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What does dynamic testing entail?

Does this type of testing represent a supplement or an alternative to the traditional use of tests in educational and psychological assessment and counselling? Possible implications for practice.

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INTRODUCTION

The Norwegian Education Act section 5-6 states that 'the educational-psychological service shall ensure that expert assessments are prepared where this is required by the Act.' This expertise work, which demands a considerable use of time for assessments, seems to have only increased in volume from year to year. The assessment is meant to show whether referred pupils are in need of special education and what treatment programmes should be offered. This entails assessment and counselling concerning the scale of such programmes, but also assessment of what content and methodical approaches should be used in this type of special education.

The use of standardised**,** prescribed testing of cognitive functions has traditionally been at the centre of this assessment.

Is it then a fact that these traditional, and often standardised, prescribed tests and testing methods in a suitable way contribute to giving valid answers to the questions at the centre of this important assessment work? Or are there other ways of using tests, or other testing procedures based on other *assumptions* and with other *goals* in mind that can supplement or represent an alternative to traditional tests and the use of testing within educational and psychological assessment?

This article aims to explore these questions, and will finish with a comment on possible implications for practice.

A CRITIQUE OF TRADITIONAL TESTING PROCEDURES

The discontent with traditional testing and assessment methods (i.e. standardised psychometric testing[1]) has become more widespread over the last decades. Bransford et al. (1987) have given three arguments as to why one should abandon *traditional assessment methods* (especially with regards to for instance the standard use of intelligence- or cognitive tests) and move towards what can be described as *dynamic testing procedures.* Furthermore, they claim that the discontent, especially with standardised intelligence tests, is often based on one or more of the following three basic arguments:

a) Traditional assessments deal only with the products of learning, disregarding learning processes.

b) Traditional assessment do not address the responsiveness to instruction.

c) Traditional assessment do not provide prescriptive information regarding potentially effective intervention techniques. (p. 482)

Thus, researchers concerned with dynamic testing procedures are often questioning the usefulness of using products in the form of cognitive performance (e.g. test scores and solutions to problems) as the basis for classifying and predicting learning ability, cf. item a above. Since the important aspects of cognitive functioning has to do with how children acquire, store and utilize information or knowledge, it is argued that the best way to assess cognitive abilities contains a direct assessment of the thought processes behind the cognitive products.

As for item b above, many advocates of dynamic testing are questioning whether considering *previous* learning is the best way to predict *future* learning, which is the premise

[1] Psychometrics: a psychological science of measurement; the use of statistic methods to investigate psychological case circumstances.

of traditional testing. Here, the argument against traditional testing is that this implicitly assumes that the children being tested have had equal opportunities for previous learning.

In reality, there will have been great and fundamental differences in previous learning possibilities (with regards to what is being measured) between e.g. minority children and children with physical and/or mental disabilities on the one hand, and children with so called normal development and without special educational needs on the other. Because learning conditions will most likely lead to children being on different levels in their learning, it can be argued that it is important to find out how a child learns in a positive learning environment, before one can have any hope of making more precise claims as to the individual child's learning possibilities or learning potential.

As for item c above, many claim that the results of traditional testing methods cannot be 'translated' into precise and effective teaching programmes. It is argued that suggestions in reports from traditional or static testing methods often represent general measures based on broad generalisations or measures of a general character meant to 'match' the general level of ability that the pupil seemingly has (Arter & Jenkins 1979, referred to in Lidz 1987).

What many critics want out of educational and psychological testing, are suggestions to specific and individual measures based directly on the learning difficulties of each individual child.

VARYING TERMINOLOGY

In the last two decades several books have been published that represent a challenge to the more traditional and static way of conducting assessment. Even though the titles of the books reflect a difference in terminology, they are alike in that they represent a new and more or less common testing approach compared to the traditional one.

The first book that should be mentioned, is Feuerstein's classic *Dynamic assessment of retarded performers* (1979), the second and third are Carol Lidz' *Dynamic Assessment. An Interactive Approach to Evaluating Learning Potential* (1987) and *Practitioners guide to dynamic assessment* (1991). The fourth book is Haywood & Tzuriel's book *Interactive Assessment* (1992). The fifth book is *Learning Potential Assessment* (Hamers et al. 1993). It should also be mentioned that Ashman and Conway (1997, p. 103) use the term *interactive testing* throughout, while at the same time pointing out that this is sometimes referred to as *dynamic testing* or *testing of learning potential*.

In the many articles written on the subject, one also finds a varied use of terms, though the authors usually point out more or less synonymous terms to clarify their position in relation to the varied use of terminology one finds in this area. In this connection, *learning test* (Guthke and Stein 1996) should be added as an alternative term. *Process assessment*, a term used by e.g. Meyers (1987), is yet another alternative in addition to the more common ways of naming this new way of relating to testing.

Carl Haywood (1992) states that there is no general agreement on the terminology in this field. He suggests *interactive assessment* as a general term. His argument for this is that the more familiar term *dynamic assessment* is associated too much with a specific method, namely that of Feuerstein.

Despite Haywood's argument, I choose to use *dynamic testing*[2] as a general term. In addition, I will occasionally also use the terminology specifically used for the different approaches within dynamic testing while discussing these.

DEFINITIONS AND CHARACTERISTICS

Several people have offered their own definitions and characteristics of dynamic testing on slightly different levels of accuracy.

According to Haywood (1997) *dynamic testing* (my terminology) is used to denote a great variety of approaches within psychological and psychoeducational testing that all promote a more active relationship between the test leader and the subject than what one finds within traditional prescribed and standardised testing.

Another way of shortly characterising the approach, is found in Jitendra and Kameenui (1993, p. 8): who express that "The salient feature that seems to characterise all dynamic assessment approaches is the use of 'guided learning' to determine a learner's potential for change".

On a more general level, Ashman and Conway (1997) argue that dynamic testing is related to the need to make testing more interactive. Furthermore, they claim that this is derived from the belief that it is important to estimate the potential of the individual and to discover the conditions under which a person is able to learn in the most efficient way possible. The testing procedure is furthermore denoted as an active procedure where both the examiner and the learner get involved in a dialogue that aims to explore to what degree the achievements of the individual can be modified through this interaction.

In Lidz' more elaborate definition, dynamic testing is referred to as

> ...an approach that follows a test-intervene-retest format, and that focuses on learner modifiability and on producing suggestions for interventions that appear successful in facilitating improved learner performance. Dynamic assessment also provides information regarding functional and dysfunctional metacognitive processes, as well as regarding intensity of intervention involved in producing change
>
> (1991, p. 6)

According to Lidz (1995), it is also typical for dynamic testing as a procedure to start where more traditional testing procedures end, because the focus is especially directed at the means required to help the person in question to reach the next, or a new, functional level. Traditional testing procedure is here understood as the equivalent to pre-testing in *a pre-testing – teaching/intervention – post-testing-scheme*, in light of which possible effects of the intermediate phase might be seen.

There is no unique standard material that constitutes the foundation of dynamic testing. Dynamic testing is rather a model or a procedure that is interpreted in many ways, has different degrees of standardisation, and that is used in very different fields.

To sum up, one might say that as opposed to more traditional testing, which mainly registers the products of *previous* learning, dynamic testing also aims towards studying the potentials for *future* learning (with possible subsequent counselling) through involving the test

[2] Assessment and testing are not considered to be synonymous phenomena, though their use often overlaps. Assessment often entails evaluation beyond testing that can also include observations, interviews and various evaluations, etc. The literature I refer to in this article refers mainly – despite its different use of terminology – to the content in the interaction between a test leader and a test subject. My choice of *testing* instead of *assessment* is based on this, though the goals behind and the form of interaction within the different approaches to a great extent vary.

subject in situations where he/she has to communicate, and in education/learning situations that might be more or less standardised and that form a supplement to – or in some cases an alternative to – the product of traditional testing.

In the following, I will discuss three different dynamic testing procedures in order to provide an expanded understanding of what dynamic testing entails. First, however, I will comment on the roots of these testing procedures.

THEORETICAL ROOTS AND FURTHER DISCUSSION

A general way of thinking that seem in many ways to be an equivalent to dynamic testing is really not a new thing[3], and seems to have been a part of teaching and learning situations for a long time. Effective teaching always involves some form of pre-evaluation before the teaching is conducted, followed by a re-evaluation to be able to evaluate the learning process and the results of learning.

According to Lidz (1997.1), the works of Vygotsky (1978) and Feuerstein et al. (1979; 1980) have had the greatest theoretical impact on dynamic testing.

Carlson (1994) also names Vygotsky as the most influential theoretical contributor to the development of dynamic testing. Furthermore, Carlson claims that even though several of the approaches within dynamic testing are not explicitly built on Vygotsky's theoretical work, they are nevertheless in accordance with central ideas in his thinking.

Grigorenko and Sternberg (1998) also consider Vygotsky to have introduced dynamic testing as a concept within modern psychology especially early, although they do point out that it is debatable who should be credited for the more modern understanding of dynamic testing.

Vygotsky's definition of the zone[4] of proximal development as an important component in the assessment of potential, in addition to the actual development level, has been the most central term in his contribution to dynamic testing. The zone of proximal development is explained by Vygotsky as

> the distance between the actual developmental level as determined by independent problem solving, and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers.
>
> (1978, p. 86)

While the *actual development level* represents the individual's *independent* level of problem solving or accomplishment, *the zone of proximal development* represents what the individual might accomplish with the support from or in collaboration with a more skilled partner, as for instance a parent, a teacher, a friend, or a sibling. It has, then, to do with the 'proximal' level of potential development, or what is within reach with the required aid. 'Proximal' is in quotation marks here to indicate that what constitutes the zone of proximal development is continuously moved to a higher level, depending on what the actual development level is from time to time.

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[3] For further discussion of dynamic testing and its history, see the following sources: Lidz 1987, Haywood & Tzuriel 1992, Ashman & Conway 1997, Grigorenko & Sternberg 1998.

[4] The idea of the 'zone of proximal development' (ZPD) has led to the development of several related terms and educational programmes throughout the world. For example, 'scaffolding' is a metaphorical image which stands for much of the same as 'the zone of proximal development'. Furthermore, 'the construction zone' (Newman et al.1989, discussed in Grigorenka & Sternberg 1998) serves to be mentioned as a somewhat expanded educational definition of ZPD.

Vygotsky's message, in relation to what we today consider to be the idea behind dynamic testing, might be summed up through the following quotation:

> What children can do with the assistance of others might be in some sense even more indicative of their mental development than what they do can do alone.
> (1978, p. 85)

Another of Vygotsky's formulations paints a good picture of the interactive context which the zone of proximal development must be understood in light of, while at the same time expressing the view that what is possible within the zone of proximal development today, will be able to represent an actual and independent development level tomorrow:

> ..what a child can do with assistance today she will be able to do by herself tomorrow.
> (1978, p. 87)

A supplementary way of characterizing the zone of proximal development is given by Leontev:

> To discover not how the child came to be what it is, but how it can become what it not yet is.
> (Quoted in Grigorenko and Sternberg 1998, p. 78)

In other words, the zone of proximal development reflects development in itself, because it focuses on what one *might become or develop into*, and *not* what one already *is or has developed.*

As previously mentioned, Lidz (1995) has claimed that dynamic testing starts where traditional psychometric testing ends. Instead of finishing the procedure based on findings defining an upper limit on the basis of administrative rules, a 'dynamic tester' sees the upper limit as something that in itself should be made the object of exploration.

While normed, standardised cognitive tests, knowledge- and achievement tests give information concerning the individual's functional level without aid (the actual development level), dynamic testing aims to 'map' the zone of proximal development and the potential for development through registering the individual's functioning in more closely defined interaction with others.

Information regarding functioning on the actual development level, as well as within the zone of proximal development, will be necessary to obtain the best possible understanding of the individual's current basis and learning potential (Vygotsky 1978).

Feuerstein's theoretical and empirical contribution to dynamic testing, which according to Lidz (1997) has had significant influence on the development of parts of this testing tradition, will be further discussed later in this article.

Hamers and Resing (1993) also point out two other roots, namely the development of cognitive psychology and the research on learning ability, as additional bases for the development of dynamic[5] testing as a tradition – these roots will not, however, be further described here.

[5] Described as 'learning potential assessment' in their terminology.

SOME SAMPLE APPROACHES WITHIN DYNAMIC TESTING

Many models for dynamic testing are described in literature, and different researchers sum up and emphasise different methods.[6] Nevertheless, there are three methods or approaches that seem to have had special impact on this field, namely:

1) Budoff's Learning Potential Assessment
2) Feuerstein's Learning Potential Assessment Device (LPAD)
3) Campione and Brown's Guided Learning and Transfer Model

These three are representatives of relatively early, but still useful methodologies within dynamic testing. Gradually, there seems to have been a development within the dynamic tradition from tests directed at revealing 'intelligence' and 'the general learning potential', towards more specific testing of qualifications and towards subject specific tests. This entails tests that are also concerned with learning potential and with finding positive conditions for the teaching/learning of reading/writing/mathematics etc.

The methodological approach of Budoff (and associates)

The work of Budoff (and associates) in Cambridge, Massachusetts was especially prevalent from the mid-1960s to the end of the 1970s.

According to Hamers and Resing (1993), one of Budoff and associates' earlier works draws on Vygotsky's idea of the zone of proximal development, as this is interpreted by Luria (1961) [7] with the aim of establishing procedures to re-diagnose children who had obtained low IQ scores through traditional testing.

Through their research, Budoff (1987a) and associates developed testing procedures that could serve as an alternative to traditional IQ testing. The goal was to obtain the best possible assessment of children's learning potential as a basis for making a recommendation concerning their need for special education and their placement within the school system.

Budoff argued that the result of a training oriented approach that uses a testing – training – (re) testing[8] procedure would be better suited for uncovering children's real cognitive possibilities than testing that solely aims towards ascertaining children's functional level through a traditional testing procedure.

Through this three-leafed approach, Budoff believed that greater justice and equal treatment could be obtained within testing when it came to children from linguistic minorities or cultural minorities and children from lower socio-economic groups. He especially focused on children who through previous ordinary testing had obtained low scores corresponding to the level of mental retardation, or what we today call mental disability, as well as on children who, based on their background, were considered to be potential underachievers.

Through his work, Budoff developed 4 different instruments for assessing the learning potential of children/pupils in different age groups. The tasks correspond to what is likely to be found within common non-verbal intelligence tests. One adaptation of Raven's Matrices[9] should be mentioned here – Budoff himself sometimes calls this 'the Raven Learning

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[6] In Lidz (1997) and Grigorenko and Sternberg (1998) one finds interesting classifications of dynamic approaches and surveys of the use of dynamic testing procedures for different purposes.

[7] Luria. A. R. (1961). 'An objective approach to the study of the abnormal child'. 'American Journal of Orthopsychiatry', 32, 1-14.

[8] Budoff (1987b) has also used other testing paradigms to uncover learning potential than the testing –training – testing paradigm. This is especially the case in his work with persons with moderate or serious mental disabilities (p. 193). Furthermore, he points out that the testing – training – testing model is only one of many possible training or practise based testing procedures.

[9] A 'non-verbal' intelligence test, originally developed to measure 'general' intelligence, or 'Spearman's g factor' (Anastasia and Urbina 1997).

Potential Test' (this is aimed at children aged 12 and younger, but it can also be used on youth up until the age of 15).

Despite the use of a testing – training – testing procedure, Budoff's approach has a psychometric and experimental character. The psychometric character relates to the fact that Budoff has tried to develop relatively standardised approaches and norms that can be assessed against scores on a Binet or on a Wechsler[10] scale. The experimental character is to be found in his approach in general, as well as in his willingness to vary the general training procedures depending on the functional level of the test persons, so as to be able to uncover their learning potential as best as possible.

When it comes to e.g. Raven's Matrices, Budoff (1987b) uses standard administration of the test with the testing *before* and *after* the training period (i.e. pre-testing and post-testing) in order to establish measurements that might serve as a basis for assessing the effect of the intermediary training. The possible improvement that is registered then forms the basis for the assessment of the test person's learning potential or learning ability.

Which form of Raven's test to use (there are three variants), is decided by the test person's age and linguistic background. The training is performed with patterns of a similar character that do not correspond with the Raven drawings. First, the test persons are often asked to draw patterns with their solutions, thereby gaining experience when it comes to finding the solutions on the basis of the specific pattern characteristic or the specific attribute that must be taken into consideration. Subsequently, they move over to the mental solutions to corresponding tasks, and learn to verbalise how they reach the solution before the post-testing takes place.

The test leader's task is to lead/control the test person's attention by for instance explaining which pattern attributes to focus on while working to find the solution, and by leading the test person from the concrete motorial solution attempts towards abstract solutions based on understanding. The training can be standardised, though it might not be possible to follow the procedure to the letter. It is recommended to split the training, which may take one hour total, into shifts of two half-hours over two days – if possible.

Budoff did not build his test methodology on an underlying, coherent theory structure concerning children and youth's learning and development and how this might be promoted and optimised. The central premise of Budoff's approach is rather an understanding of intelligence that emphasises its trainability, and the ability children have to profit on their learning experiences. In his research, Budoff found that test persons who have obtained the same scores might benefit differently from the training phase in his dynamic testing procedures (cf. Vygotsky's thoughts on the zone of proximal development). While some score considerably higher, others will score more moderately, and there will also be those who will hardly exceed their achievement level from the preliminary testing.

Budoff (1987a) and his colleagues have conducted many studies to validate the results of their approach. The results here may indicate that weakly functioning pupils with high learning potential (as this appears by comparing pre and post-test results after the training sequence) will benefit from getting special education while being integrated into an ordinary class, whereas pupils with low learning potential may benefit more from being taught in a smaller group. The level of transferability is debatable, as this is research conducted 20 years ago in the U.S.

It should also be mentioned that Budoff, based on follow-up research, believed that the prognosis of becoming economically and socially independent as an adult was better for weak pupils with high learning potential, than for similar pupils with less learning potential.

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[10] Two very well-known intelligence tests/scales. One version within Wechsler's scales is WISC-R, which I will refer to further down.

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An obvious limitation to Budoff's approach is that it used content (e.g. Raven's Test) that has little connection to the subjects the pupils face in school. Even though uncovering high learning potential in presumed weak pupils will be a positive discovery that may predict greater possibilities in the future, this will most likely have only limited transferability when it comes to planning adapted teaching. This is a concern that Budoff himself has been aware of. As for the need to attach a testing procedure to the development of suggestions for educational programmes, he says the following:

> What has not been readily available is a methodology by which to translate the results of Budoff's training-based procedures into prescriptive treatment programmes for individual clients. In formulating an assessment strategy, the client's strengths and weaknesses should be ascertained in the initial testing contacts or from the referral…. Appropriate training and post-test(s) to test hypotheses would be designed/selected. Subsequent contacts would be used to test and generate hypotheses, and, finally, formulate a treatment plan…. Carefully designed tests with appropriate training would allow the identification of the areas of functioning likely to benefit and the teaching strategies appropriate to the particular person.
>
> (1987a, p. 78)

This way of connecting testing and the development of educational programmes is similar to the perspective promoted by Feuerstein (1979 and 1981), which will be discussed next. Birkemo (1996) deems Budoff's form of dynamic approach with a psychometric quality to be relatively simple, so that it should be suitable for use within practical diagnostic work. If norms for learning potential within different age groups could be developed here as well, he claims that one would have a tool that could function as a supplement to the traditional testing methods used within educational and psychological assessment.

While this branch within dynamic testing seems promising as far as it has been developed, there seems to have been conducted little research on and development of this methodology after the late 1970s (Ashman and Conway, 1997). An interesting and comprehensive survey of this research is, however, presented by Budoff himself (1987a, 1987b).

<u>The approach of Feuerstein and associates</u>

The second approach within dynamic testing that I will discuss is developed by Reuven Feuerstein and his colleagues (1979, 1981, 1987, 1988). Feuerstein was one of the researchers who, after Israel was declared an independent state, worked with mapping the mental capacity of often unschooled Israeli immigrants, aiming to get them integrated as best as possible into Israeli society. This work, and Piaget and Andre Rey's theories of cognitive development, among other things, convinced him that bad achievements were often caused by cultural[11] and social deprivation. Among other things, these experiences were important when he and his colleagues developed their instrument for dynamic assessment of learning potential (the Learning Potential Assessment Device), abbreviated as the LPAD model.

Feuerstein's LPAD model is based on his theory of cognitive development and modifiability which among other things entails two central terms, namely *Structural Cognitive Modifiability* and *Mediated Learning Experiences*.

[11] In this connection, Feuerstein makes a significant distinction between cultural deprivation and cultural difference.

In connection with the theory of Structural Cognitive Modifiability, Feuerstein defines intelligence as the individual's propensity[12] to adapt to new situations through modifications of the individual's cognitive system. The theory postulates that people's cognitive, emotional and behavioural functions can change structurally. In other words: the individual is regarded as an open system where the level of functioning depends on the unique experiences the individual makes in his/her development.

In this connection, Feuerstein makes a distinction between two main types of learning. The first type involves a development or change (modification) in the individual as a result of *direct sensory experiences* without any form of intervention or influence from another person. The other way is referred to as *mediated learning* above, and is described by Feuerstein as

> … the interactional processes between the developing human organism and an experienced, intentioned adult who, by interposing himself between the child and external sources of stimulation, "mediates" the world to the child by framing, selecting, focusing, and feeding back environmental experiences in such a way to produce in him appropriate learning sets and habits.
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> (1979, p. 71).

Feuerstein also states that the mediating agent will usually be one of the parents, a brother or a sister, or another care person.

Feuerstein's description of mediated learning as a phenomenon constitutes a theoretical framework that points out an alternative way of understanding the reasons for retarded cognitive functioning. In this connection, he makes a distinction between what he calls '*distal'* and '*proximal*' *aetiology*. The distal (or distant) aetiology includes phenomena that we usually presume are the causes of retarded cognitive performance/achievement – i.e. hereditary/genetic factors, organic factors, reduced environmental stimulation, socio-economic status, emotional problems in children and parents, cultural differences etc.

Feuerstein argues that these factors are not necessarily direct causes of retarded performance. Instead of 'triggering' the retarded performance, they rather elicit the proximal (or close) aetiology – the lack of mediated learning. The lack of mediated learning can thus be seen as the direct cause of the cognitive deficiency that can be registered, regardless of distal aetiology. The performance/achievement of individuals who have not received sufficient mediated learning is often characterised by a failure in the cognitive functions that are presumed to be the conditions for operational, internalised representational thinking. Such a deficiency will in itself cause the child to not be able to become optimally modified by direct influence of stimuli.

Feuerstein's central premise is therefore that if the child is sufficiently imparted with mediated learning, which in turn may overcome or contribute to an evasion of the factors that are presumed to prevent mediation (cf. the distal aetiological factors), then the foundation for a normal cognitive development is laid.

The LPAD model is designed for use on older children (from age 9 to 18) and adults. It consists of up to 11 (sub) tests, included administration of a variant of Raven's Matrices. When a test leader uses LPAD he/she will be able to lean on a survey of possible deficient (weakened, failed or insufficiently developed) cognitive functions[13] that are considered to be potential reasons for the test taker's possible difficulties with solving problems and acquiring learning in connection with the test. In addition, the test leader leans on what is denoted as the

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[12] Defined as potential in the form of an inherent qualification, power, energy, later on named as propensity (Feuerstein, lecture, Bordeaux 1998).

[13] 'Deficient cognitive functions'. This list describes an input level, an elaboration level and an output level, each level with its own set of defined deficient functions.

cognitive map, which consists of 7 items that help the test leader analyse the tasks in LPAD. These 7 items can lead the test leader in his/her efforts to understand and analyse why the test taker may fall short when it comes to problem solving.

The ultimate goal of using LPAD is that the results will contribute to the development of an intervention programme for the test taker.

LPAD is administered individually (though there has also been developed a group version).

The process in LPAD is characterised by a division into three phases, namely *testing – mediate – testing*. During this process, there is more focus on the process itself than on the product.

Through the pre-testing phase one aims to establish a baseline for how the test person functions within certain cognitive areas, thereby determining the individual's need for modification in these areas.

In phase two, the test person is taught according to certain principles of mediation.[14] The focus here is on the attempted remediation of presumed deficient cognitive functions. The mediation of strategies and principles for problem solving in different cognitive task areas is also important, and the test person is helped to use these on increasingly more difficult tasks.

Finally, the re-testing phase tests to what extent the mediation process has resulted in an approved performance of new and more complex tasks concerning problem solving.

In this way, through the use of LPAD as an instrument, one tries to determine to what degree a person's learning ability is modifiable. Feuerstein claims that this says a lot more about a person's future possibilities for learning and functioning than the common static measurements for IQ and mental age that are likely to appear when using a traditional testing procedure. In most traditional tests, the focus is on the product of a cognitive process.

The administration of LPAD is far more open than Budoff's procedure, so a standardisation of the work method is not an issue. Nevertheless, there are of course specific guide lines that the test leader follows when interacting with the test person. According to Lidz (1991), Feuerstein's approach is different from e.g. Budoff's in that while Budoff underlines the importance of 'revealing' or discovering the individual's existing learning ability, Feuerstein aims towards *changing* the child's learning ability and cognitive functioning and towards determining what an intervention programme should consist of.

Thus, LPAD aims more towards changing existing deficient cognitive structures in a child than towards finding the child's zone of proximal development, cf. Vygotsky.

According to Ashman and Conway (1997), Feuerstein's LPAD is the most frequently used instrument within dynamic assessment thus far. At the same time, they point out that LPAD is a very time-consuming instrument to understand, learn, and not least to use. LPAD has been used on quite a lot of different and special groups in many places in the world. Different scientists have different evaluations of how effective LPAD is. Feuerstein and associates represent a mainly positive critique, while e.g. Frisby and Braden (1992) are very critical of LPAD's value as a method.

Nevertheless, one of the strengths of Feuerstein's dynamic approach is that it is founded on a theory of cognitive development and modifiability. Another plus is that it is possible to conclude what teaching measures to offer the test person based on the discoveries that are made. For this purpose, Feuerstein has developed a teaching material called 'the Instrumental Enrichment Programme'. Considerable critique, here represented by Lidz (1991), has been directed towards this intervention programme because the value of transferring this to educational practice in schools seems unclear. Lidz also stresses that there

[14] The following 6 principles characterise a 'mediational interaction (Klein 89): the mediation of intent and reciprocity, of meaning, of transcendence, of a feeling of competence, of behavioural regulation, and of emotions.

is a need to develop a clearer administration and standardisation of LPAD, but not necessarily in the same form as with traditional tests.

In his day, Feuerstein was a student of Jean Piaget in Geneva. Lebeer and Sasson (1997) place Feuerstein in relation to Piaget because he expanded Piaget's theory of the cognitive development in children and youth by adding a *social interactional* dimension, which he calls the 'mediated learning experience' and which he in his own theory considers to be, as mentioned, a *central* determinant for cognitive development.

Campione and Brown's approach

The third approach that I will discuss here was developed by Campione and Brown, first at the University of Illinois, and later at Berkeley University of California.

An important theoretical premise behind this approach is Vygotsky's theory of socio-cultural development and socially mediated learning – including his theorising on the zone of proximal development. Furthermore, their approach has been influenced by research literature on teaching/instruction and by their own studies on metacognition (Lidz 1991, p. 28).

The development of their approach has roughly served a dual purpose (Campione and Brown 1990): *First of all,* it has been a matter of developing tools to be able to identify potential underachievers/children who struggle with academic learning or the learning of subjects in school. Much of their previous research on dynamic testing is concentrated on this. Their motivation here was that they considered testing that only considers products of previous learning (cf. traditional testing procedures) to be in danger of underestimating the capacity of children who have not had the opportunity to acquire 'rich' potential learning experiences, either generally speaking or in a specific field. *Second of all,* in their later research, they have aimed towards developing methods that integrate testing and instruction.[15]

The approach can be described as a *graduated prompting*[16] *procedure* (Jitendra and Kameenui 1993), but has also been described *as assisted learning and transfer* (Ashman, and Conway 1997), or as *guided learning and transfer* (Campione and Brown 1990).

This approach also includes an experimental testing – intervention – re-testing procedure, but in this case, it also entails an assessment of the test person's ability to transfer knowledge acquired in the training sequence to the solving of *similar* tasks (*near* transfer) and more *different* tasks (*far* transfer) within the same field. The ability to transfer newly acquired knowledge to new situations is regarded as important because it is seen as a good indicator of how the person will benefit from further teaching.

Thus, the graduated prompting procedure focuses on determining an individual's learning potential and the transfer efficiency of learning both in general and in specific proficiency areas, such as early reading and the understanding of reading, and on an early level of mathematics when it comes to solving text problems. A considerable part of the material that is used has great similarity with the non-verbal tasks that are found in regular intelligence tests, and it too includes a variant of Ravens Matrices. However, as opposed to Budoff and Feuerstein, Campione and Brown, as mentioned above, also include tasks within reading and mathematics in their later research, tasks on which they also use their graduated prompting procedure.

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[15] Campione and Brown have developed a teaching method ('reciprocal teaching'). The title refers to a reciprocal, interactive teaching methodology where participants in small groups systematically take turns as leader. The methodology is thought to contribute in the making of development zones (cf. Vygotsky) that can give support to people on different levels of competence.

[16] 'Prompt' can, according to Webster's New World Dictionary, Third College Edition (1991) among other things mean: 'an act of prompting; reminder, to help with a cue, to move or inspire by suggestion'. However, the word 'hint' is used by Campione and Brown to denote the steps given to the test person in the graduated prompting procedure, i.e. hint one, hint two, hint three, etc.

The first testing round is carried out to find or determine the initial performance level as well as the person's general intellectual ability. In the following training sequence one then starts with the tasks in which the person failed in the initial testing round, and uses the graduated prompting procedure as one helps the person solve the tasks. The order and the number of hints are not chosen at discretion in relation to different persons, but are determined on the basis of an analysis of what is acquired to solve the task. In other words, it is a standardised method.

The way in which the hints are given will be slightly different according to what tasks are at hand. A first hint will often involve telling the person that the solution was incorrect, followed by a request to try again. If the person still cannot solve the task, one can repeat this, and add a question that indicates the start of a solution. In this manner, one works through the order of hints through cooperation. If the person is still unsuccessful in solving the task, one arrives at a hint that involves explaining how to solve the task. If this still does not help, the next hint can involve concretely showing the person how one arrives at the solution, while explaining the reason for one's actions (Campione and Brown, 1990).

Subsequently, the number of hints the person needs to reach the solution of the tasks given is noted. This number then constitutes the score for the person's learning potential. The lower the score, which in turn reflects how much help was needed, the higher the person's learning potential is in the area that is tested. Campione and Brown comment on this:

> Note that the metric here differs from that used by several others interested in dynamic assessment, including Vygotsky, in that it is not *how much improvement* one can bring about through intervention, but rather *how much aid* is needed to bring about a specified amount of learning
>
> (1987, p. 90).

In other words, the focus is not on the width of the zone of proximal development, but rather on what help (the number and types of hints) is required to solve the tasks. A re-test corresponding to the initial test is then administered as a basis for evaluating possible improvements in what the person can perform without assistance. Because the method of graduated prompting is also used in relation to the understanding of reading and the solving of text problems in mathematics, one will be able to determine the person's learning potential in these areas (as far as the procedure reaches), and at the same time, the results one gets via the prompting procedure can be directly relevant to and give consequences for the educational programme that will be developed for the person.

Ashman and Conway (1997) see the quantification of the results within this approach as an advantage, while it is criticised by others. Lidz (1991), for instance, questions what the hint score actually represents and the fact that this focuses on quantity rather than on 'the nature of the intervention that is relevant to learning' (p. 30). She also questions what type of tasks the graduated prompting procedure is relevant to, as she points out that thus far, the tasks related to academic learning have been limited to an early functional level. She also points out that when more complex academic content has been involved, the applied procedure has been of a more clinical character (cf. reciprocal teaching, footnote 15).

Ashman and Conway (1997) state that the graduated prompting procedure approach seems to have been followed-up to only a small degree in later years, whereas research on and the use of the more clinically oriented approach called 'reciprocal teaching' is still widespread.

CULTURAL BIAS IN TESTING AND DYNAMIC TESTING DISCUSSED IN A CROSS-CULTURAL PERSPECTIVE

Already shortly after the start of the 20th century, one became aware of problems connected with tests across different cultures and cultural groupings, and especially from the 1950s there has been an increased focus on these problems (Anastasia 1988).

At the core of this is an acknowledgement that no tests (based on traditional testing procedures) are in themselves culturally neutral or culture fair, in the sense that persons belonging to different cultures as a group have the same possibilities when testing is used across cultural belonging.

This critique has especially been directed at intelligence testing, but cultural bias (systematic mistakes or 'unfairness' as a consequence of cultural differences) also seems relevant for personality testing. As a central argument in this connection, it is emphasised that psychological tests often clearly favour and reflect European-American middle class values (Groth-Marnat 1997).

To remedy the problems of cultural bias in testing, there have been constructed many tests that explicitly aim to be (more or less) culture fair and thus cross-culturally applicable.

Examples of some such frequently used tests include Leiter International Performance Scale, Raven's Progressive Matrices (RPM)/Coloured Progressive Matrices (CPM) and the Goodenough-Harris Drawing Test.

What particularly characterises these tests are little or minimal verbal instruction and a so-called non-verbal task and answer form.

Behind this lies a presumption that non-verbal tasks might be said to be more culture free or culture fair.

This assumption is, based on the knowledge acquired on this field, debatable. According to Sattler 1992[17], research seemingly indicates that most of these so-called culture fair tests show no greater validity for minorities compared to non-minorities.

A growing body of research actually indicates that non-verbal tests can in fact be more culturally charged than verbal tests. Studies from several countries between a great variety of different cultural groups have proved that there are greater group differences within performance tests and other non-verbal tests than within verbal tests (Anastasia 1988 p. 359).

As for the use of dynamic testing procedures, Lidz (1997.2) argues that such procedures seem to represent a promising contribution to the testing of culturally diverse learners when it comes to obtaining information relevant to educational measures. Lidz claims that while traditional tests and testing procedures might be important when it comes to e.g. uncovering whether a child is at risk of underachieving, they have their limits when it comes to generating both explanations and suggestions for the content in educational programmes.

Under the paragraph heading 'Dynamic assessment as a non-discriminatory procedure' Lidz (1997.2) discusses some elements that might support an understanding of dynamic testing procedures as suitable for the testing of children with different cultural backgrounds. In short, the elements are these:

1) Dynamic testing involves reduced reliance on previous knowledge and experience.

2) To a somewhat different extent depending on the specific dynamic procedure that is used, the focus is on a positive development of the child's competence and on the discovery of what works (or does not work) in a pedagogical connection – rather than on deficiencies, classification and the assessment of the child's placement within the school system.

[17] Sattler, J. M. (1992). *Assessment of children.* (3. ed. rev.). San Diego: Author 1992. Quoted in Groth-Marnat 1997 p. 57.

3) The interaction within dynamic testing procedures will most likely harmonise considerably better with the interactive 'styles' and the different experiences of people who are learning and who have different backgrounds (implicitly compared to traditionally based testing procedures).

Despite this argumentation, Lidz does not claim that dynamic testing represents an answer to all testing needs, or that this form of testing procedures should not be the subject of constructive criticism.

GENERAL EVALUATIONS OF DYNAMIC TESTING WITH A LOOK TO THE FUTURE

Several people have drawn attention to limitations or weaknesses connected with dynamic testing and have pointed out how to reduce such limitations. Some of this is already mentioned in the presentation of the three dynamic approaches.

Despite a thorough analysis that results in a considerable critique of dynamic testing in its current forms, Grigorenko and Sternberg conclude that:

> … the general claim made by dynamic-testing promoters and developers seems to have been justified, at least to some extent: dynamic testing does provide data unique to this type of testing. (1998, p.104).

They finish with a summary saying that the development of dynamic testing has produced interesting paradigms and ideas as well as promising discoveries. They ask whether it will be possible to implement this potential as a direction within psychological testing characterised by concurrent results and techniques that may produce information beyond data discovered by conventional testing. They finish by expressing the belief that dynamic testing in the last instance will be able to face these challenges and thus become a great asset to psychology as a profession.

Haywood and Tzuriel (1992) point out that a lot remains before the many different approaches within dynamic testing, seen as one, will be either validated or discredited. Even though they discuss several unsettled issues that they claim need considerable more research, they choose to conclude that in general, dynamic testing (or 'Interactive approaches to psychoeducational assessment' as they call it) seems to provide useful and expanded alternatives to traditional standardised, prescribed testing. Nevertheless, Haywood (1997) claims that dynamic testing should be seen more as being complementary to traditional standardised testing and not usually as a methodology meant to replace this. It will be possible to use dynamic testing and traditional standardised testing in combination to discover different kinds of information.

According to Lidz (1997.1), dynamic testing cannot be considered or evaluated as if it were just another form of psychometric testing. Rather, it represents a genuinely different approach, not only because of the different methodology, but also because of the basic assumptions on which it rests. The information acquired by this is different from information acquired through other procedures, and it increases the possibilities to predict and describe the learning processes in pupils so that it becomes directly relevant for subsequent teaching programmes. In line with this, Lidz concludes that dynamic testing is a meaningful contribution to the repertoire of accessible assessment methods. However, since dynamic testing unarguably demands more time than traditional testing, Lidz (1991) believes that it is neither efficient nor relevant to test all referred children in a dynamic manner. Instead, the

approach should be selectively used for answering specific diagnostic questions, cf. the discussion of groups presumed to profit from dynamic testing below.

WHO WILL PROFIT FROM DYNAMIC TESTING?

According to Grigorenko and Sternberg (1998), the most important use of dynamic testing has been in connection with certain disadvantaged children who have already tested very badly on conventional and static tests. This relates to the fact that this category of children is given the opportunity to demonstrate potentials that are likely not to be discovered through a more traditional testing procedure.

Hamers and Resing (1993) claim that the advocates of dynamic testing believe that such a procedure is particularly well suited for deprived children, for children with learning difficulties, for children with anxiety for underachieving, and for children from ethnic minorities. It is also argued (Hamers and Ruijssenaars 1997) that one of the central tasks of dynamic testing is to find children who have academic problems, a factor that will be shared by all the groups mentioned above, as well as to describe stronger and weaker qualities in a manner that might contribute to determine what educational steps to take.

CHALLENGES AND DILEMMAS IN THE SCHOOLING OF DYNAMIC TESTERS

Dynamic testing seems to be a well-known term in literature within (school) psychology in the U.S. and the subject seems to be well covered in lectures in school psychology. Despite this, it turns out that direct teaching of the approaches discussed here only occurs to a small degree. The consequence of this is that few people acquire the knowledge of how to conduct dynamic testing through their basic education (Lidz 1992). A similar survey is, as far as I know, not conducted in Norway within the institutions that educate qualified counsellors in educational psychology or with practising counsellors within the psychoeducational counselling service. Here, the starting point is probably a lot more premature, because there has been little discussion of dynamic testing versus more traditional testing within the educational institutions and the psychoeducational counselling service.

In general, the basic training within the vocational education for psychologists and other counsellors within educational psychology is very problematic because it involves choosing subjects and activities in very extensive fields. There is always a lot more to learn than what can be learned efficiently within the education period, and dilemmas arise. In line with this, Meyers (1987) points out that schooling in dynamic testing presents unique dilemmas because it often promotes ridding oneself of old ideas and techniques, while at the same time, it demands insight into new theories and approaches. The dilemmas that he particularly underlines represent some of the challenges one faces when considering teaching more traditional testing procedures versus teaching dynamic testing. The dilemmas are reproduced here only through Meyer's own summary of them: *Freedom versus constraint given to trainees in experimenting with instruments and techniques, scientific versus practical orientation, labelling versus intervention, process versus product, observation versus teaching, and realistic versus idealistic approach.*

A DYNAMIC INTERPRETATION OF TEST RESULTS, AND THE ADMINISTRATION OF A DYNAMIC TESTING PROCEDURE

The results of *traditional tests*, which are administered as prescribed, can be interpreted more or less *statically* or *dynamically* depending on what view one holds when it comes to the learning and development of children and youth. The basic view behind a static interpretation is that abilities in the form of readiness for learning are predominantly given and unchangeable, so that educational steps will have little influence on the development curve the child has followed up until the time of testing.

The basic view behind a dynamic interpretation, however, is that abilities in the form of readiness for learning are largely acquired (or constructed) from the prevailing socio-cultural contexts (including the prevailing learning conditions) that surround the child.

The advice concerning educational measures, based on test results, will most likely vary considerably depending on whether the expert has a static or dynamic view of abilities and learning possibilities.

The other part of this paragraph heading refers to the administration of tests based on a more or less developed dynamic testing procedure. On the one hand, one will here be able to differentiate between *traditional tests administered in an approximate dynamic way as e.g.* WISC-R, ITPA[18], Ravens Matrices and Bender Visual Motor Gestalt Test.[19] On the other hand, one will find *tests that are originally developed from an idea of dynamic testing as a procedure*. Some examples here are Budoff's testing material, Feuerstein's LPAD, the tests of Brown and Campione, as well as more recent dynamic approaches and tests such as Swanson's 'Cognitive processing test'[20], Lidz' (1991) 'Curriculum-based dynamic assessment approach'[21], Lidz and Greenberg's 'Group dynamic modification of the cognitive assessment system'[22] and Guthke and associates' 'Learning tests' (1996)[23] – in addition to two Norwegian tests that will be discussed later in this article.

If the aim of the testing is to find a child/pupil's possible potentials and to test what form of support or educational arrangements can promote development, it will most likely *not* be enough to follow a dynamic testing procedure. Equally important are *the basic assumptions* about children's possibilities to develop via positive learning conditions, and the *knowledge* about such conditions that makes out the basis for counselling.

As of today there a few tests adapted to Norwegian conditions that are developed with dynamic testing in mind. However, two notable exceptions are one test of a mathematic character and one that concerns reading and writing skills. These will be described further down.

Until more such tests are made, one has to make do, perhaps, with a *more dynamic interpretation of traditional* tests, *administered*

a) as prescribed, or
b) in an approximate dynamic manner

Later in this article I will present examples of more *dynamic interpretations* based on the two fundamentally different ways of conducting testing.

Since a dynamic or static interpretation of test results is, as already mentioned, most likely dependent on the test leader's view on abilities and intelligence, I will first focus on an ongoing debate concerning the concept of intelligence.

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[18] A linguistic test - Illinois Test of Psycholinguistic Abilities.

[19] See Grot-Mamat (1997) for an updated discussion. Bender is here described as a neuropsychological test for assessing a person's visuoconstructive abilities.

[20] Thoroughly discussed and evaluated in Grigorenko and Sternberg (1998), but also presented by Lidz (1997).

[21] Represents guidelines and principles for how to dynamically test achievement levels, cognitive processing and potential in different 'subject' areas depending on the reason for the pupil's referral.

[22] Discussed in Lidz (1997). This is a group test which can be administered to smaller groups and to full classes from years 1 to 3. Built on, among other things, 'The PASS Theory of Intelligence', which represents a Luria-based understanding of mental processing (Das et al. 1993) with several modifications.

[23] Several tests with content from several specific learning areas. Grigorenka and Sternberg (1998) give them a good evaluation when it comes to the predictive power for individuals with an IQ below the average. Haywood (1997) remarks that Guthke's procedures are closer to the psychometric tradition than most other approaches within dynamic testing.

THE PROBLEMATIC CONCEPT OF INTELLIGENCE

Throughout its almost hundred years of history, intelligence testing has led to repeated debates within pedagogy and psychology. In the 1960s and 1970s, there was a particularly strong resistance to such testing in the US within what was called 'the anti-testing movement', which was critical as to whether such testing should take place at all.

As of today, there is no singular understanding of intelligence in the form of a universally accepted definition. Instead, many researchers and test constructors have throughout the years presented their own definitions that vary a great deal in content. Because reproducing examples of different definitions and discussing similarities and differences among these is not among this article's goals, I will not set out to do this. However, a quote from Erlich and Feldman from 1969 represents a very good summary of what these definitions often stress, and is therefore included here:

> No definition of intelligence has been adopted universally. In general, definitions stress either the ability to adapt to the environment, the capacity to learn, or the ability to think abstractly. Like the word *love*, *intelligence* remains a term we all have a feel for but cannot quite pin down.
>
> (quoted by Bryant 1997, p. 16)[24]

As previously mentioned, it is possible to interpret tests more or less *statically* or *dynamically* according to one's view of intelligence, abilities and the possibilities to influence the individual's development through training conditions. In this connection, debaters have often claimed a scientific approach as they give reasons for their views based on research as activity.

In a book on the philosophy of science, Fjelland (1999) shows how referring to scientific facts often gets a similar status as references to the Bible would have gotten in the Middle Ages. As an extension of this, he stresses the importance of being aware of and having a critical view of our sources for knowledge. In this connection he refers to the book *The Bell Curve.*[25] *Intelligence and Class Structure in American Life* (Herrnstein and Murray 1994). Even though the book in many ways seems scientific because of its presentation and discussion of extensive empirical material, it provoked great reactions that have still not died out. The main cause of the reactions was to be found in the fact that *The Bell Curve* ends up claiming that intelligence[26] is mostly genetically determined and therefore to a great extent hereditary. A statistic connection between intelligence and higher education, high income and high positions is pointed out, and it is claimed that there is a statistic connection between crime, poverty and low intelligence. Last, but not least, the book claims that the coloured population on average has lower intelligence, which in turn is connected to crime and poverty. According to Fjelland, Herrnstein and Murray considered these findings to be facts, and he continues:

> They believe, among other things...that using money to obtain greater equality is of no use, because intelligence is chiefly genetically determined. They believe that instead, society has to be organised so that one openly

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[24] Bryant, B.R. (1997). Intelligence testing. I R. L. Tayler (ed.). *Assessment of individuals with mental retardation.* San Diego: Singular Publishing Group

[25] The Bell curve, the Gauss curve or the normal distribution curve.

[26] Intelligence is here understood as IQ scores obtained through intelligence tests.

> acknowledges that genetically determined differences exist. Among other things, they suggest that more money should be spent on prison administration and on protecting more affluent areas against crime.
>
> (1999, p.19)

The book about the Bell Curve did, as mentioned, provoke great debate[27] both within academia and in the public through the mass media. Needless to say, it was received in different ways. On the one hand, it was more or less embraced by circles that had the same social political views, and was presented as scientific evidence of how social class affiliation can partly be understood in light of intelligence and race. From the groups who disagreed with the book's scientific value and the conclusions it drew, came different reactions. Some chose to ignore it, while others ridiculed the authors of the book and accused them of being racists. A third alternative was an academic response from experts and researchers who discussed the empirical data of the book, supplemented it with other empirical data, and who countered the book's conclusions on the basis of research. The book *The Bell Curve Wars* (Fraser 1995) is one of several such examples. In this, 19 different American experts from different disciplines (e.g. psychology, biology, pedagogy, law, sociology etc) discuss the book's content and counter its central premises, each in their own way. Another serious book that counters *The Bell Curve* with 'heavyweights' from different fields is *Intelligence, Genes, and Success. Scientists Respond to the Bell Curve* (Devlin et al. 1997).

In Europe, considerable discussion about *The Bell Curve* also appeared. The book *Is Intelligence Modifiable?* [28] (Matinez et al.1997) is a product of such a discussion and was the direct consequence of a conference held in Madrid in December 1995. The conference was arranged by EAMC[29] and focused on the issue of whether intelligence can be considered to be modifiable, i.e. if it is possible to influence it through adjusting environmental conditions in a broad sense, including educational and psychological measures. At this conference, the issue was thoroughly discussed by experts from both Europe and the US. The answer to the conference's main issue/question was a definite yes, meaning that intelligence is understood as being modifiable, though intelligence here too was probably perceived in different manners. The concept of intelligence was also in itself the subject of discussion because it does not seem to have a functional value as a basis for thinking about the content of modifying steps. Alternative concepts such as *ability, learning potential* and *prerequisites for learning* were discussed as concepts that could replace or function as alternatives, but the discussion did not result in anything tangible.

In line with what is claimed above in contrast to some of the conclusions in *The Bell Curve*, Anastasia and Urbina, in their authoritative book on psychological testing (1994)[30], claim that:

> …one empirical fact is well established: The IQ is not fixed and unchanging; and it is amendable to modification by environmental interventions.

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[27] A similar debate also occurred after the American psychologist Arthur Jensen, in an article from 1969, claimed that the academic achievements of coloured pupils were on the average lower than those of white pupils due to biological causes, i.e. because white people generally had higher congenital intelligence. In line with this, Jensen believed that special means to improve intelligence and the profit of education, such as letting black pupils go to school in 'white' areas, would have only limited influence on the factors mentioned.

[28] One of the chapters in this book is a Norwegian contribution: Nyborg, M, Nyborg, R.H. & Hansen. (1997): 'Concept teaching as a strategy to prevent or reduce learning disorders'.

[29] European Association for Mediated Learning and Cognitive Modifiability.

[30] An important and well reputed book on psychological testing in which Anastasia stands as the sole author in previous additions from 1954, 1961, 1976, 1982 and 1988.

(p. 298)

Anastasia and Urbina prefer to use *developed abilities* as a general term that implies that *the qualities that are being measured* through tests of general intelligence, via more general and specific aptitude tests, and via tests of achievement in different disciplines, can be *developed, modified or learned.*

Anastasia and Urbina represent a dynamic view of abilities and intelligence – an understanding that is obviously the most dominant one these days.

A DYNAMIC INTERPRETATION OF TEST RESULTS BASED ON TRADITIONAL TESTING PROCEDURES

In Norway, Magne Nyborg has argued that it should be possible to interpret the results of traditional aptitude tests, administered as prescribed, *far more dynamically* than what he claims has been common. However, this requires that the test interpreter has not been 'blinded' by the belief in *static* ability, i.e. that the tests measure something that is static or unchangeable in the child or pupil. Abilities can, claims Nyborg, be understood as an ambiguous term that has also been used, and is still being used, in a static sense. On the other hand, it is possible to understand the word aptitude:

> …also as a term for a present capacity that is, to a high degree, *learned*; a capacity for perceiving, learning, remembering, thinking, solving problems, acting etc. without considering to what degree this capacity is rooted in and reflects also original abilities or potential.
>
> (1980, p. 259)

The fact that aptitude in this sense *can and must be learned*, also through upbringing and education, is, claims Nyborg, of great importance for educational and psychological counselling. Such learning demands that the person's *readiness for learning changes* continuously.

Furthermore, Nyborg argues that if the psychoeducational counsellor has conducted a reasonable (traditional) intelligence test and ends up with findings of a lower intelligence score (from 90 points or lower), and if this result corresponds with the child's functional level in many other connections, this should be a signal that the following advice should be given concerning the educational offer:

> The child/pupil has to be given systematic language training in a number of *instrumental language functions*, where the functions of *concepts* – such as components of meaning or understanding in the language – are strongly emphasised.
>
> (1980, p. 261).

This should preferably start in late pre-school age in the form of preventive and diagnostic teaching (Systematic Concept Teaching and Skill Teaching) that can contribute to a *positive change with regard to prerequisites for learning in terms of language skills and motivational factors* (cf. Nyborg 1994, 1995, 1996 and Hansen 1991 and 1999). Such teaching can hinder or reduce the experience of underachieving and any possible accompanying behavioural problems. It is important to be aware that Nyborg does not argue against other types of teaching as components in an adapted educational programme, while he

clearly states that the recommended programme in necessary cases must be ensured considerable space.

Nyborg gives reasons for the proposed advice based on, among other things, a content analysis of some commonly used intelligence tests[31] and on developmental psychology theories and descriptions of development (Bruner, Piaget and Vygotsky). The conclusion of the content analysis of the intelligence tests mentioned is that these tests to a very high degree reflect the concepts and linguistic skills that the person has previously learned in such a way that they can be transferred to the more or less new tasks that are solved during testing. Those with low scores on such tests (given that the result is not seen as a consequence of test anxiety, lack of motivation for solving the tasks etc.) can therefore be assessed to fall short on a *conceptual* level, something which qualifies for an adapted variant of Nyborg's suggestion for educational measures.

In my view, Nyborg's way of interpreting results from more traditional intelligence tests represents an example of a more dynamic interpretation of such tests than what is more common.

AN APPROXIMATE DYNAMIC ADMINISTRATION OF TRADITIONAL TESTS

An import point in this article is that educational-psychological counsellors – in addition to administrating cognitive tests such as WISC-R and the Raven test, to mention two of the more famous ones – should also practice a more *dynamic administration*, and hopefully have the academic insight and clinical judgement that make a *dynamic interpretation* possible. This also applies to tests in fields such as mathematics, reading/writing and so on. This is not a new perspective, for that matter. Judging from the lack of a debate in academic journals and books concerning the role and content of testing in Norway, it is probably safe to assume that this perspective has not had a breakthrough in practice.

The need for more a dynamic testing procedure – in addition to traditional procedures – is promoted not only by *critics* of more traditional testing procedures, but is also maintained, to a certain degree, by among others Kaufman, in his 1979 book *Intelligent testing with the WISC-R*. Several places in this book, Kaufman discusses the legitimacy of a 'testing the limits' procedure in cases where the tester is in need of additional information after the standardised administration has been followed.

Kayser, who mainly builds his handbook (1999) for interpretation of WISC-R on Kaufman's theories and the previously mentioned book from 1979, follows Kaufman in pointing out that it is sometimes necessary to conduct a secondary/supplementary testing where one tests the limits of the child's knowledge ('testing the limits') in order to get a clearer idea of the child's cognitive abilities and difficulties. When the results of a 'testing the limit' procedure implies that the child has normal or better intellectual abilities than what was indicated in the previous WISC-R profile, then this is also indicative of the child's intellectual potential and possibilities. When interpreting the results, such additional information will constitute an important foundation for giving advice concerning educational measures.

Keyser also discusses examples of how to test the limits of the child's knowledge for each subtest[32] (WISC-R). Here is the example from the subtest *information*:

> The question can be rephrased so that it is easier for the child to understand what information one is after. It can also be useful to ask the question in the third person: "What does your mother have to do to make the water boil?" Or

[31] WISC-R, Raven's Matrices, Leiter international, the Stanford-Binet test.

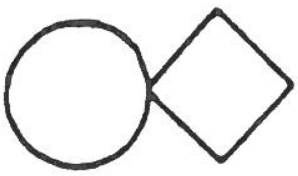
[32] Joel Meyers (in Lidz, 1987, p. 412,) gives a detailed instruction of how the tester can implement a 'thinking out loud' procedure when attempting to solve the problems in the subtest *dice pattern* (WISC-R), as part of a dynamic testing procedure.

> one can ask the question in a simpler manner: "What season do we have now?" or: "When is the holiday?" and when the child answers correctly: "OK, tell me about the other seasons."
>
> (1999, p. 19).

Here it should be added that in addition to the relevant questions, a more general conversation with the child about the subjects that form the basis for the different questions will contribute to ascertain to what degree the child has acquired the relevant information units.

When it comes to Bender Visual Motor Gestalt Test, which is scored by the number of errors/mistakes, a copy of *figure A* made by the child/pupil without help[33] may look like this.

The stimulus figure A



The attempt to copy

A dynamic procedure will here for example include a conversation with the child – after he/she has tried copying the figure – that aims to determine what kind of help the child needs to be able to copy the model more optimally. The tester helps the child analyse and name figure characteristics, and to find a possible copying strategy by asking questions such as: How many figures do you see here? What shape are this figure and the other one? (Alternatively: Is this a square, a triangle or a circle?). What size do they have, compared to each other? (Alternatively: Are they the same size, or is one figure bigger than the other?). Further questions may concern the placement of the figures, whether they touch each other or not, which one is the easiest to draw first etc.

The procedure can also entail an explanation of the performance and a modelling of it, or possibly a combination of these, by having the tester copy the figure while he/she verbalises what he/she is doing etc.

A MATHETMATIC TEST AND A READING/WRITING TEST DEVELOPED AFTER PRINCIPLES FOR DYNAMIC TESTING

Olav Lunde (1997) has developed assessment material in two parts intended for use on children in the 3rd and 4th grade in the Norwegian school: One part for surveying and one part for assessing prerequisites for learning in 14 different subjects within mathematics. The material is applied in line with the principles for dynamic testing. The intention is that the material will provide the basis for making a statement regarding the prerequisites for mathematic learning and the pupil's learning potential – together with other forms of specified information. The final goal is that this information will form a basis for developing and recommending an adapted special educational programme.

Lunde uses a general prompting procedure with six levels. These range from telling the pupil that the answer is wrong, so that a new attempt is desirable, via hints giving more and more help, until the final prompting registration, which means that the pupil is unable to

[33] An example from one of my own previous research projects (A. Hansen, 1991).

do the task even with help. The less help is needed to solve the task correctly, the lower the prompting score and the higher the assessment of the learning potential.

This prompting procedure and the registration method are in accordance with Campione and Brown's, which were discussed earlier in this article.

Since the procedure is also followed up in the part of Lunde's assessment material that is concerned with the assessment of prerequisites in 14 different subjects within mathematics, the scheme seems very interesting for developing the content in relevant special educational programmes.

In Denmark, Frost and Nielsen (1996) have developed material (IL-basis) that aims towards bridging the gap between assessment of reading and the teaching of reading. This work is meant to take place towards the end of the first grade, in the second and possibly the third grade. A Norwegian adaptation of IL-basis is being tested, and a handbook for the material in Norwegian is expected to be completed by November 1999. The testing principle that is followed, and which among other things is built on Vygotsky's theorising on the zone of proximal development, is based on what the authors call an *expanded testing concept* (Frost 1999). This corresponds to the testing approach this article denotes as dynamic testing.

The material consists of a group test and an individual part. During the individual part, the pupil's actual accomplishment level is uncovered, and subsequently, the tester moves on to testing the pupil's potential level (cf. Vygotsky). In this connection, the tester uses certain support strategies that are structured by level in connection with the different tasks the pupils are given. This entails supporting the child's own functional working strategies as much as possible, following the principle of providing as little help as possible. In this way, the aim is to discover the pupil's potential and to ascertain what sort of help the pupil will benefit the most from in a teaching programme.

THE DEBATE THAT DIED

In Norway in the early 1990s, an attempt was made to initiate a debate, to teach and to share experiences concerning dynamic testing at the forerunner of the Institute for Special Education at the University of Oslo. The focus was on dynamic testing in the form of Feuerstein's theory and on practice represented by David Tzuriel, one of Feuerstein's colleagues, who also demonstrated this type of testing with younger children based on the use of his own material.

A suggested follow-up of this attempt, with possible further schooling and sharing of experiences, petered out, as far as I know – though the reasons for this are not apparent.

Even though dynamic testing is extensively discussed and validated in the rest of the world by now, surprisingly little of this is discussed in Norwegian journals and books. However, an informative article by Birkemo from 1996 is worth mentioning.

A central conclusion in this connection is that a debate concerning dynamic testing versus more traditional testing perspectives should now be *initiated* by the circles that educate future experts for the educational-psychological service. This seems to be highly appropriate in light of the research that exists internationally on dynamic testing.

CONCLUSION AND POSSIBLE IMPLICATIONS FOR PRACTICE

The development of dynamic testing procedures, represented by different approaches, has been rapid on an international level in later years and seems promising thus far, even though much research still remains to be conducted in the field. What consequences, then, may this have for educational and psychological assessment and counselling?

As of today, it is probably most realistic to imagine an approximate dynamically oriented testing procedure more as a supplement than as an alternative to traditional testing in connection with assessment and counselling. The main reason for this is that there have hardly

been developed any suitable testing instruments for such use in our country. The condition for a more satisfactory dynamic testing procedure will be that more tests that are developed specifically for this purpose become accessible.

Nevertheless, in fields where available tests developed after the principles mentioned above already *exist*, these will be profitable alternatives for persons who are particularly expected to profit from such tests.

In line with the above, experts are encouraged to administer traditional tests also in an approximate dynamic manner, as exemplified previously. This can give useful additional information about the test person's potential, discover possible functional working strategies and indicate favourable training conditions, thus having direct influence on the counselling in relation to individual teaching programmes. As such, this will provide supplementary information to that acquired through traditional testing.

In this way, one will be able to reduce the limitations that traditional testing has been criticised of and that are likely to reduce the actual value such testing has in relation to the assessment of and counselling in relation to special educational measures.

A transition to a more supplementary dynamic way of working will most likely demand more time from the expert. It also demands considerable professional pedagogical insight. At the same time, one can most likely expect that the result will make out a foundation that contributes to improving the quality of advice given in relation to possible special educational arrangements.

For a long time, the use of more traditional testing procedures will probably dominate without being properly challenged through access to alternative tests worked out in line with the principles of dynamic testing. In light of the research that already exists, a supplementary approximate dynamic use of traditional tests will clearly be advisable.

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