another assessment, which is needed in Test, namely whether the actiotope is in possession of the stability required to endure these complex modifications.

Of particular importance in the drafting of a learning path is the aspect of the coevolution of the components of the actiotope. This is deliberated in several phases with the subjects and their parents. Our own approach is mainly based on principles of systemic coun-

seling (Barthelmess, 2001; Zander & Knorr, 2003). For instance, one needs to be sure that a developing and growing action repertoire can also be depicted in the subjective action space and that correspondingly challenging goals are being set. Furthermore one needs to secure in advance that the environment will also be offering increasingly stimulating learning opportunities. For each and every learning step which follows, one needs to insure that the actiotope is always in possession of an adequate level of stability; since every learning step signifies in principle a step away from equilibrium. Similarly, a collective effort is undertaken to ensure that the five adaptive functions can be fulfilled.

If one considers the first three diagnostic steps (Explore, Narrow and Test) concurrently, then the following specifications need to be accentuated in the adaptation of ENTER to the actiotope model of giftedness: For every step of ENTER a diagnosis must be performed for a specific problem area, for Explore this would be the general actiotope, Narrow is concerned with the actiotope in the talent domain resp. the established goal of the identification and Test is involved with the learning path. In addition, observation must be conducted on three levels, the components of the actiotope (actions, action repertoire, subjective action space, goals and environment), at the systems level (in particular flexibility and stability, which implies co-evolutions are possible) and the eventuality of an effective adaptation of the actiotope (identification of correct actions and situations, action variations, anticipative actiotope, feedback and feed-forward loops).

3.4 Evaluate and Review

In general practice the identification is usually considered finished after a person has been classified as gifted or talented, in seldom cases when a learning path has also been identified. Indications gathered with ENTER point out that, in certain respects, the diagnostic process itself is integrated into the identification. In addition to the reasons named above there are, from the perspective of the Actiotope Model of Giftedness, two further arguments as to why this expansion of the identification process makes so much sense.

In the process of identification, the diagnosticians become an active part of the actiotope of the person they are analyzing. For instance, if the diagnosis is a question of selection, which is often the case when a decision has to be made on acceptance to a specific promotional program, then they may well become relevant parts of several actiotopes. By merely supplying the applicants with the results of the identification one will most likely cause in a change in their actiotopes. By proposing a learning path, the diagnostician produces a massive influence on the development to excellence. In short: From the point in time when the diagnostician begins the identification process, he plays a role in the development of actiotopes, and for this reason cannot be removed from the overall picture.

Aside from the influence individuals have on their actiotope, there is another valid reason for incorporating Evaluate and Review into ENTER. The diagnostician is also part of a complex adaptive system, which has to develop within the framework of environmental changes and challenges. He also learns how to make better diagnoses, either as a result of observing the effects of prior diagnoses or as a result of reflections made on information supplied by colleagues or on the basis of new developments in the field of giftedness research. The criteria for the development of successful adaptive systems outlined above, can also be applied to the diagnostician himself. Evaluate offers him feedback on whether the learning path he

chose to engage was successful or not, Review offers him feedback on whether his methodology and theoretical models are correct. This information helps him to be able to develop his actiotope in direction of diagnostic excellence.

The function of the Evaluate step is to determine how well a subject realizes the aims and goals of the identification. In order to ascertain this, suitable success criteria must be clearly outlined. The pallet of possible criteria is very broad and includes, among others, scholastic grades, academic titles, honors, extraordinary achievements such as publications or works of art. The focus is not only on the attainment of intermediate goals (for example whether the grades the child receives in class in which it is placed on the basis of this recommendation meet expectations/do not meet expectations) or of excellence, but rather if co-evolution of the actiotope took place in accordance with the systemic approach.

If the evaluation step of the ENTER Model is only seldom taken into consideration in practice (see Holling & Kanning 1999), then in general the review step is accorded even less importance. This is primarily due to the high degree of investigative effort involved which is, however, not always included among the resources at hand. In the Review step, the purpose of the investigation and the model of giftedness on which the identification is based are put to the test.

One example of the necessity of reviewing the model of giftedness is offered by the famous study conducted by Terman (1925). This study was based on a very simple model of giftedness: Giftedness was equated to a high level of intelligence. Terman expected that high intelligence would precipitate achievement eminence. Curiously, he refused to admit two persons into his sample who later went on to win Nobel prizes, because they did not reach the level of intelligence he laid forth. Obviously, Terman based his study on an insufficient model of high ability.

Regarding the examination of the purpose of the identification, the review step demands a methodological comparison among the test persons who attained the goal of the identification and those who could not attain this goal. When, for example, it can be ascertained that no single participant in a certain talent program has attained excellence, then this places the value of this talent program in question. Finally, in the review step, the attainment of expertise determines the success of the purpose of the identification and the usefulness of the model of giftedness upon which the identification is based.

In light of the fact that the Actiotope Model of Giftedness has only recently been made public (Ziegler, 2004), only isolated experiences with the Evaluate step have been published, however this is not yet available for the Review step, specific claims here would be premature at this time.

4. Discussion and future outlook

The preceding theoretical deliberations were conducted under the assumption of unlimited investigative resources, which is a reference to the most desirable of conditions. In practice however, resources are always subject to limitations. Since ENTER is, with respect to the Actiotope Model of Giftedness, extremely data intensive, the question of the practicality of this approach must be addressed.

In the first place, one must point out that limited resources, from an ethical perspective, can *never* serve as a justification for making decisions on insufficient information (Alisch,

1995). An identification, which is being made with a specific purpose in mind, is often associated with extensive biographic cross references, for instance when a change of schools is suggested. The diagnostician therefore has the responsibility of exclusively performing identifications which respect standards of measurement and can plausibly legitimatize the subsequent pedagogic decisions. Critical inventories, however, make evident that this is often not the case. For example, for approximately 50 % of the identifications for talent programs analyzed by Ziegler & Raul (2000), only IQ and achievements were considered. In other words: The economic restrictions on an identification can never serve as a justification to take short cuts, so long as the information eventually gathered does not meet the requirements needed to attain the goal of identification.

In the Actiotope Model of Giftedness, excellence is considered to be a result of the adaptation of a highly complex system. However, complex adaptive systems are "adaptive nonlinear networks" (Holland, 1995), in that several systems interact with one another and produce sudden, emergent changes in the actiotope. Psychological measuring instruments are usually conceptualized with the intention of describing causal linear processes. They inevitably come against their limits when systemic processes are the focal point. For example, the performance levels of gifted girls in the area of natural science cannot be predicted adequately by their IQ levels, since these girls tend to pursue on the average less challenging learning goals and the surrounding environment does not really accord them a particular aptitude for the natural sciences. A large handicap for identification on the basis of the Actiotope Model of Giftedness is, therefore, the present deficiency in measuring instruments, which have been tested in practice and one would deem suitable for a system-oriented application.

In addition, conceptions of giftedness almost exclusively concentrate on general aspects of the acquisition of excellence as a central theme. For the question of whether excellence can be attained in a specific domain, theories which focus attention on the acquisition of excellence *within* these domains are of prime importance. Such conceptions should consider, for instance, that the motor function of the fingers is dissimilarly important for the acquisition of excellence for a violinist in comparison to the acquisition of excellence for a basketball player. The identification must also be accordingly adapted. However, identifications are usually conducted without consideration of a specific domain (Ziegler & Heller, 2000). Although general guidelines for identification and rough standard procedures for Explore can be specified, this is not possible for Narrow and Test. Here the diagnostician must draw on the individual domain-specific theories of development of excellence and tailor the identification accordingly.

A further explanation as to why no standard procedure for identification can exist, can be found in the individuality of the subjects' actiotopes. For example, each individual is embedded in a different system which itself can exercise a great deal of influence. Above all, when a learning path is to be identified, then the result will be uniquely tailored to the subject in question. Biographies of persons who have attained excellence in a specific domain emphatically attest to this (Feldman, 1992; Gardner, 1997). The resulting necessity of an idiosyncratic identification requires a similarly intense degree of diagnostic specifications.

In return for this extensive effort one is potentially in the position to obtain a large return in the form of diagnostic precision. If one considers the fact that, in the first place, research is still very far away from the capacity to predict excellence with the help of linear causal models (Gruber & Ziegler, 1996, Howe, Davidson, & Sloboda, 1998; Simonton, 2000; Trost,

2000) and this is inadequate for individual diagnoses, and in the second place, that far reaching decisions are to be made on the basis of identifications, which represent massive encroachments in the lives of persons, then in our opinion, elevated levels of diagnostic expenditure are warranted.

Admittedly at the present time, no systematic evaluations of identifications conducted on the basis of ENTER with the Actiotope Model of Giftedness have yet been submitted. This approach has only been subject to practical application for about one year, whereby new measuring instruments needed to be developed due to the pure novelty of the procedure. A positive aspect here can certainly be found in the certainty that further progress will occur and more measuring instruments will be developed which will enable a systematic examination of the model and its systemic approach. If one would like to express a comprehensive assessment of the approach in the terminology of the ENTER Model, then the experiences accumulated so far would suffice for an execution of the Evaluation step, which explains why a Review of its empirical efficiency is not yet possible. Nevertheless, it appears promising to us to further pursue the path we have embraced.

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