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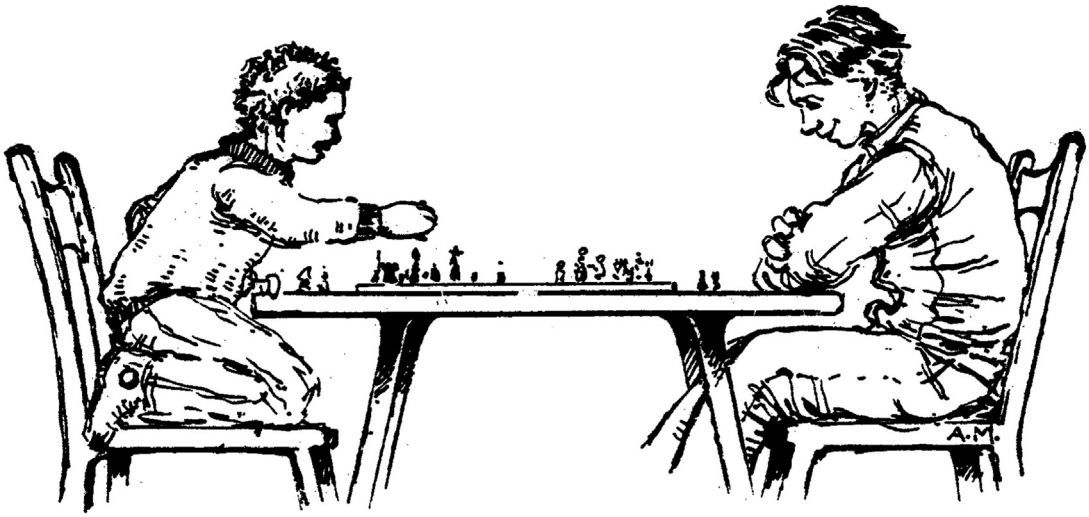

Drawing by Anton Marin, Belgium. Symbol of the dialogical nature of Dynamic Assessment

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SPECIAL ISSUE ON DYNAMIC ASSESSMENT AND INCLUSIVE EDUCATION

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Cover drawing by Jennifer, a child with Down syndrome, attending the
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COGNITIVE ASSESSMENT AS A TOOL FOR EXCLUSION OR INCLUSION? EDITORIAL

JOSEPH LEBEER[1] & RÉKA JÁNOS[2]

Inclusive education is a worldwide movement, based on a human rights issue: every child, whatever its level of difficulties, should have the right to individually tailored high quality education together with more able peers and not be excluded from the mainstream because of a certain learning difficulty or disability. In 1994, there was an important world conference in Salamanca (Spain), under the auspices of the UNESCO, where Ministers of Education of 180 countries declared that "Mainstream schools are the best places to develop social and cognitive competencies for all, provided a welcoming attitude for differences is created" (UNESCO Salamanca Conference 1994). They made a pact to make substantial efforts to realize inclusive education. Inclusive education has become official policy promoted by the United Nations as well as by the European Union (non-discrimination clausules in the treaty of Maastricht, Amsterdam & Madrid).

However, 10 years after "Salamanca", inclusive education certainly is not realized in every European country. In many countries, it is still in an embryonic phase, or even worse, meets opposition from many sides, special education and mainstream education. Realizing inclusion is a grass-roots process of creating culture. This involves painstaking work on many levels: families, schools, counselors, teachers, and policy and decision makers. It necessarily takes time.

There is a fundamental paradox in the European Union's educational policies. On the one hand it wants to become more competitive on the world market and become a "knowledge economy". The education system is not well adapted for this objective. How can one do this without "selection" of the "talented"? Our modern society calls for the development of basic cognitive skills for all people, to adapt to social and technological changes. Without a minimum of cognitive skills, one

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cannot access the many aspects of information, technology, economic life and social relations. In 1995 European commission's White Paper 'Towards the learning society" , stressed the need to transform educational systems and teaching styles. It mentions a number of measures to be taken to increase the qualification levels of all and to prevent drop-outs. That involves, among other measures, teaching more transversal, general thinking skills. Yet, despite scarce initiatives taken by the member countries' educational policy makers, the educational system continues to be very exclusive rather than inclusive and create huge amounts of educational drop-outs.

The problem of inclusion should be regarded in a wider perspective than organizing the disabled child's participation to the mainstream school. The real issue is about teaching children with widely varying differences, visible disability is just one of them. The present school system creates too many drop-outs. These are called the "educationally at risk pupils". Most of them come from poor socio-economic. There still is a 4x higher referral of children from poor socio-economic backgrounds to special education. This reinforces the vicious circle: poor schooling, poor employment, poor social opportunities, social exclusion, and repetition in the next generation. To keep them in mainstream schools, attitudes, organization and methods of teachers and evaluators need a radical change. 80% of the population of special schools has learning disability due to socio-economic deprivation, about 20% due to "organic" problems such as disability, brain damage, congenital malformations.

With the advent of the inclusive education movement, school psychology is faced with quite some new challenges. While the principle of the individually tailored educational program is inherently accepted, assessment principles and practices constitute a main barrier.

When a child does not learn well at school, or when a disturbance in the natural course of development is seen, usually the child is subjected to a series of tests, with the aim of finding out "what is wrong" and on the basis of that to plan an intervention. Psychometric testing tries to find the child's strengths and weaknesses and puts the child's level of functioning in a relative ranking as compared to "normal" peers. Other tests, such as developmental tests, neuropsychological or neurolinguistic tests, dig deeper to look at dysfunctions.

This is called the "classic testing paradigm". The outcome of it

being a series of labels which denominate "the problem":

Millions of children are being assessed in this way. The classic testing paradigm represents a real obstacle in the process of inclusive education. In countries which have adopted and promoted inclusive education as a policy in education, which have provided means for it, and have reorganized education in order to allow children with disability and learning difficulties to participate in mainstream education, there has not been a concomitant change in evaluation practices, which have often remained in the "old", i.e. static paradigm. This has often reduced inclusion to social objectives, with the special needs child's real educational needs hardly being met and remaining on a low level

Transforming the school system towards inclusive education requires a more *dynamic way of testing and evaluation*, based on a dynamic and ecological model of intelligence, which would become more oriented towards tapping the child's learning potential for modifiability

This special issue of the Transylvanian Journal of Psychology brings together some outstanding research and discussion papers of leading international authors who have pioneered in the field of dynamic assessment.

David Tzuriel (Bar Ilan University in Israel) opens the discussion by pinpointing the essential problems encountered in classic psychometric testing, and the alternative new paradigm of dynamic assessment, supported by a summary of his research findings. Reuven Feuerstein and his group of he International Centre for the Enhancement of Learning Potential contribute with two major papers: one describes the Learning Propensity Assessment Device (LPAD) in its historic perspective, its basic features and the various new tools and existing instruments that are part of it. The name change from "assessment of learning potential" to "learning propensity" indicates two major developments, i.e. that the LPAD is more than assessment of cognitive functioning, but also of leaning processes, including motivational and other contextual aspects; and that propensity has more a connotation of "change and modifiability" than potential, which could be genetically determined. Their other paper reports an extensive study of a population of Ethiopian immigrants, showing the cultural origin of cognitive dysfunction, as can be demonstrated by dynamic assess-

ment. Jo Lebeer illustrates the theory and practice of dynamic assessment with a more in-depth analysis of three case studies of children with disability who are included in mainstream schools, which show what kind and amount of mediation are needed to bring about signs of modifiability. His conclusion is that dynamic assessment is more valid to plan and follow up educational intervention, than psychometric tests, but it cannot and may not be used in a deterministic way to predict.

On the other hand, more quantitative aspects such as standardization, validity and reliability are treated by Lidz and Van der Aalsvoort in their report of a study with Dutch pre-school children on the usefulness of the Cognitive Functions Scale they developed, which can be used with content-based materials.

Ruth Deutsch discusses implementation issues, the impact of dynamic assessment on the development of educational services in the United Kingdom. Though the topic of dynamic assessment is mentioned in almost all formal psychological assessment trainings at universities in the U.K., to become a skilled dynamic assessment practitioner apparently requires a more thorough theoretical and practical training. The experiences in the U.K. are interesting for other European countries. So is Italy's experience with functional evaluation of children with disabilities, which is in itself dynamic, as is described by Lucia de Anna & Roberta Garbo, which serves as a basis for educational planning. In Italy all children with disabilities are included in mainstream schools and receive individually adapted education. This is a model useful to be transferred to other European countries. Finally Vera Pokorna describes the classic practice of assessment and special education as Czechia is slowly making steps towards inclusive education, thereby showing how "old ways of thinking" in terms of categorization of children with disabilities and a fixed concept of intelligence, impede a dynamic view on the child's learning potential.

The contributions in this Special Issue show that dynamic assessment has definitely gained scientific status and offers a serious, practical and viable alternative to psychometric testing. Not that psychometric testing should be banned; it can maintain its utility in population studies e.g. One cannot blame a quantitative technique because it has been abused. University psychology teachers, however, need to be aware of their responsibility what kind of paradigm of assessment they

will offer “the next generation”.

This Special Issue of the Transylvanian Journal of Psychology has been produced by the INCLUES Project, a European Network for the promotion of inclusive and cognitive education, with the support of the European Commission’s Comenius Programme. It really shows the result and the importance of networking by linking individuals and institutions who have expertise and those who are aware of the need to change and learn, in order to creating a momentum towards change.

The editors wish to thank the Inclues partners for their support, in particular Prof. Istvan Szamoskozi for making the production of this journal possible.

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DYNAMIC ASSESSMENT OF LEARNING POTENTIAL: A NEW PARADIGM

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Abstract: Dynamic assessment refers to an assessment, by an active teaching process, of a child's perception, learning, thinking, and problem solving. The process is aimed at modifying an individual's cognitive functioning and observing subsequent changes in learning and problem-solving patterns within the testing situation (Tzuriel, 2001). Dynamic assessment (DA) has been motivated by the inadequacy of conventional static tests to provide accurate information about the individual's learning ability, specific deficient functions, change processes, and mediational strategies that are responsible for cognitive modifiability. The need to develop DA tests have emerged because of criticism on static standardized tests. The main criticism on standardized static tests can be summarized in the following.

Main Criticism on Static Tests

Standardized static tests are bias towards minority groups and children with special needs. Children who come from low socioeconomic status families do not have adequate learning opportunities or efficient mediation within the family and therefore fail in academic performance or in standard tests. Their failure does not reflect lack of intellectual ability but rather lack of learning strategies, learning habits, and motivation to master cognitive tasks.

Static tests are characterized by selective administration procedures and selective interpretation of results among high-risk children. In other words, more strict procedures and stricter interpretation of results are used with children coming from low SES families or children with special needs than with children coming from high SES families or children with no special needs. Motivational, emotional, and personality factors are not well taken in static tests. Research literature and teaching experience shows that the motivational, emotional and personality factors are no less important than the "pure" cognitive factors. Unfortunately these factors are not given the proper attention in static tests or even totally neglected. Static tests lack information on learning and meta-cognitive processes. Those processes

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are of most importance in explaining the child's learning in the classroom and academic achievements. Teachers are interested in getting information on learning processes more than information on the relative standing of the student in comparison with peers. Very frequently static tests provide inadequate recommendations on remediation processes, specific interventions strategies, and prescriptive teaching. Many times there is a "communication gap" between teachers and psychologists. It is common to find that teachers do not understand the static test's terminology and how to translate it to actual day to day teaching. It is common also to find that psychologists do not have an experience with learning processes and cannot give specific recommendations to teachers as to how exactly teach the child with learning difficulties. In order to understand deeply how DA is used and how it can help children with learning difficulties we must understand the goals of DA. These goals are explained in the following:

Goals of Dynamic Assessment

The first goal is to examine the capacity of the child to grasp the principle underlying an initial problem presented to the child and solve it correctly. This goal is very similar to the static test's goal, although in DA the focus is on the specific deficient functions that explain the child's performance.

The second goal is to examine the nature and amount of investment required in order to teach the child the given principle. The examiner evaluates how much mediation and what type of mediation is required in order to teach the child. This is important in order to recommend later what type of mediation is required in the future and what is the intensity of mediation the child needs.

The third goal is to examine the extent to which the newly acquired principle is successfully applied in solving problems that become progressively more complex than the initial task. This goal is related to the level of internalization of learning and the amount of transfer the child's show in problem solving.

The fourth goal is to examine the differential preference of the child for one or another modality of presentation of the problem (i.e., pictorial, linguistic, numerical). Understanding of the modality preference may help teachers in the future in designing intervention strategies

and techniques.

The fifth goal is to examine the differential effects of different training strategies given to the child to improve his/her functioning. It is important to understand what type of mediation is more effective especially in relation to the type of task that is given. The effects are measured by using the criteria of task level of novelty, level of complexity, language of presentation, and types of operation (i.e., analogy, syllogism, spatial orientation).

Major Differences Between Dynamic Assessment and Standardized Testing

The major differences between static and DA can be summarized in the following points: (a) Goals of Testing, (b) Change in Nature of the Tasks, (c) Change in Test Situation, (d) Change of Focus: From End Products to Process Orientation, (e) Change in Interpretation of Results. These differences are compared in detail in Table 1.

Dimensions of comparison	Dynamic Assessment	Standardized Testing
Goals of testing	• Assessment of change • Assessment of mediation • Assessment of deficient cognitive functions • Assessment of Non-intellective factors	• Evaluation of static performance • Comparison with peers • Prediction of future success
Orientation	• Processes of learning • Meta-cognitive processes • Understanding of mistakes	• End products (static) • Objective scores • Profile of scores
Context of testing	• Dynamic, open, interactive • Guidance, help, and feedback • Feelings of competence • Parents and teachers can observe	• Standardized • Structured • Formal • Parents and teachers are not allowed to observe
Interpretation of results	• Subjective (mainly) • Peak performance • Cognitive modifiability • Deficient cognitive functions • Response to mediation	• Objective (mainly) • Average performance
Nature of tasks	• Constructed for learning • Graduated for teaching • Guarantee for success	• Based on psychometric properties • Termination after failures

Table 1. Major Differences Between DA and Standardized Testing

Who Needs Dynamic Assessment and When to Use it?

One of the frequent questions asked by psychologists, educators and parents is who needs DA and when to use it? Based on clinical experience I can say that we need a DA approach in the following conditions:

When standardized tests yield low scores

When standardized tests hover around margins of adequate cognitive functioning

When there are discrepancies between the child's aptitude and performance

When the child comes from a low SES, or culturally different background, or is linguistically different

When the child shows some emotional disturbance, personality disorder, or learning disability

Mediated Learning Experience (MLE) Theory

The major theory that guides my approach is the *Mediated Learning Experience (MLE)* theory developed by Feuerstein (Feuerstein, Rand, & Hoffman, 1979). Mediated learning experience is defined as an interactional process, in which parents, substitute adults, or peers, interpose themselves between a set of stimuli and the learner, and modify the stimuli for the developing child (Tzuriel, 2001). The MLE model (S – h – O – h – R) includes the mediator (h) who interposes him- or herself between the world of stimuli (S) and the child (O) as well as between the child (O) and his/her own response (R). In mediating the stimuli to the child, the adult may use different strategies such as alerting the child's attention: changing the frequency, order, and intensity of presented stimuli, relating them to familiar contexts, giving them meaning (e.g., "how beautiful is this flower"), and transcending the concrete aspects of the situation (i.e., " this type of flower grows in the spring time"). The O represents also the elaboration processes of the child after registering the information. The mediator is responsible also to mediate to the child how to convey the response and express it correctly. Many children who register well the information and even elaborate it efficiently have problems in expressing the product to the external world and need mediation how to do effectively. In a DA context (Haywood &

Tzuriel, 1992) the examiner mediates the rules and strategies for solving a specific problem and assesses the level of internalization of these rules and strategies to other problems of increased level of complexity, novelty, and abstraction. The mediator relates also to motivational aspects by arousing the child's curiosity, vigilance, and challenge. From a cognitive perspective, the mediator tries to improve and/or create in the child the cognitive functions required for temporal, spatial, and cause-effect relationships. The MLE processes are gradually internalized by the child and become an integrated mechanism of change within the child. Adequate MLE interactions facilitate the development of various cognitive functions, learning set, mental operations, strategies, reflective thinking, and need systems. The acquired and internalized MLE processes allow developing children to later use them independently, to benefit from learning experiences, to self-mediate in new learning situations, and to modify their own cognitive system. The MLE strategies given within test situations help examiners to facilitate children's learning processes, identify deficient cognitive functions, and give specified recommendations for development of cognitive structures.

Major Strategies of Mediation in Dynamic Assessment

1. Improvement of (deficient) cognitive functions. The examiner should know how to identify the cognitive functions required for solution of a problem in the test and the mediation needed to improve the deficient cognitive functions.

2. Preparing the child for complex tasks by establishing pre-required thinking behaviors. Establishing pre-required thinking behaviors is carried out often by using mediation for transcendence and for self-regulation. Adequate initial investment in preparing the child brings about reduction of mediation efforts in later more abstract and complex problems. It is common to find children who solve difficult advanced problems much easier than the initial easy problems. Mediation of rules and principles (transcendence) has a motivational aspect as the child becomes independent of the examiner's mediation, and enhances the child's sense of self-control. Mediation for self-regulation is carried out by focusing on systematic sequencing processes

especially in complex problems requiring an analytic approach. The examiner might ask the child to repeat the process of solution in order to crystallize the order of solution and to acquire feelings of mastery and efficiency.

3. Self-regulation by planning and organization of the solution. One of the most frequent deficiencies among low functioning children is impulsivity. Inhibition of impulsivity is done many times by decreasing the importance of time for performance. This is carried out by intentional delay of the child's response, longer exposure to the problem, systematic planning of the solution alternatives, verbalization of the problem, representation of the solution before pointing to the correct answer, and metacognitive analysis of the impulsive behavior. An efficient way of coping with impulsivity is by enriching the child's cognitive repertoire with thinking operations, comparative behavior, verbal tools, and hypothesis- testing techniques.

4. Enhancement of reflective, insightful, and analytic processes. Enhancement of reflective, insightful, and analytic processes is carried out by focusing the child on the relation between his or her own thinking processes and the consequential cognitive performance. The focus is not on the end product but rather on the thinking process in the context of the required operations, type of task, and situation. Creation of insight is important for generalization and transfer of learning. It can be done by a dialogue with the child before solving the problem ("What should we look at before we will start to solve this problem?") or after the solution ("Why did you succeed in solving the problem that was so difficult for you to solve before?"). The most efficient way of enhancing reflective processes is by presenting the child with conflicts, incongruent information, intentional ambiguity, and absurd situations, which will bring about a need to close the cognitive gaps.

5. Teaching of specific contents that are related to the task-specific context. Teaching of specific contents (concepts, terms, relations) is not for the sake of language enrichment but for further use in problem-solving tasks. For example, the use of the terms up, down, vertical, horizontal, diagonal, similar, opposite, and different is necessary for performing the mental operation. The examiner can deviate for a

short time from the task to teach and establish missing concepts and return later to the task to assess the performance efficiency and use of the newly acquired concepts.

6. Feedback on success or failure in the learning process. The feedback given, which is one of the cornerstones in DA, is mutual—from the child and the examiner sides. It is especially important with low performing children who are limited in their skills for giving feedback to themselves. This limitation is related to difficulties in self-correction and comparison of findings not only because of lack of knowledge and verbal tools of the children, but also because of lack of orientation to make comparisons. Many tests are based on the assumption that trial-and-error behaviors will eventually bring the child to learn the correct answer. This assumption is wrong with regard to low functioning children who are characterized by episodic grasp of reality. These children do not relate between their behavior and its consequences. A trial-and-error behavior blocks their learning rather than facilitates it. The importance of feedback in DA derives from the examiner's ability to focus the child on the relation between behavior and consequence. The feedback is given not only on wrong answers but also on correct or partially correct answers, in order to teach self-correction. The goal of the feedback is beyond teaching the child a specific response. The aim is to teach insight, lawfulness, and meaning in relation to both cognitive and emotional—motivational aspects.

7. Development of basic communication skills and adequate response style. The mediation here is aimed at changing the child's response style so that problem solution will find a proper and efficient external expression. The examiner teaches the child how to communicate efficiently by the use of clear and accepted terms and avoiding egocentric communication. The examiner also teaches the child how to communicate precisely, how to justify the answer using logical arguments, and use verbal "codes" of expression and abstract high-order concepts rather than body gestures and facial expressions. It should be emphasized that previous communication style is not taken away before establishing new response styles.

Criticism on Dynamic Assessment

Dynamic assessment was criticized sometimes as a subjective approach. In the following I summarize the main points of criticism.

DA takes more time to administer than static testing.

DA requires more skill, better training, more experience, and greater effort than static testing. The professional skill necessary to do DA effectively is not currently taught in typical graduate psychology programs, so practitioners must be trained in intensive workshops long after they have been indoctrinated in the "laws" of static, normative testing (Haywood & Tzuriel, 2002). Even with excellent training, DA examiners must exercise considerable subjective judgment in determining (a) what cognitive functions are deficient and require mediation, (b) what kinds of mediation to dispense, (c) when further mediation is not needed, and (d) how to interpret the difference between pre-mediation and post-mediation performance. Thus, inter-examiner agreement is essential. This aspect has been studied to some extent (e.g., Tzuriel & Samuels, 2000), but not yet sufficiently.

The extent to which *cognitive modifiability* is generalized across domains (i.e., analogical, numerical) needs further investigation.

Establishing Reliability and Validation of DA is much more complex than validation of static testing because it has a broader scope of goals. The question of reliability is a pressing one, especially so given that one sets out deliberately to change the very characteristics that are being assessed. At least a partial solution is to insist on very high reliability of the tasks used in DA when they are given in a static mode, i.e., without interpolated mediation. Another persistent problem is how to establish the validity of DA. Ideally, one would use both static testing and DA with one group of children and static, normative ability tests with another group. The essential requirement would be that a subgroup of the DA children would have to be given educational experiences that reflected the within-test mediation that helped them to achieve higher performance in DA. The expectation would be that static tests would predict quite well the school achievement of both the static testing group and that subsample of the DA group that did not get cognitive educational followup. Static tests should predict less well the

achievement of the DA-cognitive education group; in fact, the negative predictions made for that group should be defeated to a significant degree (Haywood & Tzuriel, 2002).

The literature is replete with evidence showing a strong relation between IQ and school achievement (r =.71). The question therefore is why applying a DA approach if so much of the variance in school learning is explained by standardized testing?

The last point means that nearly 50% of the variance in learning outcomes for students can be explained by differences in psychometric IQ. My answer to the last point is by asking three extremely important questions:

(1) What causes the other 50% of achievement variance?
(2) When IQ predicts low achievement, what is necessary to defeat that prediction?
(3) What factors influencing the unexplained variance can help to defeat the prediction in the explained variance?

Why DA is not Applied on a Larger Scale?

One might well ask why, if DA is so rich and rewarding, it is not more widely applied? Here are some possible answers:

One apparent reason is that it is not taught in graduate school-yet.

School psychologists often have "client quotas" to fill, and DA is far more time-consuming that is static testing, so their supervisors do not permit it.

The schools personnel who ultimately receive the psychologists' reports typically do not expect DA and do not yet know how to interpret the data or the recommendations, and psychologists have not been good enough about helping them on that score.

There is a certain inertia inherent in our satisfaction with being able to do what we already know how to do, and to do it exceptionally well. Even so, as we have observed before, "what is not worth doing is not worth doing well!"

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THE CURRENT STATE AND DEVELOPMENT OF THE LEARNING PROPENSITY ASSESSMENT DEVICE (LPAD)

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The Learning Propensity Assessment Device (LPAD) has been in existence for more than fifty years, and remains in active clinical use and under continuous modification and development. Indeed, its appearance, and the conceptual and clinical writings of its creater, Professor Reuven Feuerstein (Feuerstein, 1979; Feuerstein, Feuerstein, Falik, and Rand, 2002), have stimulated a whole new field of thinking and activity in the area of the assessment of cognitive and intellectual functioning--*dynamic assessment*. Readily recognized by the central scholars in cognitive development and psychological evaluation (Hunt, 1981; Cronbach, 1990; Anastasi, 1996) as a welcome and needed alternative approach to the assessment of learning potential, dynamic assessment has been adopted and developed by a wide range of scholars and practitioners throughout the world (add references here). The bibliography on the approaches to mediated learning and Feuerstein's concepts of structural cognitive modifiablity from the Feuerstein perspective alone now extent to well over 70 books, and 3000 total entries.

The LPAD currently exists in two levels: the original LPAD, now called the *LPAD-Standard*, which is applied to the individual with a mental and functional age of approximately seven years and above, into adulthood; and the *LPAD-Basic*, designed to assess the younger child (from approximately three years of age to age 6) and the older individual who is functioning at a severely low performance level. The LPAD-Basic is frequently used to establish foundational skills which then allows administration of the instruments of the LPAD-Standard. This paper is addressed to the LPAD-Standard.

The LPAD reflects a radically different view of human beings and their development, and is sharply differented from conventional psy-

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chometric conceptualizations and practices. It holds that the essential human characteristics of intelligence and cognitive development are not fixed, immutable states of being--and therefore are not appropriately the subject of study by static methods of measurement. The underlying theory, the structure of the instruments of evaluation, and the procedures for administration, data gathering, formulating conclusions and recommendations, and implementing activities on the basis of the evaluation are based on a different paradigm of human development--that of the potential for modifiability. The LPAD shifts its focus from what the individual is able to do at a given moment in time to that of what the individual *can become able to do*, both in the immediate frame of time (at the time of the assessment) and in subsequent, future interactions.

This point of view is not without its critics. Scholars and practitioners wrestle with the essential characteristics of necessary approaches to the assessment of intelligence and cognitive functioning. In *The Dynamic Assessment of Cognitive Modifiability* (Feuerstein, Feuerstein, Falik, and Rand, 2002) many of the critical issues in the development and application of dynamic assessment are addressed. We believe that a consideration of dynamic assessment in general, and the LPAD in particular comparison to conventional psychometric assessment and the adaptations of dynamic assessment (cf. Campione and Brown, 1986a, 1986b; Carlson and Wiedl, 1978, 1979; Bransford, et al., 1987; Budoff, 1974; Guthke, 1992; Guthke and Stein, 1996) requires a careful examination of the following parameters:

1. Basic assumptions regarding the nature of intelligence
2. The types of changes which can or should be produced in the cognitive structure of the individual
3. The means to produce such changes that are indicated
4. The criteria to evaluate the produced samples of change
5. The nature of interventions which are made available within the procedure
6. The structure of tasks used for the assessment of modifiability
7. The role of the examiner as mediator
8. The relation of tasks to academic content (Feuerstein, et al., 2002, p. 99)

Athough it is beyond the scope of this paper to address these pa-

rameters specifically, it is important to note that the instruments of the LPAD, and the procedures for administering a dynamic assessment using the LPAD are developed in full accordance with these parameters, as we view them as the necessary qualities to produce the outcomes we deem critical for a dynamic and meaningful assessment of cognitive functioning and the potential for modifiability. The reader who wishes more details on the parameters is referred to our 2002 book, and a more extensive literature which is referenced in it.

The LPAD Paradigm

The LPAD paradigm is based on the theory of Structural Cognitive Modifiability (SCM) and on Mediated Learning Experience (MLE). In addition, instruments and procedures of the LPAD incorporate two conceptual frameworks which guide the observation and decision-making of the assessment: the *deficient cognitive functions* and the *cognitive map*. These constructs are the basis for the construction of the instruments and form the procedures of the assessment. Thus, the LPAD examiner must have a high degree of familiarity with them to conduct the assessment. A brief introduction to the theoretical and conceptual basis for the LPAD is offered here.

Structural Cognitive Modifiability (SCM)

Human beings have a unique propensity to change or be modified in the structure of their cognitive functioning. Intelligence is defined as a state of modifiability, in response to the changing demands of life situations (Feuerstein, et al., 2002). Changes occur in response to external stimuli and internal conditions, as a direct consequence of active involvement in the process of learning. Cognitive modifiability results from a transformation in the three partners in the process: the stimuli, the mediator (examiner), and the mediatee (the examinee). We have described the nature of this change as follows:

Change is structural when (1) change in a part affects the whole to which the changed part belongs, (2) when the very process itself of change is transformed in its rhythm, amplitude and direction, and (3) when the produced change is self-perpetuating, reflecting an autonomous, self-regulatory nature. SCM is assumed to occur when the

changes are characterized by a certain degree of permanence, pervasiveness, and are generalizable. Human beings are viewed as open systems, accessible to change throughout their life spans, and responsive to conditions of remediation, providing that the intervention is appropriately directed (in quantity and quality) to the individual's need (Feuerstein, Falik, and Feuerstein, 1998).

Mediated Learning Experience (MLE)

MLE is the primary mechanism for the achievement of structural cognitive modifiability, and the process by which human learning and development is modified. As such it is a central aspect of the structure and procedures of the LPAD. The human being interactions with the environment through two modalities: (1) as a *direct* learning experience, immediately consequent to direct exposure to stimulation, and (2) through a *mediated* learning experience that requires the presence and activity of a human being to filter, select, interpret, elaborate that which is going to be experienced. There are many developmental, organic and environmental factors act as "distal" determinants of cognitive development (indirectly affecting the organism, and potentially interfering with the acquisition of and amenability to direct exposure learning). MLE constitutes the "proximal" determinant that produces structural cognitive development and the potential for being adaptive to and modified by experience. That is, MLE overcomes and “mediates” the effect of the distal determinants.

To apply MLE to the process of assessment, the examiner must incorporate three essential (or core) conditions into the interaction: intentionality, seeking reciprocity from the learner; transcendence; and the mediation of meaning. Further, the tasks of the assessment and the potential interaction that is created by the exposure to tasks leads to the potential to mediate a variety of “situational” conditions, which we have defined and described as the mediation of regulation and control of behavior; the mediation of feelings of competence; sharing behavior; individuation and differentiation; goal seeking, setting, achieving behavior; the mediation of challenge, novelty and complexity; the mediation of a capacity to change; a feeling of belonging; and the search for optimistic alternatives. Again, it is beyond the scope of this paper to describe these parameters in detail, but they are described in a variety

of other sources (cf. Feuerstein, 1979, 1980, 1995; Feuerstein and Feuerstein, 1991). The procedures and instruments of the LPAD are designed to enable MLE to occur to the highest degree possible. These elements of the LPAD will be addressed in a later section of this paper.

Deficient Cognitive Functions-Dimensions of the Individual

The LPAD enables the examiner to assess the level of cognitive functions of the individual, and the degree to which deficiencies can be overcome by the application of MLE. Developmentally, inadequate MLE leads to cognitive functions at the input, elaboration, or output phases of the mental act that are undeveloped, impaired, or fragile in their presence and contribution to learning and cognitive behavior. The process orientation which is part of the LPAD creates conditions that elicit the appearance of deficient cognitive functions, and determine their level, nature, and amenability to change--as an index of potential for structural cognitive modifiability. The LPAD examiner, through the use of the instruments and procedures, is attentive to the degree and type of investment to produce changes in one function rather than another, and the degree of resistance to change according to the profile of modifiability which emerges from the assessment process. The presence of deficient cognitive functions, the pattern of both deficiencies and well established and/or modifiable functions, and their saliency in the profile of the individual then allows the examiner to move to the next important level of dynamic assessment-the nature of the interventions which can be described and prescribed, according to the amount of resistance encountered, and the extent of the investment required to overcome the deficiencies.

The deficient cognitive manifest themselves in the three phases of the mental act: (1) the input phase, (2) the elaboration phase, and (3) the output phase. The input and output phases are peripheral compared to the elaboration phase which is the core of the mental act. This orientation links the deficient functions to the phases of the mental act, and helps define the specific factors impairing successful mastery of the task, suggesting types of strategies for their correction. This helps in both diagnosis and prescription. The interactions occurring between and among the phases are of vital significance in understand-

ing the extent and pervasiveness of cognitive impairment.

As with the parameters of MLE, the reader is referred to the literature describing in more detail the input, output, and elaboration phases of the mental act, and the description of the deficient cognitive functions (Feuerstein, 1979, 1980, 1995; Feuerstein, et al., 2002).

The Cognitive Map-Dimensions of the Task

The third critical dimension in the structure and procedures of the LPAD is that of the *cognitive map,* which represents an analysis of the types of tasks to be presented to the examiner to reach the goals of dynamic assessment. These components of the task interact with the cognitive functions in the formulation and production of responses, and serve as a guide to the provision of the MLE within the assessment process.

The cognitive map includes seven parameters by which a task can be analyzed:

(1) ***content:*** the subject matter with which it deals and the universe of content on which it operates: responses are considered in light of the presence or absence of relevant content dimensions embedded in the task; deficiencies represent the lack of appropriate necessary content.

(2) ***modality:*** the *language* of presentation of the task: verbal, pictorial, numerical, figural, or a combination of these and other codes; efficiency in use of specific modalities may differ among individuals because of their preferential modes or because of their differential saliency due to a variety of distal factors (e.g., neurological or sensory deficits, lack of exposure to specific teaching,

etc.); difficulty involved in using a particular modality must be understood in order to be described, bypassed or challenged.

(3) ***phase:*** the three phases of the mental act--input, elaboration, and output--may be differentially represented in a given task; for assessment of deficiency it is necessary to identify the contribution of each specific phase to isolate and understand its role in interfering with performance; analysis of impaired performance in terms of phase helps to locate deficient cognitive functions and the source of difficulties.

(4) ***operation:*** an operation represents the mental which enables in-

formation derived from internal and external sources to be organized, transformed, manipulated, and acted upon in a way as to generate new information (e.g., classification, seriation, logical multiplication or analogical, syllogistic, or inferential thinking); assessment requires an analysis of the nature of the required operation and the component elements in the task necessary for the acquisition and/or application of the required elements; the examiner observes and mediates according to the presence or level of impairment in the related cognitive functions required to achieve the operation.

(5) ***level of complexity***: the quantity and quality of units of information required to be handled for its solution--the more familiar and organized are the units, even if they are multiple, the less complex the act, the less familiar or organized, the more complex the mental act; the task is analyzed from three perspectives: (1) the number of units of information contained in the task, and (2) the degree of familiarity the subject has with the task and its component elements, and (3) the degree of organization, grouping, and categories which may allow a reduction in the complexity of the task.

(6) ***level of abstraction:*** defined as the distance in the task between a given mental act and the object or event upon which it operates; a mental act may involve operations on the objects themselves (as in sorting), or it may involve relationships between hypothetical propositions without direct reference to real or imagined objects and events.

(7) ***level of efficiency:*** qualitatively and quantitatively different than the other six, although it is determined or affected by them, singly or in combination; defined as relating to the structure of the task which requires a certain degree of rapidity and precision in order to be solved; a third dimension is the level of effort experienced by the subject as needed to generate or sustain a given performance; the relationship of level of efficiency to the other parameters is observed--for example, where a high level of complexity, attributable to a lack of familiarity, may lead to inefficient handling of a task; this dimension is highly related to "affective-energetic" factors in performance, and needs to be carefully considered in the assessment process.

The cognitive map as an analysis of the dimensions of the tasks to which the individual is required to respond is thus an important element in the process of dynamic assessment and the use of the LPAD. It influences the examiner's choice of the types and order of instru-

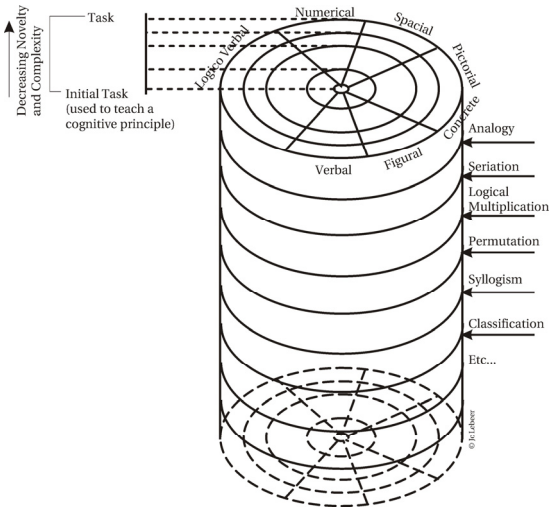
ments to use in the assessment, the amount of time and extent of focus within an instrument, and the nature and type of mediation to offer in the interaction with the instrument(s). Moreover, it provides an important perspective toward reaching a meaningful assessment of modifiability and search for the most efficient and economical ways to overcome the barriers presented by deficient or restricted performance.

The Structure of the LPAD

The LPAD represents a shift from a static to a dynamic goal of assessment, notably from the search for stable characteristics to that of determining the potential for modifiability of the individual. This requires changes in four dimensions of the testing conditions:

(1) The Structure of the Instruments:

The LPAD instruments are designed to overcome the limitations inherent in the conventional psychometric approach, and enable the assessment of fluid rather than crystallized intelligence. These instruments present a sharp departure from the goals usually set for assessment. Figure 1 illustrates the Learning Propensity Assessment Device (LPAD) model by which the instruments are constructed, reflective of the goals described above. The very small circle at the top center of the cylinder represents a problem, task, or situation first presented to the examinee for solution and mastery.



As the subject responds to the problem, the examiner observes initial levels of performance, mediates areas of deficient or hesitant functioning, and explores the examinee's utilization of appropriate principles and/or strategies representing the application of relevant cognitive operations. The examinee is then presented with additional tasks that represent more complex levels of the initial training task, represented in the model as moving outward from the center, as the diverging, concentric circles indicate. Subsequent tasks vary the novelty, difficulty, and complexity, and allow for further observation and mediation, as samples of change are elicited. The progressive novelty, difficulty, and complexity are produced by changes in one or more dimensions inherent to the solution of the task--the objects, the situation, the relationship between objects, their specific functions with regard to one another, or the cognitive operations that are required to solve the problem. The radial lines that divide the top of the cylinder into sections indicate that the tasks selected can be presented in different modalities--in the LPAD instruments reflected as spatial, pictorial concrete, figural, verbal, logico-verbal, or numerical. The examinee is thus presented with variations in modality of presentation, both within an instrument and from instrument to instrument in the battery selected. Issues of modality, levels of complexity of the task, level of abstraction, and the content of the tasks represent a reflection of choices that the examiner makes, in selecting the instruments to include in the LPAD battery and in directing medition to the performance within the instruments (implementing the dimensions of the cognitive map).

For example, one may keep the operation constant while changing objects and relationships, or keep the objects and relationships constant while only varying the operations. Novelty can then be observed by considering the number and nature of dimensions introduced in the problem, as compared with those of the initial task that was used for training purposes. The specific operations required by the problem represented by the center small circle and by the diverging tasks introduced following initial training can be presented to the examinee in a variety of modalities or "languages."

A third dimension of the model represents a selection of mental operations relevant to the task, such as analogies, logical multiplication, permutations, syllogisms, categorization, seriation, etc. reflected in the vertical layers of the cylinder.

By using instruments constructed according to this model, one may gather data relating to the following critical dynamic assessment criteria:

1. The modifiability of the individual when confronted with conditions specifically designed to produce change(s).

2. The extent of the examinee's modifiability in terms of levels of function made accessible, and the significance of the levels attained in the hierarchy of cognitive operations (from perceptual to higher order operations).

3. The amount of investment (teaching, therapy, duration of treatment, etc.) necessary to bring about and sustain a given amount or type of modification.

4. The significance of the modification in a given area for other general areas of functioning. In other words, to what extent the patterns of functioning acquired in the assessment-training process can be applied in other areas than that of the specific training experienced.

5. Identification of preferential modalities in the individual, which represent areas of relative strengths and weaknesses, both in terms of existent inventory of responses and in terms of preferred strategies for achieving the desired modification in the most efficient and economical way. (Feuerstein, Feuerstein, Falik, and Rand, 2002, p.161-162)

Static measures completely neglect separate assessment of the dimension of modifiability because they equate the measure of manifest functioning with the true, fixed and immutable "capacity" of the individual. The dynamic approach does not deny the fact that the functioning of the individual, as observed in the level of achievement or general behavior, is low; but by considering this level as pertaining only to the manifest repertoire of the individual, it takes into consideration the possibility of modifying this repertoire by appropriate strategies of intervention.

The tasks in the LPAD instruments are shaped in such a way as to create the conditions to observe the appearance of the deficient cognitive functions viewed as responsible for the failure of the individual to master the task. The tasks and sequence of tasks in each instrument are designed to tease out the types of deficiencies and through the analyses of the process observe what is causing success or failure. The tasks are therefore selected and constructed according to the dimensions of deficient cognitive functions and the cognitive map. In the

RSDT instrument for example (see below), we try to figure out the type of perception of the individual, the capacity to analyze, to create cardinal order, to represent what is perceived abstractly.

An important strategic objective in the structure of the LPAD instruments is the provision of a "lens" through which to search for indicators of even the most minimal changes in the functioning of the individual, to be used as representative samples of modifiability. One such example is the observation of increased speed of formulating responses, or expressions of certainty or energy in responding, which suggests the establishment of changes at a structural level, and gives the examiner cues for further or differentiated intervention. With such observation, and mediated intervention, the instruments (and the accompanying process) enables the answering of these very important process questions:

What are the observed obstacles to effective performance?
How amenable to change are the observed deficiencies?
How much change can be expected?
What is the *nature* of the investment required to produce the desired changes? (content areas, modalities of response, mental operations, etc.)
How *much* investment is required to produce the desired changes?
How much stability can one attribute to the desired change?
How much generalization can one achieve following MLE intervention?

(2) The Nature of the Testing Situation and Procedures:

In the LPAD, the testing situation is changed parallel to changes in the instrumentation in order to reach the dynamic goals set by the LPAD. The purpose of assessment is evaluate the individual's ability to learn and to yield information regarding the manner and modality through which learning is best achieved. This requires an alteration of the typical (psychometric) examiner/examinee relationship, transformed into a highly flexible and individualized approach in which the role of the examiner is to produce change-to prod and explore for signs of modifiability and also to attend to the functions that appear to impede the progress of the individual. This takes two specific forms: (1) changes in the examiner-examinee interaction, and (2) the introduc-

tion of training (mediation/teaching) as an integral part of the assessment process. Each will be briefly described here, but have been elaborated considerably elsewhere (Feuerstein, Falik, and Feuerstein, 1998; Feuerstein, Feuerstein, Falik, and Rand, 2002).

Examiner-Examinee Relationship: The LPAD shifts the roles of the examiner-examinee into that of a relationship between teacher (the mediator) and pupil (the mediatee). The neutral, indifferent role of the examiner as required in a psychometric model is changed into an active cooperative role of the mediator, who is vitally concerned with the maximization of the success of the pupil. The examiner constantly intervenes--questions, orients, makes remarks, interprets results, and gives explanations whenever and wherever they are necessary, asks for repetition, sums up experiences, anticipates difficulties, warns the examinee about them, and creates reflective insightful thinking in the individual not only concerning the task but also regarding the examinee's reactions to it. The examiner is vibrant, active and concerned, giving the examinee the feeling that the task is important, difficult, yet quite manageable, and that examiner is committed to the examinee's success. The interaction between examiner and examinee has as its basic outcome an increase in the test-taking motivation of the examinee by the fact that the examiner (acting as a teacher-trainer) conveys to the examinee (responding as the pupil-trainee) the meaning of the task, the importance of mastering it, the capacity to do so, and finally, by a process of feedback, an ability to select the appropriate behavior leading to success.

The Training Process Integral to the Test Situation: The examiner-examinee interaction aims at inducing the cognitive prerequisites for the examinee's successful confrontation with the testing task. This training is not merely oriented toward a specific content but includes the establishment of the prerequisites of cognitive functioning for a wide array of behavioral patterns and the repertoire necessary for problem-solving behavior. The six areas on which mediation focuses are:

1. Regulation of behavior through inhibition and control of impulsivity, as well as the initiation of appropriate responsive behaviors.
2. Correction of deficient cognitive functions and activation of available but fragile functions.

3. Enrichment of the repertoire of mental operations.
4. Enrichment of the task-related content repertoire (e.g., labeling of relationships such as "up, "down, "equal to," etc.).
5. Creation of reflective, insightful thought processes.
6. Shifting from a reproductive to a productive, creative information generating activity (Feuerstein, Falik, and Feuerstein, 1998, p. 136)

(3) A Shift in the Goals of Assessment from Product to Process-Profiles of Modifiability:

Dynamic assessment requires a shift from a product-oriented to a process-oriented approach, the major effort of which is directed to the understanding of the processes involved in their evolvement. This shift demands both theoretical/philosophical changes and new conceptual and methodological structures. An important aspect of the shift is the creation of modalities of observation and registration of *indices* of the processes responsible for the outcome of the assessment. The ultimate purpose of dynamic assessment, from the perspective of the LPAD, is to create samples of change by which one may identify the *propensity* for cognitive change, and to describe that change in such a way that subsequent learning and cognitive interventions will be identified and recommended. Toward this end the dimensions of the cognitive map and the deficient cognitive functions, factored into the mediational interventions that are necessary and provided to produce the change, are used in an integrated way to establish a "profile of modifiability." The profile refers to the process which has been set in place by the mediational interaction, a process which will result in a continuous set of changes based on the modifiability demonstrated and observed. The "profile" is therefore a process and not a product. The structure of the profile reflects the special nature of the LPAD as a dynamic assessment procedure precisely because it does not present a fixed and prescribed patterns of scores, and other similarly rigidly prescribed statistical and comparative portrayals. The LPAD directs the summary and analysis chracterized in the profile to comparisons "within" the individual rather than to comparisons "among" individuals. Finally, the LPAD profile creates a structure which serves as a point of departure in consultation between the examiner and the relevant profes-

sionals and significant others (parents, spouses, relatives) in the life of the subject. The use of the profile goes much beyond that which we are able to convey within the scope of this paper, and the interested reader is encouraged to access the references noted above.

The Role of the LPAD Examiner: A great variety of techniques and strategies must be used by the examiner to first produce and then detect changes. The examiner employs a highly refined mediated learning experience (MLE) interaction (flexibly, innovatively, sensitively) in conjunction with the use of the LPAD instruments. In addition, the examiner must have an operational familiarity with the dimensions of the tasks (cognitive map) and the nature of the cognitive functions as they are reflected in the subject's task performance. The process of dynamic assessment aims at manipulating the various conditions under which a given state can be modified, and then registering and describing the optimal conditions by which the modified response can be elicited. To be effective in diagnosing modifiability, the LPAD examiner must be skilled in the ways in which changes in functioning are produced. The examiner must consider (1) why the change has happened, (2) how to make it happen again, or (3) how to keep changes from happening if they are undesirable. In the LPAD, the examiner's responsibility for a subject's success becomes a potent force for a radical alteration in the examiner/examinee interaction, as compared with the traditional psychometrically oriented testing situations in which an examiner only measures and registers certain (presumed) objective, stable, continuous, linear phenomena. To determine the real meaning of success and failure the LPAD examiner must carefully and precisely observe the interaction of the examinee with the instruments (the tasks), according to the parameters of the cognitive map to explaining the reasons for various responses and subject performance, and to identify the potential mediational interventions to solve an observed difficulty in the examinee. Finally, the interpretation of results, reflected in the profile, suggests ways by which to modify a the cognitive functions and deficiencies.

(4) The Interpretation of Results:

Following upon the above, the interpretation of results is also substantially different. What absolute numbers are used relate to the indi-

vidual's initial performance, at at the "baseline;" or following intervention, to indicate degrees of gain or change. However, the absolute numbers are not considered substantially informative about the nature, degree, and permanance of the changes that are produced during the assessment process. Rather, the LPAD examiner is called upon to detect and make as accurate an assessment as possible of the conditions preventing the individual from functioning at higher levels and to describe the amount, type, and nature of intervention which is needed to overcome them. The most important information generated by the specially structured interaction does not refer to what an examinee "can do" during the assessment experience, but refers to the changes produced to permit the examinee to accede to higher levels of functioning, and to maintain and elaborate them.

The data produced by the LPAD should not be considered as evidence of immutable and fixed traits (of modifiability). The indicators of modifiability obtained during the assessment constitute a “sample” of what can be expected with further investment, and therefore a type of prediction. It is very likely that the "rate" of observed change may undergo meaningful change in the direction of a higher, more rapid, or perhaps even a slow down in the rate of modifiability following intervention. It must be recognized, and reflected in the analysis of the results that the changes have a recency and fragility, and may need enhancement through the consolidation, crystallization, and habit formation which may be achieved with subsequent interventions over time. The conveying of results of an LPAD assessment is focused on ways to further enhance the individual's modifiability, and make the examinee increasingly accessible to both areas and levels of functioning which could not be directly and specifically observed and predicted from the initial assessment.

The process of dynamic assessment, incorporating these changes into a process of interaction requires a level of proficiency on the part of the examiner which is determined by knowledge of the paradigm, and the aquisition of skills through training and practice. Through a combination of specially designed instruments, a reframed and focused mediational interaction, and a carefully organized analysis and conveyance of results the goals of dynamic assessment are achieved.

The Instruments OF THE LPAD

There are currently 16 instruments in the LPAD-Standard battery, and 16 instruments in the LPAD-Basic. They can be generally grouped into three categories, according to general focus and assessment objectives:

Standard	**Basic**
Instruments Focusing on Visual-Motor and Perceptual Organization	
Organization of Dots	Counting Dots
Complex Figure Drawing	Complex Figure (Simplified)
Diffuse Attentiion Test (Lahi)	Spatial Organization
Reversal Test	Mazes
	Flat Puzzles
Instruments Focusing on Memory, with a Learning Component	
Positional Learning Test (5 X 25)	Visual Transport
Plateaux	Memory Test in Two Modalities
Associative Recall:	Associative Recall:
Functional Reduction	Functional Reduction
Part Whole	Part Whole
16 Word Memory Test	
Instruments Involving Higher Cognitive Processes and Mental Operations	
Trimodal Analogies	**Concept Formation:**
	By Inclusion
	By Elimination
LPAD Matrices:	
Raven's Colored	Test of Inferential Thinking
Raven's Standard	Part Whole
Set Variations:	Functional Part Whole
B-8 to B-12	Progressions
Set Variations I	Absurdities
Set Variations II	Picture Assembly
Representational Stencil Design	Nested Puzzles
Numerical Progressions	
Organizer	

The LPAD examiner constructs a battery of instruments according to the initial referral information, observations of functioning, and indications of performance provided by initial responses to tasks within the instruments. While instruments are usually selected from all three categories, even with low functioning examinees, seldom are all instruments administered to a given examinee. Generally, the examiner administers instruments to answer the process questions such as have been outlined above.

In this section the instruments of the LPAD-Standard will be briefly described, to give reader a flavor for the objectives, structure, and some of the outcome indices available. The content, modality, mediational objectives, and cues will be summarized. The descriptions are adapted from Feuerstein, Feuerstein, Falik, and Rand's (2002) more extensive treatment (see also *the LPAD Revised* Examiner's Manual, [Feuerstein, 1995]). Descriptions of the LPAD-Basic can be found in other sources (cf., Feuerstein, et al., 2002).

Instruments Focusing on Visual-Motor and Perceptual Organization

Organization of Dots (OD): This test is often the first instrument in the LPAD battery presented to subjects. The form and procedures of this instrument are derived from the work of Professor Andre Rey. OD consists of simple geomtric figures formed by connecting appropriate dots which are presented to the subject in an amporphous array (within a defined frame or field). The modalitity is figural, with the task performance being motor and requiring eye-hand coordiantion. Thus, if perceptual/motor difficulties are anticipated in the subject, the instrument may be presented at a later point in the assessment process. The task of the instrument is to organize the dots in each frame to replicate the model figures by projecting the required relationships and drawing lines to connect the dots. The goals of this activity are to (1) organize an unstructured field by using cognitive strategies to overcome obstructing perceptual factors and conflicts (caused by increasing degrees of rotation and overlapping of the figures), (2) learn how to establish and project relationships, and (3) learn to plan behavior as a function of the task and inhibit the propensity to act impulsively.

The format of OD is that of a test page and two training pages.

There is also a data registration and scoring sheet available for use. Each page is constructed with sample forms, and frames which the subject must complete. The frames present problems of increasing novelty and complexity, and are organized to present particular strategic "dilemmas" which the subject must resolve for successful problem solving performance.

The examiner directs the mediational interaction to structure the subject's investment in the task, on the projections of virtual relationships, the constancy of the figures, the need for precision, the regulation of behavior, and other elements. The examiner observes the subjects as they respond to the tasks, determines the deficiencies that appear, and provides whatever intervention necessary to prevent further failures and teach necessary strategies and approaches to enable successful responding.

During the training, or mediation, phase the following interventions are particular to the OD instrument: (1) the use of cues in some frames and lack of cues in others to guide systematic searching for the forms; (2) alerting the subject to overlapping and rotations as a challenge to object constancy and identity of the form; (3) dealing with changes in orientation in the frame from the presentation of the model; (4) the introduction of general strategies if they are not observed in the subject's spontaneous responding--including choosing a starting point for the search, reference to the model, defining the characteristics of the figure, counting the dots, changing the starting point, developing and testing of hypotheses, and planning ahead. Deficiencies are noted, and mediational interventions are matched to the individual needs observed. For example, in some instances the difficulties might be in the motor modality, in others it can be a matter of lack of verbal labels to describe perception, a lack of planning ability, or a restricted range of available strategies.

There is no time limit for this instrument, and the total anticipated time devoted to its adminisration depends upon the amount of mediation required and the subject's pace of acquisition of functions.

Complex Figure Drawing Test (CFD): The Complex Figure Drawing Test is adapted from Rey (1959) and Osterreith (1945). The task consists of reproducing a complex geometric figure, directly from the stimulus, and then from memory, before and after a mediational intervention. The figure is composed of internal and external elements, and

is structured so as to be able to observe the subject's "organizational efficiency" in the copying and recall of the design. That is, to what extent does the subject perceive and use the structural elements of the design to organize and sequence responses, and what effect do these tendencies have on accuracy and efficiency of response.

The design is presented to the subject who is asked to copy it, taking as much time as needed. After a latency period of a few minutes, the subject is asked to draw the same design from memory, with the same procedures used for noting the sequence of the drawing. Following the memory phase, a mediational phase is provided, based on observations of performance (impairments or blocking of cognitive functions, improving organizational or sequential aspects, etc.). After mediation, the subject is asked to copy the drawing again from the stimulus (a second copy phase) and from memory (a second memory phase). There is an other phase available to the examiner following the phases just described-a Representational Organization of Complex Figures. In this phase the subject is shown a template with 10 designs, constructed in such a way that a central geometric figure is embedded in a set of adjacent or juxtaposed figures. The subject is asked to point out (rather than draw) the organizing figures, and hypothesize in what sequence the figure would be reproduced. This phase is particularly helpful for those individuals who experience an episodic grasp of reality to search for an organizing principle which enables the perception of details related to and continent upon a main figure.

The modality of the CFD is figural and graphic, with motor control being emphasized. The goals of the instrument are to: (1) assess the capacity of the subject to organize and structure a complex field, (2) assess organizational and visual memory, (3) assess the modifiability of the subject from the quality, organization, accuracy, and completeness of the production after mediation, and (4) evaluate the process used by the subject in strucuring and organizing a complex field.

The mediation process is directed toward improving deficient cognitive functions, but also to the production of insight as to the meaning of organization and the way it affects the quality of reproduction and memory. The amount and type of investment in mediation is an important variable to take into account in assessing the subject's modifiability. Modifiability in the context of this instrument is seen in the passage from one type of organization to a more efficient one.

Diffuse Attention Test (Lahi): This instrument was developed by Lahi from the work of Zazzo (1964), and is used in the LPAD procedure to assess the subject's rapidity and precision on a task that requires visual scanning and maintaining attention and focus on a visual /motor and repetitive process. The subject is presented with eight simple and repetitive figures (a small square with a protruding line coming from one of the four sides or corners). Three of the eight figures are designated as model figures, and are isolated at the top of each section of the test page, and are identified and "taught" as the ones to differentiate. The subject must then scan lines of 40 figures, comprising the eight figures presented in a random order, and mark the three model figures when they are perceived and identified. Because the test sheet is perceptually quite dense, the subject must scan carefully and work to maintain visual tracking and cognitive attention. Performance is observed in one minute intervals, yielding scores of the proportion of correct and incorrect inclusions, and omissions, within the segments.

The content of the Lahi is simple geometric forms. The modality is graphic and visual-motor. The motor act is simple, requiring only a rapidly drawn mark when the appropriate figure is identified. The goals of the instrument are to (1) assess levels of efficiency in learning a simple task, (2) assess levels of rapidity and precision with repeated exposures and practice, (3) assess crystallization of learning with practice, and (4) observe independence from stimuli with automatization of learning.

The Lahi is especially useful in situations of attention deficit behavior. The instrument allows observations of ability sustain attention over time, and with repetitive tasks. The subject must "learn" the relatively simple perceptual differentiation of where the line is coming from the square, and then remember it as similar stimuli are being scanned. A constant state of alertness is required due to the random appearance of the "correct" stimuli. The examiner observes performance over a period of ten minutes, and assesses the maintanence or changes in performance during that time.

Reversal Test*:* This instrument requires the subject to look at two figural designs contained in a frame, and indicate whether they are the same or different. If different, the subject is asked to make a rapid mark, and move on to the next differentiation. There is no focused

mediation on this instrument, other than establishing a clear response expectation in the subject, which is done with several practice problems before the test is given. The subject responds rapidly, using visual tracking, without mediational intervention. The differentiation's are based on reversals, part-whole relationships, and structural changes.

The content is simple geometric designs, with regular and irregular geometric properties. For those that are "different," different variations (structural, positional, orientational) are presented. The modality is thus figural with minimal motor performance required. While this instrument does not involve mediational intervention, it gives excellent cues regarding the development of lexic functions in the subject, and orients to mediational options in other instruments (as on Raven and Set Variations), and in content areas of reading and mathematics (as regards the decoding aspects of numerical symbols.

Instruments focusing on Memory, With a Learning Component

Positional Learning Test (5 x 25) (PLT): This test is also adapted from Rey. The subject is shown a grid of 25 squares, organized in five rows and five columns. The subject is then shown five positions, corresponding to one for each row and column, designated by the examiner pointing and saying "here, and here, and here, etc." After a short (ten second) latency period, the subject is asked to reproduce the indicated positions by marking them on the same grid, using a sheet with a number of "blank" grids provided. The procedure is repeated, with minimal mediation, until the subject can reproduce the pattern correctly approximately three times in succession. After several incorrect trials (if they occur), mediation is directed toward the apparent source of the errors, and to establishing strategies that the subject can use. After learning one pattern, the procedure is repeated similarly with different patterns, enabling the examiner to observe the learning of new patterns in the presence of previously learned and potentially confounding patterns.

There are five different patterns available, each of which presents different sequences of positions. Each positional array is presented to the subject through sufficient trials to attain mastery (accuracy of recall of the positions) before moving to the next sequence of positions.

The content of the PLT is spatial orientation, with a relational component. The modality is visual-motor and graphic, but without the element of eye-hand coordination, as the subject is required only to make a simple mark in the selected seqment of the grid. The goals of the instrument are to (1) evaluate the efficiency of a positional learning experience, (2) observe the process of establishing a learning curve for this function, (3) assess the subject's capacity to discover and use principles of organization, (4) evaluate the effects of learning experience in increasing efficiency in discovering new positional organizations based on the initial principle, and (5) assess the subject's capacity to overcome difficulties of interference from prior learning sets.

Mediation is offered after observation of failures on several successive trials. It begins with focusing the subject's attention on the basic elements of the task and the structure of the materials needed to function (e.g., the grid and the positions by row and column). The examiner mediates for insight, asking questions that orient the subject to thinking about process (for example, "Did you make a mistake because you did not look, or because you didn't check the number of squares before you made your mark?"). Other mediational interventions are directed toward acquiring strategies and using the components of them to retrieve or fix elements in memory. Mediation can be focused on controlling for impulsivity, checking hypotheses, and active reconstruction of images and schema developed through repeated exposure to the stimuli.

Rapidity and precision of learning are major criteria for the interpretation of results. The subject's performance with spatial and organizational memory, in the absense of concrete cues (such as pictures or designs) and the need for motor constructions (as in drawing or other motor performance) can be assessed.

Plateaux Test: This instrument is another of those adapted from the work of Professor Rey. The subject is presented with a set of four plates, superimposed upon one another in the subject's view. Each plate contains nine buttons or pegs, arranged in three parallel columns or rows (a 3 X 3 design). Each plate has one peg that is fixed and immovable, but in a different position relative to the pegs on the other three plates. The subject is first asked to search for and identify the location of each of the fixed pegs, and remember them from the first to the fourth plate in succession. The strategies used and the number of

trials needed to acquire this learning is noted. Once this is learned, the subject is asked to portray this "two-dimensionally" by making a schematic representation of the positions on paper. Another phase of the instrument is invoked when the subject is asked to anticipate the outcome of a change in the position of the fixed pegs when the place is rotated first 90 degrees, then 180, 270, and 360 degrees in succession. A learning goal of this phase, although it is present in the earlier ones as well, is to encourage process insight by asking the subject to anticipate, predict, and ultimately develop a rule or generalization which can be used in prediction of outcomes. A more advanced version of the instrument can be constructed by fixing two pegs on each plate.

The content of the Plateaux Test is more complex, involving topological, relational, and positional learning under conditions of reduced visual cues. The modality is similarly more complex, involving visual, kinetic, and tactile cues as well as internalized mental imagry.

The interpretation of results on the Plateau Test takes into account both quantative information (rapidity of acquisition, capacity to encode information from one modality to another, ability to acquire and maintain representational information) and quantitative data. At the latter level, this is reflected in the way the subject perceives reality and organizes it, the use of impulsive or reasoned and logical approaches to encountering and responding to reality, the search for perceptual cues versus the use of relational criteria, the ability to hold and use multiple sources of information, and the like.

Associative Recall: Functional Reduction and Part-Whole (AR:FD and AR:PW): This test, which is also adapted from Professor Rey's early work, consists of two formats, similar in organization and objective. The subject is shown a page which contains a row of twenty simple line drawings along the top row, selected for their familiarity to the subject and the unambiguity of their figural presentations. In the first row the objects are drawn in their entirety, and the subject is asked to name them (a labeling phase). In the second row, on the ***Functional Reduction (FW)*** page drawings of functional substitutes are shown. On the ***Part-Whole (PW)*** page a salient feature of the object is presented. In the third row there is a further stimulus reduction and in the fourth and fifth rows are changes in order of presentation both with the first and second conditions of visual stimulus reduction. The subject is asked to recall the original labeled object on the top row

from a visual inspection of the reduced stimuli under the various conditions presented in the subsequent rows that are exposed, with the preceding rows concealed. Mediation is offered at the end of each phase to focus attention to maintain the subject's vigilance and awareness of the task.

The content of this instrument is pictorial, with secondary reinforcement by verbal labels. The modalities are visual, auditory, and graphic. The goals of the instrument are to (1) assess the subject's visual and associative memory, particularly under conditons of reduced visual cues, (2) assess the capcity to retrieve an object stored visually and verbally by its functional substitute (FR) or its salient detail (PW), (3) study the relationship between free recall and recall supported by the functional substitutes for objects and/or reduced cues and order, and (4) assess the capacity to resist the pressure of a preceived functional substitute to elicit its label instead of the label of its associated object. Throughout, variables of changes in order and the amount of visual cueing are considered in relation to the memory functions.

This test explores the cognitive support involved in the consolidation of the memory function. Mediation therefore initially seeks to address the attitudinal and motivational conditions for mobilizing attention and perceptual processes. The format (particularly for the Functional Reduction) requires an inhibition of impulsivity that is suggested by the stimuli, leading to supressing the tendency to label the reduced stimulus rather than the original object from which it is derived. Another tendency is that of blocking, wherein the subject cannot remember more than just a few of the original objects. Mediation is also directed toward encouraging retrieval in memory.

16 Word Memory Test (WM): This instrument presents the subject with a list of 16 well known and frequently encountered words, presented orally and in a conceptually random order. The subject is asked to repeat as many as can be recalled following the presentation of the list and a latency period of approximately ten seconds. The subject is told that the process will be repeated several times, and the list is read aloud again in the same order. No mediation is offered for the first three or four repetitions. The examiner observes the subject's spontaneous recognition and inclusion in memory of the four categories (clothing, school supplies, animals, and vegetables) into which the 16 words can be grouped. After four repetitions, mediation is offered to

encourage the memory process, using a variety of cues, both mnemonic and cognitive, until the subject can recall all or a majority of the list using internalized memory functions and achieve accuracy and efficiency of response.

The content of WM is familiar and common words. The modality is verbal and auditory. The goals of the instrument are: (1) to establish an initial baseline of rote memory at the levels of initial and repeated exposures, (2) to assess capacity to discover and/or learn principles of organization, (3) to observe the subject's power of concentration and ability to sustain focus on the task, and (4) to evaluate the subject's capacity to utilize feedback that occurs through the process of mediation.

Instruments Involving Higher Cognitive Processes and Mental Operations

Tri-Modal Analogies: This instrument is used with younger children and low functioning individuals to establish analogical thinking, using figural, pictorial, symbolic, and verbal modalities. The stimuli require the subject to mentally manipulate and elaborate, thus moving the learner into abstract mental operations without needing to rely on concrete manipulatives. As such, they are useful as a preliminary to working on the more abstract and complex Raven's and Set Variations tasks. The instrument is administered in a format similar to the Set Variations (see below). The subject is shown two stimuli, asked to consider the relationship between them, and then look at a third stimulus. The subject is then asked to select from a number of alternatives a fourth choice which is consistent with the relationship existing in the first two. Once the learner has established proficiency on the format and concepts of the “mediational” task, a series of variations using the same modality is presented.

The learner is required to use concepts of size, shape, number, and positional orientation to establish relationships and complete the analogy. The mediational opportunities in this instrument enable the teaching of orienting and superordinate concepts, and the analysis of errors to indicate areas of deficiency or fragility in concept formation or acquisition. The general progression of tasks is at a lower level (as regards necessary mental operations), but assesses similar processes

as in the Raven's and Set Variations instruments described below.

LPAD Matrices: There are five instruments in the LPAD battery that use the matrice format, including ***Raven's Colored Progressive Matrices (CPM) and Standard Progressive Matrices (SPM)*** (1963, 1979)**,** and three instruments adapted from the Raven format: ***Set Variations B-8 to B-12, Set Variations I,*** and ***Set Variations II.*** The Set Variations B-8 to B-12 instrument is based on Ravens CPM items B8 to B12. Set Variations I is based on SPM levels A, Ab, and B. Set Variations II is based on principles similar to SPM levels C, D, and E, but the items present greater novelty in the modality of presentation. The Ravens instruments are administered according to LPAD procedures, using a "test-teach-retest" approach with mediation to identify general rules and principles used by the subject in the solution of the problems, and to ameliorate any sources of difficulty. The Set Variations instruments are constructed and administered on principles similar to those of Ravens, with a sample problem for each set of variations which receives intensive mediation, and then the observation and recording of independent performance on a series of problems similar to--but also becoming progressively more difficult than--the mediational example. The tasks require the learner to look at a series of designs, and complete the series by selecting a correct alternative from a number of choices. To choose the correct alternative the subject must understand the relationship among the variables. The tasks become progressively different and more difficult, by adding to the number of variables and changing the dimensions used to establish the relationships. What is assessed on these tasks is the subject's ability to think using analogies presented as figural (visual/perceptual) information, and their response to the teaching of strategies to solve the problem.

The tasks require perceptual closure and discrimination using patterned figure completion and the process of analogical relationships. To solve the problems the subject must generate new information through the operations of synthesis, permutations and seriation, inferential thinking, analogical thinking, deductive reasoning, and relational thinking. The goals incorporated in the instruments are to assess (1) the capacity of the subject to grasp the pinciple underlying a problem and apply that principle in solving it, (2) the extent to which the newly acquired principle is successfully applied to solving other problems, (3) the differential effects of various training and functional

strategies, and (4) the amount and nature of investment required to teach a given principle and sustain systematic and integrated performance.

On the Raven's CPM and SPM, initial performance is observed, and can be recorded for the purposes of establishing baselines of functioning. From a dynamic assessment perspective, however, it is important to discern and establish the use of principles of organization and the constituent concepts being employed in successful performance as well as to teach absent or deficient functions. On the Set Variations instruments, mediation precedes the subject's performance on the sample task of each set within each instrument. As with all other LPAD instruments, the examiner must decide to what extent mediation should be initiated, what should be mediated, and what degree of continuation and elaboration is necessary. The sample problems the precede each level should be used to "over-mediate"--that is, to cover all of the possible mediational options as an intensive learning experience, and as a basis for observing subsequent responding on the variations problems. This can also be viewed as preparatory mediation, constituting problem definition, focusing, regulation of behavior, rule teaching, and sequencing. Following the subject's response, the mediational objectives are to correct errors, identify missing elements in information processing, teach strategies for problem solution, and--as a main overall goal of mediation-the development of insight into the cognitive processes underlying the subject's performance.

Mediational interventions on these instruments are quite complex, in their potential range of responses and relationship to the cognitive processes described above. The *Revised Examiner's Manual* for the LPAD (Feuerstein, 1995) offers numerous specific and focused mediational responses to guide the examiner. A few examples of the extensive range of mediational interventions directed toward responses on these instruments are: focusing (the subject is made to invest more time in data gathering), selection of stimuli (specific items are isolated for clear and accurate perception), imitation (showing the subject how to solve the task by modelling), repetition (asking the subject to repeat a response), verbal stimulation (establishing verbal labels, descriptions, rules, etc.), inhibition and control (regulating behavior by imposing delays, covering up alternative responses, etc.), identification and description (asking for descriptions of shapes, content, orienta-

tion, etc.), cause and effect relationships (explaining transformations in stimulus information).

The matrice instruments are amenable to scoring (for correct and incorrect responses), and can be profiled according to pre- and post-mediational performance. As such, they have often been used as baseline and post-mediation measures when the LPAD is used in a research-oriented format.

These instruments are particularly useful in assessing higher mental functioning, and can be accessable to individuals who are initially viewed as low performing. With mediation, and given the format of the instruments, the examiner is able to explicitly and systematically introduce a variety of prerequisites of thinking. Successful mastery of the tasks, observed first at the molecular level of performance, depends upon elaborational functions and higher-order intellectual acts (e.g., comparative and inferential thinking).

Representational Stencil Design Test (RSDT): The RSDT is based on Stencil Design Test of Grace Arthur (1930) but differs significantly in its structure and technique of application, primarily in the shift of the task away from the concrete, manipulative modality toward a representational, internalized modality by which the design to be constructed occurs on a purely mental level. The task consists of 20 designs which the subject must reconstruct representationally by referring to a page of "model" solid and "cut-out" stencils which must be mentally superimposed upon one another. The problems increase in level of difficulty (on dimensions of form, color, and structure) and are organized so that mastering simpler problems leads to abilities to successfully solve harder ones. The procedure of this test first orients the subject to the stencil page, then offers options of a Test page of problems, a Training page to mediate various processes and strategies according to what is observed during the test page, and Parallel Test pages to be used following mediation.

The content of RSDT is simple and complex geometric designs, formed by the integration of solid and cut-out stencils, placed in relationship to one another in a meaningful sequence, leading to visual spatial and temproral perception. The language or modality of the instrument is essentially non-verbal, using figural information, with secondary numerical and verbal elements. There is a differential emphasis on the three phases of the mental act. The heaviest demand is

placed on the input phase, requiring systematic and accurate data gathering.

The goals of the instrument are to assess (1) the subject's capacity to learn a complex task through the use of representational strategies and problem-solving behavior, (2) the effects of mediational intervention on the subject's capacity to cope with tasks that become increasingly more complex, require higher levels of integration of information, and use reduced stimuli in the integration of parts into wholes, (3) the subject's capacity to develop a feedback system to determine the elements of a required sequence that have already been performed versus the elements which are yet to be performed, and (4) to evaluate the effects of mediation on the acquisition of task-specific prerequisites for successful and efficient task completion.

Mediation is primarily oriented toward representational thinking. The subject is encouraged to act upon internal reality to relate to transformations as they are present in the visual field. Through verbal descriptions of what is seen, exercised on the end-product of internally experienced superimpositions of the stencils, the subject learns to manipulate external stimuli internally. A second category of mediational process includes the labelling of color, shape, and orientation, as well as differentiating the relative size of similar shapes in the cut-out designs as a prerequisite for implementing representation. A third objective for mediation is the regulation of behavior, controlling impulsive behavior, stimulated by the pressure for unchecked verbal responses which tend to produce errors.

Numerical Progressions (NP): This test assesses the subject's capacity to understand and deal with relationships, identify them as rules, and apply them to building new information. The instrument consists of a series of numbers, arrayed in progressions, related through intervals and their order, and presenting a continuity and rhythm which the subject must deduce. The modality is numerical and graphic. The progressions of numbers are related to one another according to rules which are not identified but must be deduced from the available information. At the end of a sequence of numbers the subject is asked to supply the two missing numbers. A correct response indicates that the subject has understood how the numbers are related to one another. The subject may or may not be asked for the rule by which the answers were achieved. The instrument requires the use of

basic mathematical operations of addition, subtraction, multiplication, and division, as well as differentation, segregation, inferential thinking and deductive reasoning.

The format of NP is that of a Pre-Test, a Learning Page, and two forms of a Post-Test. On the Learning Page, the examiner mediates to teach relationships that are not understood and establish strategies according to an analysis of needs (errors and performance on the Pre-Test). Following mediation, the Post-Test is given to determine how well the subject has learned strategies for solving the problems. The parallel form of the Post-Test makes possible assessing the permanence and stability of what has been learned over time.

The goals of NP are (1) to assess the modifiability of the subject's capacity to educe relationships, define them as rules, and apply them in constructing and generating new information, (2) to assess the subject's acqusition of strategies necessary for the eduction of relationships and formation of rules, (3) to determine the ability to segregate different streams of progressions, based on different formulaic relationships hidden in the same task, (4) to assess the extent to which the subject formulates hypotheses and tests them through confrontation with further data, (5) to assess the subject's acqusition and/or accessability of number concepts, and (6) to assess the acquisition of various modalities of formuating rules and the use of them in further application to new situations.

Mediation is oriented toward creating conditions for recognizing the ordered sequence which leads to the establishment of a rule, and the establishment of strategies for systematic gathering of information. Establishment of principles (formulae and rules), responding to and solving sequences that present variations and adaptations of the educed rules, and developing strategies to apply to efficient task-solution are also mediational objectives. The establishment of insightful, hypothesis-generating thinking is an overall superordinate objective.

Deficient cognitive functions most often observed in the NP tasks are: lack of clear perception and systematic exploration, limited orientation to temporal and spatial elements in the perception of sequence and order, inability ot use two or more sources of information, impulsivity, lack of comparative behavior, inadeuate conceptualization of relationships, inadequate grasp of the direction of the progression, and an episodic grasp of reality.

Organizer (ORG): This instrument presents the subject with a series of verbal statements consisting of sets of items which must be organized according to closed, logical systems. The subject is required to place the items (colors, objects, people, etc.) in positions relative to one another according to the determined attributes or conditions presented in the statements. A series of statements or premises are presented in each task. Each premise permits the extraction of only a part of the needed information required to determine a full and precise placement of the items. Thus, the subject must gather available information, develop hypotheses, test the hypotheses with succeeding information given, and generate information which is not immediately available in the given propositions. The tasks become more complex because of more units of information and the level of inference needed to solve them. What is assessed in this instrument is the subject's capacity to gather new information through the use of inferential processes, formulate hypotheses and test them according to new information or assumptions generated, and apply strategies for discovering relationships.

The instrument consists of Pretest, Learning, and Test phases. The modality is verbal, with a numerical sub-component. The content of the instrument is known and familiar items that must be organized by gathering, storing, and retrieving information as the source of inferences regarding position relative to one another. The ORG instrument requires the operations of decoding, encoding, representation, inferential thinking, transitive thinking, propositional reasoning, negation, with a heavy loading of mnemonic (memory) functions.

The goals of ORG are (1) to assess the subject's use of given information for the purposes of gathering new information using inferential elaborational processes, (2) to evaluate the subject's process of systematically formulating and testing hypotheses through confrontation with additional information, (3) to assess the acquisition and application of strategies for educing relationships through evaluation and analysis of complex verbal information, and (4) to assess the subject's propensity to modify levels of efficiency in using inferential elaborational processes.

Mediation at the input level is oriented to modes of gathering data, with an emphasis on organization and the facilitation of the search for relationships. As needed, strategies are offered to facilitate this proc-

ess. This instrument requires more task-specific mediation from the examiner, and the use of both inferential and more concrete and "mechanical" strategies as they are required by the subject. Various strategies and mediational processes are taught in the tasks. For example, the examiner may need to equip the subject with labels dealing with orientation, succession, order, proximity, and distance, following the more basic processes of differentiating the information that exists in the problem and creating strategies for registering and storing information.

Current Status of the LPAD: Research and Clinical Applications

As indicated at the outset of this paper, dynamic assessment in general and the LPAD in particular have been subject to a great deal of critical analysis, and extensively researched. Any review of the current "status" of the LPAD should reflect this considerable body of activity, and in addition consider the clinical applications (training, assessment practices, new developments) of the process and procedures. That will be the focus of the final section of this paper.

Critical Evaluation of the LPAD

Much of the critical analysis of the LPAD rests on its comparative and contrasting characteristics in relation to traditional psychometric methodology. As the progenetor of the field of dynamic assessment, it has served to frame and stimulate what has come to be considered an "alternative" approach to psychoeducational assessment, which has both adopted and adapted philosophy, methodology, and in limited instances instrumentation. It has also, in this context, been subjected to considerable critical analysis, in relation to the genre of dynamic assessment methods, and in its own right. In this section, the critical analyses will be summarized, without rejoinder (for an extensive discussion of these issues, the reader is referred to our book, The Dynamic Assessment of Cognitive Modifiability [Feuerstein, et al., 2002]).

Jitendra and Kameenui conducted a comparative and critical review of the then most prominant dynamic assessment methods, including the LPAD (1993). After reviewing each of them from the per-

spective of structure and procedures, they summarize their views on the "limitations" of each approach. With specific reference to the LPAD, they identify five areas of concern:

(1) **construct "fuzziness":** the phases of the mental act are not as distinct as Feuerstein claims, in that it is hard to determine how impairments in one phase effects or is affected by impairments in another; the criterial for analysis of failure are not clear; nor can one clearly "determine which factors operate to explain deficiencies" (p.12),

(2) **procedural spuriousness**: the techniques have not been empirically tested or authenticated by research (other than by those who developed them); leading to "difficulties in interpreting the magnatude or ... significance of effects" (p. 14);

(3) instructional aloofness: the tendency of research to use comparisons to IQ-related reasoning tasks makes the results seem removed from the classroom learning issues of concern to teachers, etc., leading to limits in generalizability;

(4) **instrument inadequacy**: operational procedures have not been adequately developed or tested; in the specific instance of the LPAD, the requirement that the examiner make "high-level inferences.... (leading to implementation which may) contribute to inappropriate test interpretation" (p. 14);

(5) **labor intensiveness**: the tendency to require individualized testing makes the approach time consuming, with the skill analysis and methodology (of test/retest and mediational intervention) further extending the time needed to complet the procedure; group administration formats are identified as addressing some of these issue, but not as well described.

Other critics of the LPAD have focused on one or another of these general issues, framed from the perspective of validity and reliability concerns. Buchel and Scharnhorst (1993) raise concerns regarding the logical and conceptual foundations of the diagnostic hypotheses that are generated by the LPAD assessment process. They question operational definitions of mastery and grasp of the principles of what is being learned, and imply that the instruments and procedures utilized may not fully elucidate them. They argue for "distinguishing operations from strategies and relating them both to specific contents and modalities. This would help to clarify what can be observed with LPAD

tests" (p. 98-99). Bradley (1983) and others have criticised inter-rater and test-retest reliability, and the imprecise use of theoretical concepts (1984).

One response to these kinds of concerns has been developed by Guthke and his collaborators (Guthke, 1990; Guthke, Jager and Schmidt, 1983) in the development of instruments and procedures which control for the variables of reliability, validity, curricular relevance, etc. Among other issues that such efforts attempt to deal with, and by implication represent criticisms of the LPAD approach, are scoring procedures, norm-referenced interpretations of results, and the product/process orientation (in the direction of being more "product" oriented). In all of these, the unique and specialized goals of the LPAD are under critical analysis, and address the particular purpose of the LPAD approach to dynamic assessment. In each instance, exactly what the "learning test" approach, and other similar modifications of dynamic assessment developed to address these issues, it is explicitly in the specific nature of the LPAD philosophy and procedure to treat these factors in the way that it does (as examples: scoring is non-normative because the comparisons are between "entry-level functioning" and after the "post-mediational" intervention; conventional reliability indices would deny or factor out the variability which one is attempting to observe and produce within and among the functions being assessed).

Grigorenko and Sternberg (1998) conducted an extensive review of the field of dynamic assessment, and thorough analysis of the LPAD. They are quite critical on a number of grounds--conceptual, methodological, and empirical. Empirically, they conclude that very little of the research on the LPAD has been subject to or published within scientifically reliable (peer-reviewed) sources. They thus hold that results relating to the LPAD are difficult to evaluate, and the conclusions regarding outcomes are not reliable indicators of true effects. For example, they hold that "despite vast amounts of data accumulated by the LPAD proponents in various studies, very little attention has been given to questions of either construct or criterion validity...factor analytic studies have not been published, so there is no evidence that the structure of the LPAD corresponds to the major parameters of the proposed cognitive map" (p. 84). In our view, such a position is valid regarding issues of reseach design, but not sufficiently sensitive to the

particular characteristics inherent in dynamic assessment which argue for different research paradigms, and different ways of framing the variables to be studied.

Similarly, Grigorenko and Sternberg's discussion of the issue of the predictive power of the LPAD is couched in research design/methodology terms, and reflects the same biases toward statistical and criterion referenced outcomes. They do not accept the framework which is central to the LPAD-changes in the cognitive functioning as the primary goal, with resultant changes in academic performance, socialization processes, self concept, etc. following intervention. Again, in our view, such criterion-referenced predictions miss the mark of the essence of the LPAD, and more general goals of dynamic assessment. The same could be said for criticisms regarding standardization, and reliability indices (of changes in functioning). Nonetheless, they cite a study by Shochet (1992) which demonstrates reasonable and meaningful "predictive power" of the LPAD procedure under controlled conditions. We would further mention a study (not included in the Grigorenko and Sternberg review) by Rand, Mintzker, Miller and Hoffman (1981) which not only demonstated predictive power, but more importantly, a "divergent effect" wherein the predicted differences in performance related to dynamic assessment and intervention were manifested at the immediate end of the intervention, but also (with increased amplitude) three years following the termination of the intervention.

There is other research suggesting that issues such as inter-relater reliability and construct validity can be studied, and show the LPAD to have a functional and practical consistency that is not recognized by many critics who approach the issues from a more traditional scientific/psychometric perspective. What is needed is a willingness to consider a new paradigm, and structure analyses on the basis of it (see Tzuriel, 1992). Tzuriel's work has been directed toward the answering of the ongoing proponents of traditional psychometric approaches, who continue to argue for the benefits from such procedures, and raise both functional and practical disadvantages to dynamic assessment (cf., Frisby and Braden, 1992; Braden, 1999; Frisby, 1999).

These issues notwithstanding, there is widespread general agreement of an important role for dynamic assessment as a needed alternative approach for a number of special needs populations. The

seminal historical role of the LPAD is also largely unquestioned. Much of the argument centers around technical aspects of structure, application, and outcomes of the LPAD as a dynamic assessment procedure in contrast to both the psychometric movement, and to a lesser degree to the specific content (curricular domain) perspective (since the LPAD is particularly non-content specific, and cognitively "generic" in its structure). There has been considerable research on important corrolary issues of the use of dynamic assessment, on such variables as teacher perceptions of student performance and their ability to observe and modify their responses to the students needs, observations of cognitive functions and deficiencies in otherwise high functioning (e.g., gifted students, university students, etc.) individuals (Kirschenbaum, 1998), adult related job-performance outcomes (Flesher, 1993), etc.

There is no question, however, that there are many aspects of the LPAD that continue to need research. Grigorenko and Sternberg (1998) indicate that the LPAD has "provoked more research than any other dynamic assessment approach" (p. 89). Scholars who have conducted meta-analyses of the many studies on dynamic assessment recognize the complexity of variables that need to be considered to fully understand the nature of the processes and specifics of outcome—comprising variables such as sample sizes, ages of populations to which the procedure is applied, functional levels and needs of subjects, number of sessions required, type of training needed for examiners, among a host of others (Resing and Wubbe, 2003).

Summary and Conclusions

We have presented the theory, methods, and structure of the LPAD. Our emphasis has been in its current development and use. We have also reviewed the current state of critical evaluation of the LPAD, within the genre of dynamic assessment. The authors obviously have a committment and bias toward the utilization of this methodology, which was clearly conveyed in this paper. We were not able to present the fully articulated rationale, and the clinical and methodological support for it. For this, we encourage the reader to turn to our book, The Dynamic Assessment of Cognitive Modifiability (Feuerstein, et al., 2002) for elaboration. However, we will end this paper by summarizing

what we believe to be the critical issues, from that book:

The assessment of cognitive functioning and the propensity for modifiability places unique demands on process and methodology, calling for a willingness to act outside the constraints of the psychometric paradigm. (To the extent that other approaches, including those that are dynamic) are organized, to greater or lesser degrees, around the expressed need to maintain some of the methodological and underlying philosophical alliegiance to the psychometric model, ...such constraints on design and process improse severe restrictions on the potential for an adequate and meaningful evaluation of the modifiability of the individual (p. 126).

The test of the efficacy of dynamic assessment--whether it makes a difference in the lives of people--is the extent to which it leaves the confines of academia, and enters the schools, clinics, and becomes a part of the repertoire of tools of helping professionals in dealing with individuals confronted with the need to shift to new modalities of functioning. In this regard, the LPAD, as an application of the paradigm stands alone (p. 127).

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SHIFTING PERSPECTIVE: DYNAMIC ASSESSMENT OF LEARNING PROCESSES IN CHILDREN WITH DEVELOPMENTAL DISTURBANCES

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Abstract: This article elaborates three case studies of children - one with autism, one with brain damage and one with Down syndrome whose learning processes were evaluated using Feuerstein's LPAD (Learning Propensity Assessment Device). The dynamic evaluation showed the children's modifiability, their capacity for higher abstract thinking and development. This opened up a different perspective on the child's educational potential and consequently a more active educational intervention. The examples have been drawn from a series of 250 children with learning disabilities, with varying degrees of severity and etiology, whereby Feuerstein's LPAD (Learning Propensity Assessment Device) has been performed. The LPAD is based on Feuerstein's theory of Mediated Learning Experience and Structural Cognitive Modifiability, which basically has a dynamic and constructive view on intelligence. In dynamic assessment there is a teaching phase and the examiner interferes with the process, so as to produce a mediated "peak" performance. The examples show that test outcomes may be significantly higher after mediating learning processes and strategies. They show what kind and amount of mediation are needed to bring about change. They suggest that dynamic assessment may bring about a positively influential cycle in the family and school system and is more suitable for educational planning than a classic, psychometric and static testing paradigm.

Introduction

In educational counseling, "classic" psychometric testing is often deceptive. It is called "static" because the child's performance is measured in a static way, no changes are recorded and no intervention is allowed by the examiner, this for the sake of so-called objectivity. While originally conceived by Binet as an instrument to plan education, psychometric testing has been criticized for reinforcing pre-established pessimism, for not going beyond a mere labeling of dysfunctions, for lack of giving proper advice as how to change the child's learning, for not doing justice to the child' potential (Dias, 2001). Psychometric testing however is a short and relatively cheap way to rank a child's performance in a population of the same age and may give quick information as to diagnosis.

Feuerstein et al. (1979) criticize the psychometric testing paradigm for being too "static": it is static because it is based on the assumption

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that intelligence is a static property of the individual, which can supposedly be "tapped" by adequate measurement. This leads to the assumption of a limited intellectual capacity and consequently to lowering the level of expectations, the level of abstraction, the amount, complexity and functionality of what is offered to the child. IQ testing is often accompanied by recommendations to parents to accept the "inevitable" truth as it is, whereby "inevitable" has a connotation that intelligence will remain low and the child will not be able to learn. Sometimes counselors increase parents' guilt feelings when parents try to increase the child's level of functioning, which they label as "lack of acceptance". Not all parents, however, resign to the child's low test outcomes and look at it in a different way. This is not always a sign of denial of the truth. They often know "intuitively" that the child has more potential, than is becoming manifest in classic psychometric testing. But how can this intuition be objectified better?

As an alternative, a more dynamic model of evaluation has been proposed (Feuerstein et al., 1979; Feuerstein et al. this issue; Tzuriel, this issue). The underlying postulate of dynamic assessment is a dynamic model of intelligence. Feuerstein uses the concept of modifiability of the individual, indicating that what matters is how an individual may become modified by stimuli, and adapts himself to changing circumstances. Cognitive functioning is seen a dynamic, multifaceted, complex behavior, not a priori determined from birth. Individuals may be impaired in their cognitive performance due to various reasons, external or endogenous, but the resulting cognitive dysfunctions are considered as fluctuating states of the individual rather than permanent traits. In this sense dynamic assessment transcends the labeling and categorization of children in diagnostic categories. There is a continuing spectrum of cognitive and learning behavior functioning, which does not allow a discontinuous split between "normal" and abnormal. Every individual may have autistic behavior or cognitive dysfunction from time to time. According to Feuerstein, every individual is modifiable, whatever etiology or level of dysfunction. Modifiability can be enhanced or reduced.

While Feuerstein's LPAD is being increasingly practiced by learning therapists, psychologists and evaluators, it is often criticized for lacking scientific scrutiny and standardization. Can LPAD really show modifiability? How does the mediation process take place? If the as-

sessment situation, objectives and interaction are not standardized, how can LPAD give valid and reliable results? In view of the time consuming process of dynamic assessment, is it really advantageous as compared to psychometric testing in offering guidelines for educational counseling? Although this paper will not be able to offer scientific scrutiny to LPAD, it's purpose is to clarify some of the issues with a more in-depth case study of children with serious developmental disturbances, illustrating how LPAD may trigger a shift in perspective in the child, parents as well as teachers.

Materials and methods

This article elaborates three case studies of children - one with autism, one with porencephalic brain damage and one with Down syndrome – whose learning processes were evaluated using the LPAD. The examples have been drawn from a series of 250 children with learning disabilities, with varying degrees of severity and etiology, whereby Feuerstein's LPAD (Learning Propensity Assessment Device) has been performed, at their parents' request. The LPAD's took place within the context of small clinical- therapeutic learning centers in the Netherlands, Belgium and Italy, not linked to a particular hospital. All children are living with their families and go to school. Cases were selected from the database on the basis of their representativity, the accuracy and completeness of their records.

A full description of the LPAD test battery is given elsewhere (Feuerstein et al., 1979 2002, this issue). Some of the instruments are derived on psychometric test items developed by André Rey (1934) and Raven (), but have been adapted by Feuerstein in procedure and interpretation. The LPAD is mainly a qualitative instrument, in the sense that the changes in the child's learning are evaluated being dependent on the quality of mediation (teaching). A dynamic test contains a learning phase during which the "tester" intervenes as a mediator to teach concepts and strategies. Afterwards the child is evaluated again to see to which degree it has learnt new behaviors. In individual LPAD mediation is included into each stage of problem solving, not only at the end. In contrast to other dynamic assessment batteries or learning tests, mediation is not standardized in Feuerstein's LPAD: its purpose being to demonstrate modifiability, one has to mediate until the child

shows a higher level of functioning. This may need a variation in intensity and proximity of mediation, according to the needs of the child. The goal is to evaluate change in the child's behavior in four domains: cognitive functions, mental operations, affective/motivational factors and learning efficiency (concentration, speed, attention span). Dynamic assessment evaluates the degree and kind of mediation which is needed to bring about change. Changes are essentially qualitative in nature. Scores are only useful to compare with the child's non-mediated performance, not with standards.

Child 1: M, a boy with hemiplegia and cognitive deficits

Michael was a normally developing child until he was operated for a brain tumor (microcellular astrocytoma) at the age of 4. Post-operationally suffering from frequent and hardly controllable epileptic attacks and behavior disturbances, he was operated a second time at the age of 8. While epilepsy and behavior disturbance had been greatly improved, in turn he remained with a spastic left hemiplegia. He went back to his inclusive primary school in a wheelchair. School work; however, appeared to be very difficult because of serious cognitive difficulties. He regressed to a mental state of a child of three years. He had lost independent walking, reading and writing. Thanks to a deeply committed speech therapist, he relearned to walk again, to read and to write, but psychologically he remained very, dependent, depressed and cognitively much delayed. He had to change primary school because there were not enough possibilities to give him sufficient support. At the age of 12, he started to recover more, he became more communicative, he started to become interested in sports, in reading the sports results in the newspaper, his level of attention increased and he was more interested in studying. His parents were supportive, but overprotective. Most of the activating work was initiated by his speech therapist, who acted as a developmental therapist and learning coach. She saw him on a daily basis, went to work with him at school, discussed the program with all people concerned, and took care that the program was challenging and stimulating enough. He became less depressed, joined in school work and in social interaction: he joined a handball squad, which he was perfectly able to do. At the time of tran-

sition to high school, at the age of 15, because his intellectual difficulties were obvious and he had a few years of retardation in schooling in certain topics such as math, a psychological examination was requested, with the purpose to determine his intellectual capacities, in order to find out what schooling would be suitable. It turned out that on the WISC-R Michael scored 49. There were many deficits in verbal as well as performance components of intelligence, in abstract thinking and problem resolution.

His static report summarizes deficits as follows:

Age	15
Diagnosis	medium to light mental retardation
Etiology	Post-operative hemiplegia following astrocytoma at age 4 and 8
Quantitative test results	IQ v75, IQ p 48, IQ t 59
Cognitive deficiencies	Defects in visuo-spatial functions Difficulties in linguistic integration, spelling, writing Short term and long term memory and memorization deficit Automatisation problems in arithmetic Problem solution difficulties "Typical problems with planning, control, generalization and constant need for a mediator"
Recommendations	work at adaptation skills teach how to use public transport, money, social contacts outside school vocational training

Table 1. Michael, a boy with hemiplegia and cognitive deficiencies, static test report data at age 15

For his lack of abstract thinking skills and his slowness, it was recommended that education should remain as much as possible on a concrete level and he was referred to vocational training. The prognosis was that he would probably not be able to go beyond manual jobs and he would need to be under constant supervision all the time. His

parents and therapist were not ready to accept these low expectations. Then Michael was evaluated by the author with Feuerstein's LPAD battery. The LPAD took 6 sessions for a total of 12 hours.

It appeared that, though Michael's initial scores without mediation were relatively low, his performance increased significantly after mediation.

Probed mental operations	Used instruments	Results pre-test	Results post-test
Tests of visual analysis and abstract logical thinking	Raven's Colored Progressive Matrices	23/36	36/36
	Feuerstein's Variations on B8-12	26/30	30/30
	Feuerstein's Variations I A & B	9/12	12/12
Visual memory	Associative Recall and Functional Reduction	7/20	18/20
Auditory memory	16 Word Memory Test	8/16	16/16 after 8 trials
Positional memory	Positional Learning Test	16 trials	14 & 10 trials
Higher order perceptual analysis and synthesis	Representational Stencil Design	0/20	5/20
Seriation and numeracy skills	Numerical Progressions	1/15	15/15

Table 2. Michael, 15 years, hemiplegia: list of instruments used in dynamic assessment with Feuerstein's LPAD. Explanation of test procedures, see Feuerstein et al. 2002. "Trials" means attempts to memorise correct words (in 16words test) or positions (in positional memory test) until the criterion is reached of three consecutive correct solution.

In the assessment, the same cognitive deficiencies appeared as had become apparent in the classic WISC: he was unsystematic in data gathering, he lacked verbal labels to differentiate, he did not integrate information adequately, he was unable to name a position correctly, he did not compare adequately, he did not adequately generate hypotheses, nor did he check them enough; lacked planning and he was many times too impulsive in giving an answer, tending towards trial and error. His actual cognitive performance was sometimes very low, e.g. when asked what is the next number in a series 32, 34, 36, …, he said 37. He lacked also flexibility in changing strategies when needed.

He had difficulties in analogical thinking, logical multiplication and analytical perception.

However, when he was encouraged with mediation to reflect about his answers, to look at the data in a more systematic way, to analyze and attach proper vocabulary to what he saw, he always found the correct answer. Table 2 gives an overview of the kind of mediation that was provided during the Raven's matrices.

Examples of mediation given in Raven's matrices	
Mediation given	**Observed changes**
• Regulate behavior; stop his impulsivity in looking at the data • Focusing: attend to details • Mediation of logical evidence after correct answer: how do you know? What is the worst and why? • Mediation of comparing: in what way are they the same and different • Vocabulary: teaching him words that are needed to distinguish, e.g. vertical/ horizontal, diagonal, think-thin; curved line - straight line, widening-approaching • Mediation of superordinate concepts of shape, number, size, direction, , position, distance, width, identity; • Cover the answers and let him verbalize the answer before pointing at it • Combining two sources of information simultaneously: what's changing vertically and horizontally? • A lot of regulation in the output level: "say only the correct answer when you know it surely"; • He had to learn new reasons why an answer was correct • not only did he justify better, he also resisted to an attempt to make him doubt • Mediation of vocabulary to designate position in 2 dimensions simultaneously, e.g.: upper-left: very intensive mediation needed, first in 3 dimensional space, then on paper • Mediation of the feeling of competence: comment his answers positively and give feedback • Teaching strategies and principles	• More reflective • Better perception and discrimination • Better use of words and discrimination in next item • He spontaneously tried to justify his answers and could do so correctly • he used previously learned concepts of vertical/ horizontal, diagonal • He had to be solicited each time; he learned these in the course of one session, but with difficulties; he tried to use them the next session. • He applied previously learned concepts more and more correctly and spontaneously • His visual transport improved, i.e. he did not deform the data anymore while transporting them visually to the other end of the page • combining two sources simultaneously at first proved impossible, but then he learned the rules of analogy gradually; B10 and B12 he did perfectly without mediation

Table 3. Examples of mediation provided during the learning phase of the Raven's Colored Progressive Matrices

In general, there was a big discrepancy between what Michael showed without mediation (relatively poor results) in "classic" abstract intelligence tasks, and what he was able to do with mediation.

Also in the memory tests he showed definite problems with visual, positional as well as auditory memory. The main reason for that being his impulsivity, but also because he lacked a spontaneous habit to relate and organize the data. In the visual memory test, it was sufficient to teach him to focus and ask him why things related, to obtain a maximum score. Similarly, in the auditory memory test, where he had to memorize a random list of 16 words, he first did not look for any relation, thus memorizing only half. By making him aware of the fact that he had already associated e.g. two animals in the list, and suggesting this could be a strategy to look for more similar relationships, he started to categorize. Then he also had to be made aware of the need to count as a memory strategy.

In the course of the mediation process, it became apparent that Michael definitely had a capacity for abstract thinking, learning concepts and practise them in a meaningful way. There was no inherent memory defect, but a deficit in memorization and retrieval for lack of strategies, which could be resolved by teaching him better ways to organize. Higher abstract thinking skills and complex logic appeared perfectly accessible for him. They could be taught, remembered and applied in different contexts.

Area of intervention	Recommendation
► Schooling:	► Continue general education in mainstream high school with general knowledge subjects languages, math, history, geography, philosophy, art
► Individualized education program and evaluation	► Reduce level of complexity, select key concepts, reduce quantity, individualize evaluation, give more mediation for each subject
► Monitoring schooling	► Learning Coach (therapist) has daily contact with teachers' team and with assistance at home ► Organize in the beginning monthly meetings with team ► 3 x per year follow up with dynamic assessment
► Assistance	► Work at school, both within class as separately; provide 1 to 1 mediation outside class during 1to 2 hours per day ► Work daily with an individual teaching assistant at home, to elaborate homework
► Cognitive rehabilitation:	► Feuerstein's Instrumental Enrichment; all instruments; minimum frequency 2 times a week, preferably 3 ► Working at stopping impulsivity, improving systematic search, analysis, correct labeling, correct use of spatial concepts, comparison, categorization, integration of information, organization of information, planning, hypothesis testing, stopping trial and error
► Home	► Modifying environments: mediate the acquisition of daily autonomy skills in a structural way, this means by making him think and plan, e.g. how to get somewhere, how to use public transport, insight in the public transport system, learn to deal with complexity, how to make & keep social relationships ► Mediate the parents how to mediate their child, how to foster autonomy, how to think; discuss problems in a thought-enhancing way

Table 4. Michael, 15 years, hemiplegia with cognitive deficiencies: recommendations after LPAD

Doing the LPAD provoked a profound change of perspective in both Michael as well as his parents. Although the anxiety for a future life of disability had not disappeared – they were realistically enough to

realize that his problems were not going to disappear entirely - they felt relieved from the “doom” of a permanent life of mental disability. They understood that they had not had a delusion, but that is was now shown black-on-white in the test results that it was justified to hope for modifiability. That provided them with renewed energy. An intensive coaching program was set up to organize inclusive education, to organize family support, a modifying home environment, individual coaching as well as a cognitive education program.

Michael gradually catched up his delayed schooling and his cognitive difficulties dramatically improved, to the point that he was able to graduate high school with the same standards as his non-disabled peers, the only adaptation at examination time being the possibility to do an oral examination in the presence of his study coach. But in reality, what gave him the most important self-esteem was his passing a drivers’ license. He entered a university sports college because he wants to become a sports teacher for children with disability.

Child 2: A boy with autistic spectrum disorder

Harry is a now 15 year old boy with a history of autistic behavior from kindergarten age. He had had a history of frequent respiratory infections during infancy with frequent antibiotics. When he was two, he seemed a normal boy, though a bit slower and clumsier than his sisters at that time, the family lived abroad due to his fathers’ job, and he was first sent to a local kindergarten. That was not a success, because he started to withdraw, he sometimes screamed and covered his ears; this indicating a hyperacousia. Then he changed to a foreign language kindergarten. During that kindergarten time, big cognitive and social difficulties became apparent. He withdrew, became preoccupied with spinning objects and did not want contact, he did not look into the eyes, he screamed when someone tried to counter what he had in mind. His kindergarten teacher was very understanding and managed to include him and make him feel better. He needed a lot of individual instruction.

Coming back to his country of origin and mother tongue did not improve the problems. His parents thought it would be better to send him to the international school, in order keep the same instruction language. But that later appeared not to be a good decision. The prob-

lems in fact became worse. At the age of nine, a formal diagnosis of autism has been made. Its etiology is unclear. One of the (unproven) hypothesis is a perinatal brain damage due to difficult forceps delivery, another is an adverse immune reaction after MMR vaccination; but there is certainly also an environmental factor. It was impossible to leave him in the international school in this state, he did not benefit at all. He was transferred to a special school for children with learning difficulties. Learning remained difficult in group. At the end of the primary school period, he had a serious academic delay as far as arithmetic, reading and spelling were concerned.

In the mean time his parents tried with him various alternative treatments: they started a home-based program with volunteers, based on the method of Son-Rise (Option Institute US Mass.); thanks to this Harry gradually became more open to mediation and more involved; he started looking at people, became more sociable. Then they started a gluten- and milk free diet. Then Harry had some osteopathy because an atlantic dislocation had been diagnosed, after which he started to speak better (his parents claim a causal relation between these two events, but this is hard to prove). All three approaches seemed to have made major changes in behavior.

Initial psychometric testing led to formulating recommendations in terms of: special schooling and lowering the expectation level (table 5). Because the results did not come up with serious recommendations as to how to improve Harry's learning, Harry's parents requested a dynamic form of evaluation. At the age of 12 we performed a dynamic assessment of learning propensity based on Feuerstein's LPAD. Results are shown in table 6.

Age	Test results	Test results	Recommendations
9	**IQ 64**	"way below average; limited cognitive potential , language retardation, information processing, perceptual organization; defects in social skills, personality disturbance, lack of fantasy, lack of impulse control	• Referral to special school ZML = low level • Offer structured environment • Reduce too stressing situations
11	**WISC-R t IQ vIQ71 p IQ 78;**	difficulties with verbal comprehension, math concepts, representational thinking, planning, eye-hand co-ordination, visual memory, but improved as compared to 9 years; problems with attention, self-organization, oppositional, lack of perseverance	• Referral to special school ZML • Offer structured environment • Reduce too stressing situations
12,5	**IQ 92**	after cognitive-mediational intervention	

Table 5. Results of psychometric testing. H., diagnosis of autistic spectrum disorder

Probed mental operations	Used LPAD instruments	Results pre-test	Results post-test
Test of visuo motor praxis	Organization of Dots	80/80	
	Rey's complex figure	13/36	35/36
Tests of visual analysis and abstract logical thinking	Raven's Colored Progressive Matrices	34/36	36/36
	Feuerstein's Variations on RSPM C, D & E	32/38	38/38
Visual memory	Associative Recall and Functional Reduction	12/20	20/20 (12/20 free recall after 30')
Auditory memory	16 Word Memory Test	6/16	16/16 after 9 trials
Positional memory	Rey's Plateaux test (variation by Feuerstein)	11trials	6, 3,3, 1 at rotations
Higher order perceptual analysis and synthesis	Organizer	0/10	7/10
	Representational Stencil Design	18/20	20/20
Seriation and numeracy skills	Numerical Progressions	5/15	15/15

Table 6. LPAD battery with 12 year old boy with autistic spectrum ("Harry")

In the *Organization of Dots* test (Feuerstein, 2002), he did not need a learning phase and he performed perfectly without mediation. It has to be said that he had had some experience with this type of exercises and that this non-verbal modality particularly suited his motivation. In the *Complex Figure* test, however, which he had never done, the real difficulties emerged. This task consists in reproducing, first copying, and a complex, abstract, figure. In a second phase the learner has to reproduce it from memory (Rey, 1941). Feuerstein (2002) added 4 more phases to this test: a learning phase, in which mediation is given to correct for various deficiencies. Then in phase 4 and 5, a reproduction is again requested, first copying, then from memory. In a transfer task, the examinee is requested to point at planning and structure in similar complex drawings. Results show Harry's perceptual and praxis difficulties (fig. 1): he does not sufficiently integrate information; the copy is distorted in proportion, because he has no concepts, does not adequately compare or relate components to each other and a frame, is not precise enough and has little strategies to plan.

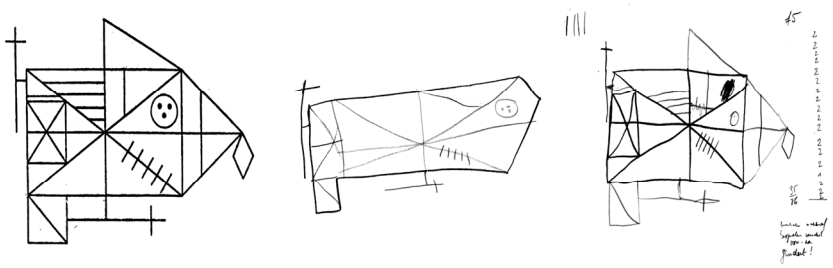

Figure 1. Complex figure of Rey, in a dynamic mode, with a 12 year old boy with autistic spectrum disorder (Harry). The left is the model. In the middle in the first memory reproduction. The reproduction is poor due to lack of focused perception, lack of concepts, lack of integration of information, lack of planning. After the mediation phase, the autonomous memory reproduction dramatically improves

The type of mediation is shown in table 7.

Examples of Mediation in copying and remembering Complex figure
• Analysis + naming: what structures can you discover?
• Regulation of impulsivity: STOP and look!
• Important KEY questions: *what* do you see? (Gives information about shape) *Where* is it? (Gives info about place); *how* is it placed? (Info about orientation and position); *How long, how big*? *Until* where are you going to draw this line? (Size); *when* can you draw it? (Order), *how many* (number), *how far* from each other (distance).
• Vocabulary of shapes
• Vocabulary of spatial concepts: horizontal, vertical, diagonal, right angles, parallel, "at the same height", etc.:
• Comparison: where is that point in relation to the two others? (e.g. in the middle)
• Clarification of concepts (e.g. "middle": what does it mean?
• Need to count and be precise
• Relationships between parts and whole, and between parts
• Planning: what do to first in order to ensure that everything will be on the right place, the right size, etc.
• Systematic exploration: e.g. doing first the inside, then the outside; do it clockwise, or counter-clockwise
• Precision of data gathering and of output in drawing
• Combining all the criteria
• Check your work before drawing

Table 7. Examples of mediational intervention in phase 3 of the Complex Figure administration

One can see the difference between mediation and direct instruction: here, in principle, no direct instruction is given – only when the child would not benefit at all from mediation. Mediation is about teaching strategies, teaching to think. After mediation, the quality of the drawing dramatically improves. He also was able to some amount of transfer, by indicating the proper order of more complex similar drawings, thereby using proper vocabulary. Similarly, in a subsequent *Representational Stencil Design Test*, some weeks after the successful completion of the complex figure, he showed his capacity for memorizing strategies and transferring them to a complete different test. He almost did not need mediation. It shows how perceptual and organiza-

tional difficulties, known in children with autism, are temporarily and can be modified by a mediational process.

Memory skills, reportedly poor in previous "static" testing procedures, now appeared that they could be elicited by mediation. Indeed, the pre-test results were the same as during the static IQ tests, but the post-test results were normal. In the *16-Word Memory Test* (Feuerstein et al., 2002), mediation was given after four unsuccessful attempts to memorize the whole series showed no improvement or learning effect. Metacognitive questions were asked to suggest some way of linking and organizing the data and count them (table 8). The examiner takes notes so as to be able to construct a learning curve (Fig. 2)

Examples of Mediation for remembering auditory information
- Why did you tell "cat and horse" one after the other while I did not tell them that way?
- Because they belong together!
- Good! You grouped them together, things that are similar in some way. How do they belong together?
- They are animals
- Wonderful! Are there any other animals?
- Yes,….
- Do you recognize any other groups of things that go together?
- Things to be used at school
- How can you name these things?
- Etc.
- You can use these groups to remember better. It's easier. Now I ask you to try to listen carefully and put the things together in your mind.
- (again listing the words at random)
- I want you to tell all the words that belong to this group
- How many were there?
- (the process is repeated for other groups)
- (Repeat the whole list in the same random way until all words are remembered).
- Could you please write down the words and group them? Then numerate each word.
- Congratulations, you found them all!

Table 8. Examples of mediation given to memorize a random list of 16 words: mediate towards categorizing and numbering items

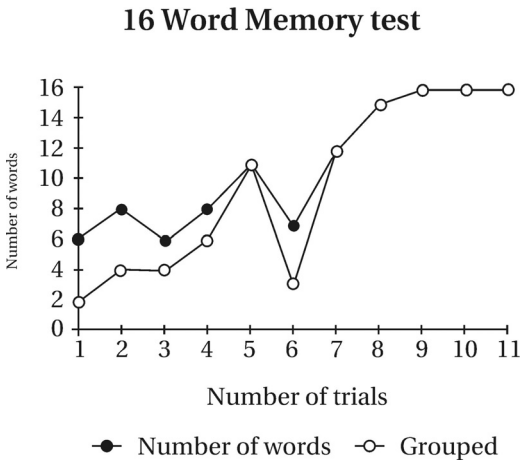

Figure 2. Evaluation of auditory memory with the 16 Word Memory Test in a 15 year old boy with autism. The first trials, memory is poor, due to lack of organization of the data. When he is mediated to organize in groups, his memory increases, then drops, because he is putting too much effort in categorizing. But after 9 trials, results are perfect.

Other verbal tests such as the *Organizer* (Feuerstein, 2002) showed that he had potentially good inferential thinking, but bad reading. He interprets sometimes wrongly. He had very limited capability to generate hypotheses and hardly strategies to verify them. This all normalized after mediation. In the *Numerical Progressions test* (Feuerstein, 2002) it appeared that he had inefficient arithmetic, through lack of experience, but he was able to learn and apply rules.

In *conclusion*, the LPAD confirmed the cognitive deficiencies that had been found on initial IQ testing, but also demonstrated their modifiability with mediation: he became better in focusing, less unsystematic and impulsive in data gathering. His visual dyspraxia was largely caused by this, as well as by an unstable spatial reference frame. Through mediation he learnt to adequately use spatial concepts and planning, which improved his dyspraxia. His initial inefficient reading improved after regulation, and he understood better. His habitude to block and stop searching when he got stuck, changed to an attitude to be more flexible in choosing strategies. His autistic withdrawal symptoms appeared to be stress induced, and were also highly modifiable. He was very cooperative, motivated and easy to mediate. He was bright without mediation in some areas (colored pattern analy-

sis, organization according to model), but could be said to be bright with relatively little mediation.

These conclusions were rather different than the ones obtained from initial IQ testing. Hence different measures were recommended. Rather than reducing the level, it was recommended to do with him daily reading comprehension tasks, increase the math level steadily, increase frequency and intensity of math, and teach him general subjects such as history and geography. To improve his constructive dyspraxia, cognitive rehabilitation was recommended through individual and group application of Feuerstein's Instrumental Enrichment program, and more mediation and cognitive analysis in daily life situations. Rather than totally avoiding stressing situations, it was recommended to teach Harry how to cope with changes, how to deal cognitively with complex social situations. Parents were encouraged to look for schooling with non-disabled children.

He was enrolled in a cognitive enrichment programme, using Feuerstein's Instrumental Enrichment programme and metacognitive academic subject lessons, in the context of a small centre outside the school context, once a week, with an additional session with another cognitive rehabilitation therapist. The cognitive changes became visible already very early after the start of this programme, not only in terms of his daily behaviour and school performace, but also in normalized IQ scores, during a psychometric test done by an independent tester. Two years after this intensive program, he transferred to a mainstream vocational school, in which he is still successfully coping and studying. He has almost "normalized" social behavior and is continuing to thrive.

Case 3: W, a boy with Down syndrome

Willy is a now 11 year old boy with Down syndrome, born as the 9th child in a family of 11 children. He went to a mainstream kindergarten, which at that time was still considered unusual in Belgium. During kindergarten time he participated reasonably well in the group process, but it was difficult to teach him the individual tasks other children were doing; he had difficulty in grasping concepts of shape and number; in grasping social rules; he had a very short attention span, he was impulsive, he had serious language delay (he spoke in 1-2 word sen-

tences and was difficult to understand) and he had a rather strong tendency to do his own things; he was difficult to steer. At the time of transition to elementary school, the school ordered developmental evaluation tests, which were done by the school guidance centre. Because of his low scoring on static test reports, the school did not want to let him go to a mainstream primary school and they referred him to a special education school, as is habitually done in Belgium. Results of static testing are shown in table 9…

Age	• **Psychometric test results**	• **Recommendations**
4	• Reynell language tests and SON IQ tests : delay 2 years (IQ	• none
5	• WISC-R static cognitive tests delay 2 years; conclusion "low concentration; behavioral difficulties, difficult cooperation, too much withdrawal, language gap"	• referral to special school
10	• WISC-R + autism evaluation scale ; he scores in the autistic spectrum; cognitively in the mental retardation area (IQ 56)	• referring to special school

Table 9. Static test results at different ages of a boy with Down syndrome (case 3: Willy)

During a first dynamic assessment at the age of five years, it became apparent that the behavioral, intellectual and language deficiencies were susceptible to change and learning. Instead of using a standardized battery of tests – as in other forms of dynamic assessment for older children –"normal" kindergarten games were used in order to establish a working relationship. This method of dynamic assessment is more based on "participatory observation". With mediation he was able to perform way above his "normal" level of functioning. A strong mediation of regulation of behavior was needed, very directive. On the other hand a clear intentionality ("I want you to do this" "We are now going to do this"), starting with something which would surely evoke his curiosity and motivation, but then "taking over" and not just allowing him to do as he pleased. He could be taught to pronounce better and to use longer sentences. He pronounced better when he was allowed to "read" the words. He could be taught to recognize words

globally. He appeared to have a very good long term visual memory, both for spatial configuration as for word recognition and pictures. He loved music, which could be used as a motivation trigger. He had a very good learning capacity through imitation. All these were indicators of a good learning potential, which were not visible upon psychometric testing (Table 10). The results of assessment led to the formulation of an educational intervention plan, consisting of: an individual academic plan with an intensive global word reading program according to Buckley's approach (Buckley & Bird., 2003), intensified mediated learning experience with teaching of basic concepts according to Nyborg's concept teaching model (Hansen et al., 2002)

Age	Test of dynamic assessment used	Mediation needed	Results	Recommendations
5 y	Participatory observation with mediated play with educative materials: • language cards : naming daily objects • global word reading • categorization and seriation of 5x6 colored blocks • counting • puzzle with human figure • classification according to color and size of a tower, then other various concrete objects	• intentionality: tell him the goal of the activity ("I want you to do this" "We are now going to do this") evoke his curiosity and motivation • meaning: choosing activities which have meaning for him (e.g. a Mickey Mouse puzzle • mediation or regulation of behavior: be very directive; don't let him dictate all the time the activities; start with something he likes, then introduce something else; take turns; stop trial and error, stop impulsivity, sit straight, look before beginning; make physical contact • mediation of feelings of competence: congratulate+ explain what was good and why • mediation of challenge: not too easy things • mediated repetition: repeat 100 times	• Same cognitive, behavioral & language deficits found as other tests • Short attention span • Gives up easily • he is open to learning, under the condition of good mediation • has a very good Long Term Memory, can be taught concepts • good imitation, especially in group • good reaction to music	1. Learning environment at school: start inclusive primary school: • let him participate in class as much as possible • a "strong" teacher, a very good regulator of behavior with consequent behavior • regular class is good because his learning through imitating and better regulation in group • at home: organize more assistance with volunteers (brothers, parents, students) 2. academic program (IEP: individual education plan) • start reading with global word reading method • use his love for music to teach numbers • start writing 3. Mediation: • use visual supports to reinforce learning (e.g. images, word cards) • very intensive, close mediation • when giving instructions: keep it short and 1 at the time; use visual support • see mediation in assessment • mediation of speech: make him focus and look; make him repeat a short sentence; stress first and last consonants • mediated sharing: do things together until he reaches some competence
6 y	• Participatory observation: • categorization with numbers and shapes • seriation • Drawing a human figure • Color cards: adjectives and propositions • Educative CD with numbers • Human figure puzzle • memory	• mediated focusing • clapping games to regulate attention • mediated repetition of speech in 2-3 word sentences • teach concepts of space: up, down, left, right • teach concept of number, shape, color • regulate muscular tension in drawing, by facilitating wrist ; teach direction, start and stop • always work with visual model close by • make him point at the right answer • make him compare • teach concepts: small, big, smaller, bigger • take turns • be very insisting	• despite big cognitive difficulties (lack of focusing, lack of concepts, lack of comparative behavior) and attention span shortness (1/2 h) , signs of modifiability: retention of learnt concepts, motivation to learn, less repetition needed, able to understand relationships	• continue to use games as a preferential mode of teaching • intensify teaching of global word reading • provide classroom assistance during at least 2 h a day • use all kinds of educative games, including computer • provide extra mediated learning at home during 1-2 h a day • teach basic shapes, colors, numbers, time; using Nyborg's concept teaching model • teach systematic counting, holding his finger • use children's songs to teach counting • mediated drawing (holding hand); connecting dots to make a simple figure according to a model

10 y	• Context assessment: home situation, teacher, school mates • Autism screening scale • Dynamic assessment battery of LPAD- basic (Feuerstein): 1. Visual organization & planning: Organization of dots (Feuerstein-Rey) 2. Abstract thinking: Raven's colored matrices (RCPM) 3. Visual memory: associative part/whole functional reduction test 4. Spatial memory: Cognitive Modifiability Battery Tzuriel subtest ME memory (Tzuriel) 5. Visual Transport (Feuerstein) 6. Visual Part/whole relationships 7. Categorization, Inclusion & exclusion	• Mediate to copy a "model"; • Mediated analysis of characteristics • Concept teaching of shapes • Regulation: connecting dots; stop, look at the goal • Mediating systematic search and work • Focusing and comparison distances & orientation • Project relationships (visual transport) • Asking precision • Strong positive feedback • Very intensive directive mediation, sometimes almost "forcing" him to go over the threshold • Make him point at the right answer • "zero distance" mediation = sitting close, arm over shoulder, guiding his hand • repeating 10x	• autistic symptoms are contextual and temporary • serious cognitive deficiencies (difficulty in projecting relationships ; lack of concepts of shape & space; lack of focusing; unsystematic search; lack of comparison) can be overcome • difficulties in output: he did not point; motor dyspraxia (drawing, writing) can be improved with mediation • abstract thinking is possible: RCPM score from 11/36 to 30/36 after mediation • bad short term memory (STM) can be improved by teaching organization and 10x repetition	• behavioral mediation: give him enough adapted, motivating tasks so he has something to do; don't let him withdraw in class; give him the message that he is welcome, that he belongs to the group; let him participate • start a cognitive activation program: there is certainly a need to insert more general cognitive activation lessons with a program such as Feuerstein's Instrumental Enrichment (Basic version) and Nyborg's concept teaching • teach mental operations: analogies, orientation, comparison & categorization, time relationships, instructions, seriation • classroom organization: let him participate more, let him have the feeling to participate, albeit a very small contribution

Table 10. Dynamic assessment of Willy, a boy with Down syndrome, at various ages

Thanks to this Individual Education Plan (IEP), "strong teachers" and intensive coaching by a team consisting of teacher, parents, learning coach and supervisor, he successfully went through first and second grade of elementary school. He learnt to read quite fluently, first with global reading, then with spelling; he learnt to write and make simple additions. Problems returned more explicitly in the third grade. His teacher complained that he became more withdrawn in class, that he showed signs of autistic behavior; that he was not able to work alone and she had to invest too much time in him; that he did not want to work and there was not enough help at school. School requested again a formal testing and did not want to let him go on in that school on the grounds of his autistic behavior.

Another comprehensive dynamic assessment was requested at the age of 10 years by the parents. First a contextual assessment was carried out. It was found that he teacher was rather insecure and did not have a good conception about inclusive education; most importantly she unconsciously communicated this negative message to Willy, who felt excluded. She gave him too much space to withdraw and not enough adapted tasks to do. She did not give him any mediation of feelings of competence. It was necessary to mediate the teacher how to mediate the child. Dynamic assessment also found out that at the basis of Willy's behavioral difficulties, there were underlying serious cognitive difficulties (table 10), which had not been addressed enough during previous years, but that these could be overcome by more intensive mediation. As a result, different recommendations were given: he was not labeled autistic and not referred to a special school, or to individual teaching outside the class group. Instead, a stronger mediation and resetting of goals was recommended. The next year, changing the teacher transformed the child. This teacher gave him and the rest of the class a message that "he is enriching our class", he looked for adapted tasks. He had the same amount of help as the previous years, but this time it worked. Willy regained his motivation to learn and performed much better.

Discussion

These children come from three different countries, with different policies as to inclusion and education of their children with disabili-

ties. The first boy, Michael, went to an inclusive school, because in Italy all schools are inclusive since the 1977 Disability Act. Hence, in Italy, the admission to a mainstream school is not dependent on test results, as it is for other countries such as the Netherlands and Belgium. However, educational planning, also in Italy, is based on tests. Most educational evaluation in Italy is either psychoanalytic or psychometric. Neither of them gives a comprehensive view of the difficulties nor modifiability, and neither gives adequate information what to do to realize this modifiability.

A first characteristic of dynamic assessment is that it gives an in-depth view of the *modifiability of cognitive functioning*, or more exactly: cognitive processing. It probes into the "why" a child does not learn adequately, does not get to the required answer. Then dynamic assessment tries to find out how the child can come to a correct answer, by giving the child more mediation. Digging into the basic cognitive processing of information by the child, gives interesting transversal information, how the child could function, given the proper conditions of mediated learning and context.

A second characteristic is that dynamic assessment has an eye for the *learning context* and interaction. "Classic" psychometric evaluation is not contextual. Michael's first school was "a disaster", despite its inclusive character, despite the presence of a support teacher and of a privately engaged speech therapist. Socially and academically he lagged behind. The middle school appeared to be better. The conditions were the same, but the people differed. Similarly, in Harry's and Willy's case it was found out that autistic behavior was highly contextual and not only a characteristic proper to the child. Mediating the teacher and environment – or in the occurring case, changing the school or teacher – made the autistic "symptoms" disappear or greatly reduce.

Dynamic assessment also *evaluates the child's learning disposition*, which contains many motivational and contextual elements. Whether a child learns of not has many non-intellective factors, such as self-regulation, feelings of competence, reaction to challenge, criticism, need for mastery, need for individuality, etc. Those are not evaluated in classic psychometric testing.

Fourthly, dynamic assessment is *highly interactive*. One needs to create a motivating learning situation. Contrary to testing, in dynamic

assessment the assessor is at the same time an educator. The learning the child will show depends on the quality of mediation given. This is the strength of the LPAD and at the same time its weakness. The kind and intensity of mediation during the assessment give clear indications of how to mediate the child in the subsequent educational intervention plan. But no conclusion can be permitted when the child does not perform.

In this way, LPAD may shift the educational perspective of the child. In all three cases, there has been a shift of perspective. In the first place, within the child. During the interaction, and through the mediational process, the child becomes aware of its potential and competence. That needs sometimes very intensive mediation. Then, if adequately communicated, also parents and teachers may *shift their views* on the child's potential. When they start seeing what the child is able to do, or possibly able to learn, they may start offering different things. E.g. teaching to read to Willy. This shift of view is essential in creating opportunities for learning. It is comparable to findings of sociological research described by the Chicago school of sociology in explaining social adaptation to novelty. They introduced the concept of the *definition of the situation*: how you define the situation influences your decisions (Thomas & Znaniecki, 1984). One could say that LPAD helps to define the situation otherwise, in essence to define intelligence as a modifiability. Thus it may profoundly change the life course of an individual and possibly of entire populations. There are a few examples mentioned in this issue, but earlier work with LPAD has shown its importance in reorienting schooling of at risk populations (Kozulin et al.,)

Limitations and challenges imposed by dynamic assessment

Introducing LPAD or dynamic assessment as a preferential mode of assessment in education, however, is not an easy endeavor. There are many risks and problems.

LPAD is time consuming and hence costly. However, this need not necessarily be a problem. Time in itself is not a problem for the child, because the LPAD is also at the same time learning and intervention, which benefits child, school and family. Time is also necessary to cre-

ate a good mediating relationship of reciprocity, in which the child feels self-confident enough to engage in the proposed activities. Time is also needed to observe changes.

LPAD is dependent on the quality of mediation and hence of the mediator. This inevitably is a subjective dimension. LPAD has been reproached for lack of objectivity. Indeed, in LPAD, there is a combination of objectivity and subjectivity. The subjective dimension consists of the examiner investing his own personality and mediator qualities. At the same time there is objectivity because one has to keep an eye on all changes and record them. This kind of subjectivity is different from the one in psychoanalysis or Rorschach tests– where it lies in the interpretation. In LPAD interpretation is fairly objective. Subjectivity lies in the intervention. Of course, *intervention may influence the subject* and create in itself already some meaningful changes. In LPAD this is on purpose. That need not necessarily be avoided or controlled, as it is usually the case in other forms of measurement. It is O.K. as long as one is (1) aware of one's influence of the intervention and (2) one records the amount and kind of intervention. This is analogous to measurement in quantum physics: there it is considered inevitable that the examiner influences measurement, but one has to record it and be aware of it. There should be no reason why quantum physics is considered scientific and LPAD should, for the same reason, be rejected as unscientific. The drawback is that in the case of negative results – if no or little changes become apparent after mediation – one cannot make a conclusion, because it can be due to lack of capacity or lack of adequate mediation. The problem may become one of *training*, that there are not a sufficient number of skilled LPAD examiners, or that training takes too long. This is sometimes reproached to LPAD, that it takes too much time to train the examiners. It is a skill to mediate. It can be learnt, but that takes time and experience, like any skill. But to be able to operate any complex instrument takes time. This is a generally accepted principle, e.g. one would not expect electron microscopists to be able to read their microscopes without proper training. It takes time to get to know the instrument thoroughly and to learn to see what you can see. In LPAD the mediator has to learn to observe small changes.

Results are not necessarily reproducible, because every individual reacts in different ways. LPAD is a relational instrument. The fact that this may not create consistent and uniformly reproducible results is

not a reason to discard LPAD as unscientific either. There is an analogy with the behavior of complex open systems, which is characteristically *indeterministic* (Prigogine & Stengers, 1984). A relation between mediator (examiner) and learner is an example of a complex open system. The mediator has to be aware that his mediational efforts may not systematically produce the same results and he does not need to deplore it: it is a property of the system. This might create considerable tension between indeterministic character of LPAD and the rather deterministic nature of the school system which needs to know in advance how many speech therapy hours, occupation therapy, special needs teachers, etc. are going to be needed. The recommendations in the LPAD report can give indications.

The LPAD is not standardized, contrary to psychometric testing, neither in the procedure, nor in the scoring. There have been attempts to standardize dynamic assessment, in order to control for learning (Hamers, …). Feuerstein has criticized this way of standardizing, because dynamic assessment's primary goal is to demonstrate change and learning and this by definition has to be flexible. Standardization is for population study purposes, not for educational and clinical intervention. There are procedures in LPAD, but they are flexible. Lack of standardization need not be a major problem when the goal is to observe behavioral changes. In ethology this is accepted a scientific procedure, where observation and recording are considered of utmost importance. LPAD is similar to ethological observation. Some of the procedures in the LPAD, e.g. the Raven's matrices and Rey's complex figure, use tests that have been standardized by others and hence can boost on reliability, but other tests aren't. Lack of standardization, e.g. possible low reliability, may create a problem with interpretation of changes. If the tool itself is not reliable in the sense that results may fluctuate spontaneously without any mediation, then it is difficult to ascertain what comes from mediation and what from spontaneous fluctuation. This can be overcome by doing research on standardization, not so much for standardizing the LPAD test in itself, but to find out about the reliability of the tool.

The LPAD is more a qualitative instrument than a quantitative. Is it possible to quantitize? The answer is positive, but the question remains: what's the purpose of quantifying? There are quantitative elements in the LPAD, e.g. scoring results pre and post mediation. The

difference between post- and pretest give an idea of the individual's modifiability, if one would be able to subtract a sheer memory effect. The LPAD would benefit with some form of operationalisation, also of kind and intensity of mediation. There need to be a lot of research done.

There is a problem with the communication of results. There are no standard ways of reporting and there can be no short ways. Written reports are the most commonly applied ways. What to report? Since the purpose is to record learning and change on four domains (cognitive functions, operations, motivational aspects and learning efficiency), the report necessarily is going to be lengthy. One should describe the actual independent functioning on these four domains, then describe the kind and amount of mediation given, then report the quantitative and qualitative changes observed and then the interpretation. Since reports can seriously change a person's educational career (especially reports stressing the absence of capacity), the way reports are formulated is extremely important. This is why reports should be extensive and also communicated orally to all parties concerned: child, family and school, possibly containing images demonstrating changes.

Finally, there is a risk over estimating the child's potential and thus creating "smoke screens" and false hope. A mediator might see what he wants to see, where in fact there is little independent functioning. A way to overcome this risk to use multiple variations in instruments, to spread the assessment process over time, and to corroborate data by using different mediators.

Conclusion

The examples above have shown that LPAD is able to visualize modifiability of cognitive functions and learning disposition (non-intellective factors of learning), that these can be enhanced and how this can be done: through mediated learning. This may lead to a shift in perspective within the child's self-perception, as well as in parents and teachers, leading to significant changes in the educational career and future lives. Its limits lie in that LPAD remains a complex, time-consuming, interactive procedure, dependent on the skill of the mediator and quality of mediation. Does it mean that LPAD can replace psychometric testing in school psychology?

The fundamental problem with IQ testing is that it is often abused. Despite many statistical correlations which have been shown between IQ and school results, IQ cannot give an answer to the question why a child does not learn and what should be done to make a child learn. It may even become a dangerous weapon for exclusion: when children are tested in a classical way, children with learning difficulties are always losers: their self-esteem is lowered because of low position in a ranking order; they receive less esteem from society which considers them as intellectually inferior; labels and test results negatively influence educational expectations; hence low performing children tend to be offered less chances in education and later tend to be excluded from mainstream society. Thus, classic testing perpetuates and increases educational inequalities of chances.

However, when the question is "where the child's independent cognitive functioning stands in comparison to his peers", IQ may remain an interesting tool to rank the child and have a quick idea of the severity of cognitive difficulties. IQ therefore should not be abandoned. However, IQ should be abandoned as an orientation tool.

The question whether or not a child is able to go to a mainstream school cannot be answered by any tests, because that question needs a contextual answer. By definition, inclusive schooling is not child-contingent, but has to do with adequate curriculum development (Salamanca statement)

Dynamic assessment seems to be a valuable alternative because it departs from a radically salutogenic point of view: what are the individual's strengths to build on, what are his/her good points, how can we develop potential? Further research needs to be done on test validity and reliability and to construct norms for comparison.

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USEFULNESS OF THE APPLICATION OF COGNITIVE FUNCTIONS SCALE WITH YOUNG CHILDREN FROM THE NETHERLANDS.

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Abstract: This article describes the results of a study using the Application of Cognitive Functions Scale (ACFS: Lidz & Jepsen, 1997; 2000) with a sample of 29 Dutch children between the ages of five and six years. The ACFS is a curriculum-based dynamic assessment for use with young children. Prior to this study, the ACFS had been used only with children in the US. This study investigated the usefulness of this procedure with young children in the Netherlands, specifically looking at the relationship of the subscales and behavior ratings with language and arithmetic, as well as issues of construct validity such as pretest to posttest gains. The results support the utility of the ACFS with this population.

Introduction

Dynamic assessment (DA), as a category that includes a variety of interactive approaches to assessment, has come a long way since its roots in the early and mid twentieth century (see for reviews: Guthke & Wiedl, 1006; Hamers, Sijtsma, & Ruiijssenaars, 1993; Haywood & Tzuriel, 1992; Lidz, 1987; Lidz & Elliott, 2000; Sternberg & Grigorenko, 2002; and van der Aalsvoort, Resing & Ruijssenaars, 2000). Perhaps even more so than for standardized approaches, research and development regarding dynamic assessment procedures have become an international enterprise, with procedures now developed for use with individuals (and groups of individuals) of a wide variety of ages and characteristics.

The major catalysts for development and dissemination of DA procedures have been the work of Guthke and his students (e.g., 2000) in Germany, and Feuerstein and his associates (Feuerstein, Rand, & Hoffman, 1979) in Israel. Both groups have focused primarily on primary and secondary school students, as well as young adults. Use of DA with younger populations has been rapidly developing (e.g., Kahn,

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2000; Lidz, 2000; Tzuriel, 2001). One of the approaches designed for use with very young children is the Application of Cognitive Functions Scale (ACFS; Lidz & Jepsen, 2000), has been developed and researched primarily in the United States. Because it can never be assumed that a procedure designed within one cultural setting can be usefully applied with children from other cultural backgrounds, research investigating such cross-cultural applications is necessary.

This article describes a research study conducted in The Netherlands that investigates the use of the ACFS with kindergarten level children in a regular education program. The study looks at the psychometric properties of the ACFS in relation to this population, comparing results with studies involving children in the US. The overriding question is: is the ACFS an appropriate procedure for use with young Dutch children?

Current Study

Assessment that reflects specific curriculum objectives has become increasingly advocated to promote a close relationship between assessment and intervention. However, use of actual curriculum content for assessment of degree of content mastery is most appropriately a function of classroom teachers or of educational evaluators. Diagnosticians such as school psychologists (e.g. US) or educational psychologists (e.g., Netherlands, U.K.) need to find ways to remain close to, yet move beyond and below, the content demands of a specific curriculum to address issues that result in referral of children who are not successful learners.

Diagnosticians need to go beyond what the child currently knows, to understand how the child learns, as well as to determine obstructions to the child's successful learning. Combining curriculum-based and process-based approaches within a dynamic assessment model has been proposed by the first author as the optimal approach to assessment (Lidz, 1991). Using operationalizations of 'learning behavior' while interacting during DA has been a major topic by the second author (Van der Aalsvoort, 1997; Van der Aalsvoort & Lidz, 2002). Addressing cognitive processes that underlie specific curriculum objectives allows the diagnostician to probe deeply into the nature of the child's learning approaches and areas of challenge. Remaining close to

the curriculum increases the relevance of the resulting recommendations for the instructional setting.

The Application of Cognitive Functions Scale (ACFS: Lidz & Jepsen, 1997; 2000) has been designed as a curriculum-based dynamic assessment for use with children between the ages of three through five years [also appropriate for individuals with disabilities of much older ages]. The ACFS is a diagnostic tool for use by psychologists, and educational diagnosticians; it may also be found useful by speech / language pathologists. The ACFS includes six subscales (four core and two supplementary) that represent learning processes that are typically required for success in most American preschool programs. The ACFS yields scores that indicate the degree to which the child has mastered each of the tasks, as well as the child's responsiveness to intervention. Behavior ratings describe qualitative aspects of the child's interaction with the materials and the assessor. The behavior rating descriptors are the same across the six tasks.

The ACFS is to some extent atheoretical, and in other ways, grounded in contemporary models of cognitive development. The content, represented in the choice of processes, tasks, interventions, is largely pragmatic, and responds to the question: what is it that children need to be able to do to succeed with typical academic and social expectations of school? This informs the curriculum-based aspect of the procedure. How this question is answered is more theory-based, and grounded in the works of Vygotsky, Feuerstein, and other researchers in the area of cognitive development and, particularly, of metacognitive functioning. This informs the test administration design, scoring, and interpretation of results. The ACFS is not a test of intelligence. How children perform on the procedure is of course influenced by whatever we agree that intelligence is, but conclusions about a child's performance on the measure should not be framed in terms of inferences about the child's intelligence. This particularly applies to the concept of modifiability. That is, there is no necessary one to one relationship between intelligence and modifiability. In the authors' opinion, learning ability / modifiability / responsiveness to experience needs to be incorporated into any definition of intelligence.

Using a dynamic format typically involves interjecting an intervention between the standardized administration of the pretest and posttest. The ACFS pretest and posttest of each subscale are the same or

close variations on the same task, and the instructions for administration of all tasks are standardized. The ACFS interventions for each task are semi-scripted and predetermined, in a compromise effort to impose a degree of standardization on the procedure for purposes of research, facilitation of interpretation, and ease of administration. Despite this preprogramming, the ACFS induces an instructional conversation between a learner and mediator so that the mediator, as assessor, experiences what it is like to work with the child-as-learner, and the child demonstrates, in a comfortable way, areas of competence and need.

The interventions reflect current research literature describing effective instructional approaches for the processes involved in the task. The materials used for the intervention are different from those used for the pretests and posttests. The interventions teach to the processes, principles, and strategies underlying the tasks that relate to successful performance, without utilizing the actual test items themselves.

A brief description of the subscales and their interventions is as follows:

Classification (Core): The child is shown 36 wooden blocks of mixed attributes and, following introductory comments, asked to "show me how you can make groups with these blocks." If they are successful, they are asked: "Show me another way that you can make different groups with these blocks."

Intervention: Pictures of shapes varying on attributes of color, shape, and size are placed in front of the child. The child is taught what to notice about the pieces as a basis for making groups. The assessor provides scaffolding as necessary to help the child make the groups.

Auditory Memory (Story Retelling)(Core): The child is read a short story and told to listen carefully and then tell it back to the assessor. This includes a delayed memory test following completion of Visual Memory.

Intervention: Abstract pieces are placed on a large felt mat (or, alternatively, magnetic pieces on a magnet board) and used to create a model for the elements in the story. The child "reads" the symbols to create visual images to facilitate retelling of the story.

Visual Memory(Core): A set of eight pictures of common objects (four animals and four transportation) is placed in random order in front of the child. The child first names the pictures then is told to try

to remember them, and then is asked how they will help themselves remember.

Intervention: With an alternate set of pictures (food and clothes), the child is taught to use memory strategies of rehearsal, chunking and verbal elaboration.

Sequential Pattern Completion (Core): Sets of sequential patterns made with abstract plastic shapes are placed in front of the child, with the last piece missing. The child must select the missing piece from a choice of two to three alternatives.

Intervention: The child is led through completion of a series of patterns, beginning with hand movements to creating drawn patterns with crayons. The child is taught to feel the "need" for completion through emphasizing the rhythm of the pattern, as well as to say the pattern that was drawn.

Perspective Taking (Supplemental): A simple line drawing of a child is placed in front of the child, who is asked to assume the role of teacher and teach the assessor how to draw this picture.

Intervention: Using an alternate picture, the assessor assumes the teaching role and models the behaviors desired for the child. A third alternate picture is used for posttest.

Verbal Planning (Supplemental): Following a brief introduction, the child is asked to tell how to prepare a familiar item of cooking (e.g., peanut butter and jelly sandwich).

Intervention: Using a set of sequential pictures of a boy waking up in the morning and getting dressed, the child is introduced to planning words (first, next, and last) and helped to verbalize the plan portrayed in the pictures.

The characteristics rated on the Behavior Observation Rating Scale by the assessor following the pretest and intervention portions of each subscale are: self-regulation, persistence, flexibility, frustration tolerance, motivation, interactivity, and responsivity (following intervention only).

The nature of information yielded by the ACFS is both quantitative and qualitative, but not normative. The quantitative scores (number of items and per cent of items correct) serve as indicators of level of mastery of the task and can not and should not be interpreted as age equivalents. The ACFS is primarily useful for its descriptive, qualitative information, as it provides six opportunities to interact with the child

with inherently interesting, age-appropriate, instruction-relevant tasks. Although numbers can be useful for the purposes of monitoring the child's learning over time, as well as for research, the greater value is its appropriateness for diagnostic exploration, allowing for error analysis, cross-task comparison, and description of how the child approaches the challenges and reacts to the assessor's interventions. Nevertheless, the quantitative information makes the procedure useful studies such as the one described in this article.

Several studies document the reliability and validity of the ACFS. Three studies focused on the issue of practice effects, each targeting different subscales of the ACFS (Bensoussan, 2002; Brooks, 1997; Malowitsky, 2001). Two of these studies involved children with typical development (Bensoussan, 2002; Malowitsky, 2001), and all of the studies included both an experimental group of children who received intervention between pretests and post tests and a control group of children who did not experience intervention between the pretests and post tests. The results from these three studies provide evidence that the gains made from pretest to post test for all but one of the subscales are unlikely to be attributable to practice effects. Only the Verbal Planning subscale showed a significant gain for the control group.

Construct validity studies by Shurin (1999) and Levy (1999) involved children with developmental delays. These data support the construct validity of all but one of the ACFS subscales, the exception being Visual Memory.

Shurin found no relationship between ACFS scores and standardized IQ scores, suggesting that the ACFS is assessing variables different from those tapped by IQ tests for these children with developmental delays.

The Levy (1999) study addressed the issue of discriminant validity, comparing the scores of children with developmental delays and those with typical development. These data provide supportive evidence of discriminant validity, but again question the validity of the Visual Memory subscale. Levy's study looked at the intratest reliability of the ACFS subscales, and found significant relationships between each subscale and the total score for four of the six. The two subscales that did not reach significance were Classification and Visual Memory.

Research regarding the Behavior Observation Rating Scale of the ACFS completed by Shurin (1999), Levy (1999), and Aranov (1999) sup-

port the intratest reliability of the rating scale. Aranov's (1999) results support the stability of the behaviors of the children across settings, as well as the validity of the ratings during the assessment in relation to the classroom and speech therapy situations.

Finally, the study using the ACFS with deaf students (Lidz, 2004) documents the validity and usefulness of the procedure with this population.

As we said above, we advocate promoting a close relationship between assessment and instruction (e.g., Elliott & Fuchs, 1997; Fuchs & Fuchs, 1996). However, use of actual curriculum content for assessment of degree of content mastery is most appropriately a function of classroom teachers or of educational evaluators. Combining curriculum-based and process-based approaches within a dynamic assessment model, as has been proposed by the first author as the optimal approach to diagnostic assessment (Lidz, 1991), is the aim of validation research on the ACFS and provides the focus for this study.

The study described in this article concerns determination of the validity of the ACFS, a procedure developed in the US and used primarily with American children, in relation to young children in the Netherlands. This study looks at the relationship between the results of the ACFS and measures of the children's emergent numerical and linguistic abilities. The two supplemental subscales were not included in this study, as these tests rely heavily on the use of language. The primary question for this study is: Is the ACFS a valid assessment technique for investigating learning potential with Dutch children attending regular primary school? We also investigate the sufficiency of the construct validity of the ACFS. Therefore, two norm-referenced tests that allow assessment of curriculum related performance of reading and arithmetic are included in the data collection. The Behavior Rating Scale embedded in the original ACFS was replaced by an alternative rating scale that had been used by the authors in an earlier study (Van der Aalsvoort & Lidz, 2002).

Participants

The children from the sample came from two regular primary schools in The Netherlands. There were 16 boys and 13 girls, for a total of 29 participants. The mean age range for boys was 65.8 months (SD =

5.22) and for girls, 65.9 months (SD = 4.39). The mean age did not differ between the schools and the sexes. The variables Preschool Experience and Dutch as First Language were also comparable between the schools and the sexes. Most of the children had completed one year of preschool, and Dutch was their first language. Socioeconomic status, however, differed markedly between the schools (M = 8.1; SD = 4.10; M = 4.8; SD = 2.46; p = .013). Therefore, all analyses were carried out by using SES as a covariate.

Methodology

| Design

The children were selected from the Grade 2 classes of their regular primary schools. Each child was administered the ACFS as well as a norm-referenced test of receptive vocabulary and emergent mathematics.

| Instruments

Receptive vocabulary

This was assessed by using a subscale of the Language Test for Children (Van Kuijk, 1996) a standardized achievement test. The subscale includes 96 items of four pictures per page. The child has to point to the correct picture after the assessor says a word that is related only to one of the pictures. The raw score is then compared to a norm table with scores that range from 1 (high) to 5 (low).

Mathematical Knowledge

This was assessed with the Ordering test (CITO) by Van Kuijk (1997). The standardized achievement test contains 42 items that require paper and pencil problem solving. The raw score is then compared to a norm table with scores that range from 1 (high) to 5 (low).

Response to Mediation of Students (Lidz, 1997)

Following completion of each portion of each subscale of the ACFS (that is, following pretest, intervention, and posttest), the assessor rates the students from 1 (poor) to 5 (high) on each of the following eight variables: Responsiveness of interaction with mediator, Self-regulation of attention and impulses, Affective quality of interaction with mediator, Communication related to shared activity, Comprehension of activity demands, Use of mediator as a resource, Reaction

to challenge, and Modifiability to interaction. Total scores range between 8 and 40.

Procedure

The children from the two schools were tested by their teachers as part of their master's thesis (Hersman & Uittenbogaard, 2004). The parents of all of the children from the two Grade 2 classes were asked for their signed consent. Next, information was gathered from all of the children regarding their experience in preschool prior to their entrance to primary school, the use of the Dutch language at home, and the occupational status of their parents. The second author translated the ACFS manual into Dutch in discussion with the first author in order to assure comparability of the items. Test materials were supplied by the first author, also to assure comparability. The second author trained the teacher-assessors using direct instruction and discussion of their videotaped trials. The children in the study were first administered the language and arithmetic tests individually. This was followed by individual administration of the four core subscales of the ACFS. The ACFS assessment was videotaped so that the scoring and behavior ratings could be checked for reliability. Each child was tested in the morning. The assessment took one hour per child.

Results

The primary questions for this study concerned the appropriateness of the ACFS for use with Dutch children, as well as issues of the construct validity of this procedure in relation to this population. To address these questions, we first compared the means for each of the core tests, since pretest to posttest gains are relevant to the construct validation of dynamic assessment. Furthermore, we looked at the means and standard deviations in relation to the maximum scores for each subscale as a source of information regarding the relevance of this procedure for this population. This information appears in Table 1.

	Pre	Post	p	Max Score
Classification	3.59 (1.48)	4.76 (1.92)	.003	12
Auditory Memory	3.48 (1.88)	6.55 (2.84)	.000	17
Visual Memory	5.97 (1.24)	6.52 (1.55)	.069	12
Pattern Compl.	9.55(5.50)	11.31 (4.64)	.002	18

Table 1. Mean Differences between ACFS Subscales (N= 29)

Table 1 documents significant pretest to posttest gains for three of the four subscales, with Visual Memory showing a gain that does not quite reach significance. Comparison of the means and standard deviations with the maximum scores shows that the maximum scores were not reached by the participants for any of the subscales.

To address the next validity issue, we looked at the relationships between the ACFS subscales and tests of language and arithmetic. We anticipated that there would be stronger relationships between the subscales of Classification and Pattern Completion and arithmetic and between Auditory Memory (story retelling) and Language. We did not have a specific hypothesis with regard to Visual Memory. These results appear in Tables 2 and 3.

	r		p	
	Pre	**Post**	**Pre**	**Post**
Classification	.55	.14	.002	NS
Auditory Memory	.06	.39	NS	.04
Visual Memory	.28	.33	NS	NS
Pattern Compl.	.24	.43	NS	.02

Table 2. Pearson Correlations between ACFS Subscales and Scores on Arithmetic Test (N = 29)

	r		p	
	Pre	**Post**	**Pre**	**Post**
Classification	.57	.37	.001	NS
Auditory memory	.08	.35	NS	.06
Visual memory	.35	.05	.03	NS
Pattern Compl.	.34	.44	.07	.02

Table 3. Pearson Correlations between ACFS subscales and Scores on Receptive Language Test (N = 29)

Table 2 shows that Classification pretest and Auditory Memory and Pattern Completion posttests are significantly related to Arithmetic scores. Table 3 shows that Classification pretest and posttest, Auditory Memory posttest, and Pattern Completion posttest are significantly related to receptive language scores. In the case of Language, both pretests and posttests from Classification showed significant relationships; however, the pretest showed a stronger relationship. Visual Memory showed no significant relationships with Arithmetic, but the pretest of Visual Memory showed a non significant tendency toward a relationship with Language. In the case of both Auditory Memory and Pattern Completion, the posttests show significant relationships with both arithmetic and language. In the case of Classification, the pretest shows significant relationships with both arithmetic and language, although there is also a significant relationship between Classification posttest and language, though somewhat weaker than the pretest.

Our next question concerned the relationships between the behavior ratings during the course of ACFS subscales and the performance of the activities of the ACFS subscales and achievement scores. These results appear in Table 4.

Classification Pre	.38
Classification Post	-.32
Audotiry Memory	.13
Auditory Memory Post	.49
Vizuális memória pre-	-.32
Vizuális memória poszt-	.05
Pattern Completion Pre	.65 (p = .02)
Pattern Completion Post	.68 (p = .01)
Behavior/Pattern Completion and **Arithmetic test score**	.56 (p = .05)
Language test score	.59 (p = .05)

Table 4. Pearson Correlations between Behavior Ratings and ACFS Subscales and Achievement Test Scores

Table 4 shows significant relationships between behavior ratings per ACFS subscale only for the Pattern Completion pretest and posttest**.** The relationship between behavior rating scores on mathematical knowledge is significant only for Behavior Ratings during the Pattern

Completion subscale. The relationship between behavior ratings is significant for Language only regarding Behavior Ratings during the Classification subscale. Although the correlation between Auditory Memory and the Behavior Ratings did not reach statistical significance, there is a notable increase in the relationship between this subscale and the Behavior Ratings from pretest to posttest. This is also the case for Visual Memory, although the correlation for posttest is very low.

Another aspect of addressing the validity of dynamic assessment is to look at the correlational relationship between the pretest and posttest scores. Pretest scores represent the traditional, standardized, one time administration of a test, whereas posttest scores reflect the pretest plus gains made following intervention. As suggested by the information presented in the introduction, these gains are unlikely to be attributable to practice effect except in the case of the Verbal Planning supplemental subscale, which was not included in this study. These results appear in Table 5.

	r	p
Classification	.39	.04
Auditory Memory	.48	.01
Auditory Memory Delayed	.35	.06
Visual Memory	.38	.04
Pattern Completion	.86	.00

Table 5. Pearson Correlations between ACFS Pretest and Posttest Scores (N=29)

Table 5 documents significant correlations between pretests and posttests for three of the four subscales (approaching significance in the case of the relationship between the Auditory Memory pretest and delayed posttest). However, with the exception of Pattern Completion, these relationships are very modest and account for a very small portion of the variance.

Since socioeconomic status was shown to be the only variable that related significantly to the initial performance levels of the participants in this study, we considered it relevant to look at the relationships between SES and the ACFS and achievement variables of this study. These are shown in Table 6. We chose to use ACFS gain scores to reflect responsiveness to intervention.

	r	p
Classification	.345	.066
Auditory Memory	-.214	.265
Visual Memory	-.002	.993
Pattern Completion	-.171	.375
Behavior (Classification)	-.535	.003
Behavior (Auditory Memory)	-.514	.004
Behavior (Visual Memory)	-.381	.042
Behavior (Pattern Completion)	-.387	.191
Language	-.628	.000
Arithmetic	-.547	.002

Table 6. Pearson Correlations between SES, and ACFS Gain Scores, total Behavior Rating scores during the course of administering each ACFS subscale, and achievement variables

Table 6 shows several interesting results. The relationship between the children's performance and their socioeconomic background is obvious in the results with respect to language and mathematics in that the higher the SES of the children, the higher the level of their achievement. The same accounts for behavior displayed. Although the relationships between the subscale scores and SES were not significant, the ratings of the behavior of the children during the course of administration of these subscales was significant for three of the four subscales.

Despite statistical issues concerning the use of gain scores, we nevertheless thought it relevant to consider the relationship between gain scores and the criterion variables of this study (Arithmetic and Language) as an albeit imperfect way of looking at the relationship of "learning potential" and achievement. These results appear on Table 7.

Gain Scores	Language	Arithmetic
Classification	.06	.29
Auditory Memory	.30	.35
Visual Memory	-.22	.10
Pattern Completion	.05	.24

Table 7. Correlations between ACFS Subscale Gain Scores and Language and Arithmetic Scores

Finally, we thought it relevant to consider these gain scores in relation to the Behavior Rating scores on the same subscales, as it makes intuitive sense for behavior during the course of learning to relate to the outcome of learning, in this case on the activity during which the rated behavior occurs. These results appear in Table 8.

		p
Classification	.15	
Auditory Memory	.39	<.05
Visual Memory	.49	<.05
Pattern Completion	.34	

Table 8. Correlations between ACFS Gain Scores and Behavior Ratings on the Same Subscale

The results in Table 8 show significant relationships between Behavior Ratings and gain scores for two of the four subscales: Auditory Memory and Visual Memory.

Discussion

This study, applying the ACFS with 29 regular education kindergarten children from two Dutch primary schools, documents the utility of this procedure with this population. The children made gains on all of the subscales, reaching significance on three of the four. They showed a gain on the fourth, Visual Memory, that did not quite reach significance. Furthermore, the means and standard deviations document that the subscales were within the zones of proximal development for these participants, as none of these reached the maximum scores for the subscales. This suggests that the age of 3 to 5 suggested by the developers of the ACFS can be expanded to at least the range of 6 or 7 for this population. Moreover, the findings from the behavior ratings suggest that the children felt comfortable during the course of the assessment, as all of the scores were at or above 3.

The construct validity of dynamic assessment is also addressed by the relative relationships of pretests and posttests to a criterion variable. In this study we looked at the relationships between ACFS pretests and posttests with both language and arithmetic. The superiority

of the posttest to pretest relationship was supported for Auditory Memory in relation to both language and arithmetic and for Pattern Completion in relation to language, but not for Classification or Visual Memory.

The strong relationship of the Auditory Memory posttest and Classification pretest with both Language and Arithmetic is contrary to our expectations and suggests an underlying common component for these domains for these young children. The very strong correlation of .75 between Language and Arithmetic supports this, and suggest underlying common factors of language and reasoning that warrant further investigation.

This study documents a relationship between the behavior ratings and the gain scores of the ACFS subscales only in the case of Auditory and Visual Memory. This may suggest that behavior during the course of learning tasks related to memory is of particular importance to success. Behavior during these types of activities may have the strongest consequences for attention and subsequent retention, whereas, other types of activities may not be quite so vulnerable to less optimal behavior. However, gain scores showed no relationships with achievement, suggesting that what the child knows at the end of instruction on related processes may be a more variable relating to academic competence rather than extent of the gap between pre and post instruction knowledge.

Moreover, the behavior ratings on Classification were strongly related to Language and the behavior ratings on Pattern Completion to Arithmetic. This makes sense, since both pretest and posttest scores on Classification were significantly related to Language, and posttest Pattern Completion scores were significantly related to Arithmetic. However, neither of these subscales was uniquely associated with either area of achievement, so it is not at all clear how to account for these associations with behavior ratings. They at least do not contradict the other data, although do not support initial expectations regarding a closer association between Classification and Arithmetic than with Language and provide further evidence for the likelihood of a common domain.

The significant but modest correlations between pretests and posttests, with the exception of Pattern Completion, document the weak ability of traditional or standardized approaches to assessment to pre-

dict the responsiveness of learners to intervention. This is typical of most studies involving dynamic assessment. Traditional assessment tends to be a weak indication of learning ability, that is, the child's ability to profit from instruction that targets the specific processes involved in the content and that is responsive to the needs of the learner. If ability to profit from experience is considered relevant to a definition of intelligence then such responsiveness should be included in its assessment.

The relationships between SES and behavior during administration of the ACFS subscales in the context of the significant relationships between SES and achievement are particularly interesting. This may highlight the importance of learning behaviors that are associated with successful academic competence and the nature of the disadvantage that may be associated with SES that has negative consequences for school learning.

These results generally support the utility of this procedure with young Dutch children. The limitations that exist appear to relate to the test per se rather than to any population differences, since results from this study parallel those carried out with children from the US. Since the Dutch children profited from the dynamic test procedure as expected, it can be claimed that, although there may be cultural differences between the populations of the US and The Netherlands, the aims of the test can be attained in both countries, and the information from the test can be interpreted similarly. In both cases the scores show no ceiling effects (with the possible exception of Visual Memory for US participants); therefore, the ACFS could be used with Dutch children similar to the population of this study up to age 7, the age when Dutch children enter Grade 3. Grade 3 in Holland is comparable to Grade 1 in the US, the time when formal reading and writing instruction begins.

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CULTURAL DIFFERENCE AND CULTURAL DEPRIVATION AS REFLECTED IN THE DYNAMIC ASSESSMENT OF ETHIOPIAN IMMIGRANT CHILDREN IN ISRAEL

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Abstract: The study of the dynamic assessment of Ethiopian children presents us with a unique opportunity to better understand the distinctions which we have formulated between the culturally deprived and the culturally different individual or group, often manifesting the same difficulties and the same levels of functioning (cf. Feuerstein, Feuerstein, Falik, and Rand, 2002). Cultural difference does not necessarily produce unavoidable difficulty in adaptation to new situations, which by definition the culturally different are confronted with. You are culturally different when you are confronted with new situations belonging to a different culture, a culture that you have not been previously exposed to. Our basic contention is that a culturally different individual is no less modifiable than one who is not culturally different, and thus highly accessible to the requirements for change and modifiability, which are required in order to become a part of the new culture. In contradistinction to the culturally different are the culturally deprived, who have great difficulties in adaptation and whose modifiability requires a very meaningful investment in order to produce the readiness and the possibility to become involved in a process of learning, in order to enable adaptation to new situations with which one may be confronted. Such difficulties may experienced by the culturally deprived even in the culture in which one is born and may be familiar with.

Keywords: cultural difference, cultural deprivation, conceptual differentiation, dynamic assessment

Introduction

The study of the dynamic assessment of Ethiopian children presents us with a unique opportunity to better understand the distinctions which we have formulated between the culturally deprived and the culturally different individual or group, often manifesting the same difficulties and the same levels of functioning (cf. Feuerstein, Feuerstein, Falik, and Rand, 2002). In various writings we have suggested that cultural difference does not necessarily produce unavoidable difficulty in adaptation to new situations which by definition the culturally different are confronted with. You are culturally different when

you are confronted with new situations belonging to a different culture, a culture which you have not been previously exposed to. Our basic contention is that a culturally different individual is no less modifiable than one who is not culturally different, and thus highly accessible to the requirements for change and modifiability which are required in order to become a part of the new culture. In contradistinction to the culturally different are the culturally deprived, who have great difficulties in adaptation and whose modifiability requires a very meaningful investment in order to produce the readiness and the possibility to become involved in a process of learning (the elements of the new, unfamiliar culture), in order to enable adaptation to new situations with which one may be confronted. Such difficulties may be experienced by the culturally deprived even in the culture in which one is born and may be familiar with.

Many sociologists and cultural anthropologists consider traditional societies as producing individuals who come to new cultural situations with some degree of resistance to change and as presenting difficulties in adaptation. This view tends to consider traditional cultures as restricting the acquisition of the perspectives and skills of the new culture. We contend that individuals in such cultures may well have an amenability to mediated learning experience, which can be used to adapt to the demands of the new culture. Hense the importance of differentiating between *cultural difference* and *cultural deprivation*.

Cultural Difference: Our basic hypothesis is that a cultural identity and tradition is formed in those individuals who have been exposed to their own culture--and that this exposure is what creates cultural difference. Culture can be transmitted in both mediational and non-mediational ways. But the human individual is much more flexible, adaptive, and disposed to hold on to and elaborate one's cultural experience in situations where the cultural has been mediated. In such instances, the individual who has been mediated is much more disposed and ready to become modified and adapted, even if this adaptation is in certain cases not consonant with one's tradition. This means that in many traditional societies of culturally different individuals, we may observe a readiness to adopt new cultural values, without giving up totally or even partially their own traditions.

Cultural Deprivation: This is contrasted with the culturally deprived. We define the culturally deprived individual as someone who,

for a variety of reasons, has not been offered the possibility to learn one's own culture. Such an individual is not culturally different--on the contrary, this person has not acquired the cultural tools and perspectives which will serve as a bridge between the culture in which one finds oneself and the culture from which one comes. For a long time, people interpreted the concept of cultural deprivation as the product of a depriving culture. This has created a great deal of justified confusion and resistance to this concept. We have made it clear in previous writings (cf. Feuerstein, et al., 1980) that by the concept of cultural deprivation we do not refer to the "culture." There is no culture that deprives its members, but there are individuals--whom for a variety of reasons--are deprived of their own culture. In such situations, there are no specific traditions which will be maintained, and therefore such an individual is presumably totally free to adopt and become adapted to the new situation. And yet this is not the case. What appears to be freedom is actually a lack of acquired structures of learning and responding, a lack of anchoring of one's experience into systems of thinking and behaving that *are* the characteristics of the acquired culture. Consequently they have nothing to refer to, no habits of mind or performance from which to reference as they attempt to integrate the elements of the new culture.

On the other hand, many of the culturally different are those who learn more easily and are ready to become affected by exposure to new cultural values, and thereby become more easily integrated into the new society, even though they continue to adhere to their traditions.

What brings support to this major contention is the study done by Lesser, Fifer and Clark (1967) who compared four cultural groups (Chinese, Jewish, African-American, and Puerto Rican) and found that those who belonged to a group which had a higher degree of cultural identity and cohesion were more ready adopt the values and levels of functioning in the new culture while at the same time continuing their own traditions--the Chinese and Jewish more so than the African-American and Puerto Rican groups in the study. However, the factor of socio-economic status (SES) was also determined to be a variable, in that for some groups the cognitive achievement (and resultant cultural identity) did not depend on SES (the Chinese and Jewish groups) but for others it was significant (for the poor Puerto Rican children we hypothesize that they did not experience MLE, but that upper SES chil-

dren presumably did).

And yet, cultural difference may be an impediment to certain developments in the individual, in particular if the immigration comes from a country which is technologically or educationally very different, not only in terms of language but also in terms of the educational and technological skills to which the individual was exposed. But these aspects of adaptation are components which the individual who has been exposed to the learning situations, which have had in them intensive modalities of mediated learning experience and cultural transmission has "learned how to learn." This creates the conditions whereby once confronted with new situations there is a readiness to benefit from the new learning opportunities presented and use them for better adaptation. Whereas the culturally deprived, who have not been exposed or able to accept mediated learning experience have not developed the necessary tools of learning which are needed, and consequently the possibilities to learn and adapt via the process of learning will be reduced. The readiness to modify oneself will be accordingly limited. This is to say that we believe that what renders the human being flexible, endowed with the plasticity necessary to modify oneself is to a large extent the product of mediated learning experience. Cultural transmission as the intergenerational form of mediation is one of the important sources of learning available to the individual. Once this learning takes place the individual will benefit from it whenever new situations are confronted which require adaptation.

Applications of the Conceptual Differentiation

Our work with this hypothesis has been directed to two levels. It has been applied on the level of the individual, where we could see that with a proper analysis of the circumstances of life, of interactions of children in their families, that the lack of mediated learning experience rendered the individual very resistant and lacking the disponability to learn and be modified. On the second level, we have observed larger groups of people. There we could see the great difference between groups which were culturally different by virtue of having been exposed to cultural transmission. This endowed them with a rich traditional mode of behavior, which was transmitted to them from generation to generation, becoming meaningful sources of modalities of be-

having, thinking, and other cultural and social phenomena. The other groups, who for a variety of reasons, did not experience this opportunity of learning were thus deprived of their own culture. Here we reiterate that when we refer to cultural deprivation we do not refer to a *culture* as depriving, but rather to individuals who for one or another reason are deprived of their culture. On the group level, we were able to show how those groups which by virtue of their strong adherence to their traditions came to Israel and were strongly and in certain cases extremely different from the environment of the dominant culture to which they had to become integrated. In Israel this refers mostly to people from eastern and western Europe. An excellent example is that of the Yemenite immigration. They were different in all respects--the way they dressed, their traditions, language, foods, music, dances, etc. Despite a very low level of technological development in the countries they came from, and despite the differences between them and the culture to which they had to adapt, they showed a considerable degree of modifiability. They rapidly learned the cultural codes of the country to which they had to become integrated. In spite of the fact that they continued the traditions of their own culture, their capacity to become part of the dominant culture was very meaningfully present. The Yemenites not only became adapted to the culture, but they became a leading factor in the structuring of the new Israeli society. They became leaders in many segments of that society, in forms of jewelry, clothing, foods, and the arts. And those from the dominant "western world" cultural came to look upon them as models to emulate and learn from.

The Ethiopian Immigration

The Ethiopian population, in its immigration to Israel, represented a unique opportunity to examine the hypothesis of the culturally different as being more ready and able to go beyond the barriers which their culture had imposed on them. In particular this meant the confronting of modern technologically oriented education, occupational activities, and modes of communication. To a very large extent, they were the most extremely different group that the Israeli society ever had to integrate. The first major wave of Ethiopians which came in the 1980's were preceded by 18-20 young men who were sent by the community and the Jewish Agency to Israel in order to prepare them to act

as teachers of Hebrew in the Jewish communities of Ethiopia. The first author had the opportunity to meet with this group and to take part in their education. This was a selected group of people who were considered able to become educators, not representative of those whom we would see during the mass migration. But even then we were able to see the great cognitive and educational differences between these people and the Israeli society, and we were amazed to see the ease and rapidity by which they were able to use the exposure to the new culture in order to modify themselves--in their styles of thinking, modes of acting and communicating--and to a certain degree their reaching out to a very different level of functioning than they initially had. Discussions which we had with some of them revealed the fact that the Ethiopian community being considered for immigration represented a very extreme case of cultural difference.

Levels of Functioning: This difference was first and foremost manifested by a total condition of pre-literacy, affecting almost 90 percent of the population. The inexistence of books, the limited exposure to literate communicational modalities, the almost total absence of pencils and paper, created a condition that was so pronounced that the children's visual-perceptual processes seemed to be quite different than one usually observed in small children exposed at early ages to books, pictures, etc. Yet this was positively contrasted with a highly developed proficiency in working with clay--using their hands to mold materials for sculpture. In this activity they showed a high degree of proficiency. Any other modes of interaction than oral transmission and auditory reception--the listening skills-were very different from those which were typical for children raised in the Israeli culture.

Psychologists who attempted to examine these with conventional psychometric tests found that the children were not only hampered and impaired in their work, but some of them acted literally as retarded--in the content and knowledge of their functioning, and in their response to the modalities of interaction. Individuals at the age of 15 or 16 often could not draw a proper square, diamond or triangle without assistance. They were thus initially considered by many of those who assessed them as mentally retarded and not capable of improving their functioning. And this had the effect of creating the impression that these children would not be amenable to being taught to, to acquire mathematical concepts, and to comprehend language which was not

formulated in the most concrete ways. Certainly on the basis of manifest skills measured by the psychometric indicators, and in the basic existent perceptual and motor skills, this conclusion may have been justified. However, such indicators do not-in and of themselves--address the effects of mediated learning experience on such levels of performance and propensity to be modified. Indeed, and with our efforts to stimulate awareness of the potential for MLE in the culturally different population, the question that was beginning to be asked by educators and those who were directing and orienting the education of these students, was to what extent can they, at this stage of their lives, be educated? Was it possible to determine a realistic level of their learning potential in spite of their manifest functioning on the conventional psychometric measures and their responses to the demands of the academic curriculum?

In contrast, the teachers who initially began to work with the Ethiopian children offered observations of these children which were more positive and optimistic. They expressed that these children had many skills which reflected an amenability to learn and be taught, and a very sensitive kind of social wisdom. This showed itself in the way they approached elderly persons, the way they approached one another, the way they asked permission for help, their ability to listen attentively and respectively, and the like. Teachers were excited by the high level of cooperativeness, attentiveness, and motivation to learn, in spite of their lack of access to literate communication and the classroom learning structures of the culture into which they were being absorbed. This clearly pointed to the existence of more development and integration, and was contrary to the perception of their being mentally retarded. But this contrast presented considerable difficulties, because their performance in tasks required by school showed a delay of 5, 6 and more years, not counting the illiteracy and to a certain degree what seemed to be a resistance to learning to read, and acquire other academically related skills. There was, at this time, some suspicion emerging that there might be some kind of learning disability in the area of visual decoding, capacity to use literate symbols and signs, and turn them into phonemic elements. Such a judgment might well be appropriate given an analysis of their previous lack of exposure to such elements and modalities in the culture from which they came. Whether it represented a "learning disability" as defined in the western world is highly

questionable.

Additional Social Disruption: To this picture must be added that the population experienced many traumas associated with their immigration--children and young adults came to Israel with many of their parents left behind, or dying on the trip, and experienced many other kinds of social disorganizational phenomena. Many of the children had to live in transit camps for extended periods of time prior to their immigration, experiencing a significant uprooting from their familiar environments. Given these disruptions in family and community experience, it is highly possible that some of these children could be described as becoming "culturally deprived" as a consequence of their experience.

Therefore, the critical question was to what extent would these children--functioning so low, and experiencing a variety of additional endangerments-be able to function in a way that would enable them to become educated, integrated into higher levels of schooling, and to what extent would the society perceive them to be able to function on an appropriate level for their eventual productive and contributive integration.

Initial Perspectives on Assessment: It was clear that any attempt to evaluate these individual's level of functioning by the use of conventional psychometric methods of evaluation would have very limited applicability. This is irrespective of the nature, language of assessment, or whether the tests were developmental, biological, or any other types of measures meant to establish a developmental level or neurophysiological. It was clear that this would lead to an underestimation of their capacities because the assessment would not reflect the structure of their cognitive processes, which were different from those of the normative groups that the instruments were based upon. For many of these individuals, if one chose to use such measures, one would have to conclude that the examinees were not accessible to the modalities of functioning required, and would perform as mentally retarded with various degree of intonation.

And indeed, many of the psychologists who attempted to assess them were presented with a state of conflict. They felt after trying a variety of tools and instruments that they did not really reach to the true capacities of the children, which were totally obscured by the cultural differences and the lack of readiness and tools to demonstrate the

types of functions which were looked for and usually found in their European and westernized peers. However, many psychologists continued to consider the available standard instruments as preferable (having an established validity and reliability), and the newer alternative methods (e.g., the LPAD and other mediationally oriented methodologies) as unscientific and unreliable. The dilemma was that to use the traditional tools led to the conclusion that these culturally different people were devoid of certain modes of functioning. The alternative point of view, slowly and painfully arrived at in many cases was that, because of the Ethiopian students' belonging to a given culture and ethnic group (implying a hereditary etiology-see below) there were critical functions which were not used or developed. The consequence of this unresolved dilemma was the identifying of 100's of children and youngsters for whom the conventional methods of many different types and approaches (e.g., Piagetian, Binet-Simon, non-verbal tests such as the Cattell, Bender-Gestalt, or the Human Figure Drawing) resulted in very low levels of functioning. This resulted in the tendency to refer these children to special education, and thus to doom them to a low level of expectations, and a very inadequate regimen of studies.

A First Alternative Response: At a certain point the senior author undertook the development of a project which would begin to counteract these views, and provide an alternative response. This was accomplished by assessing a first group of approximately 300 children and youth who were referred to Youth Aliyah. It was at a time when some of the leaders of the Ethiopian groups had started to become aware of the implications of the traditional approaches to assessment and placement (with our assistance), and began to create a movement to try to protect these children from the inadequate evaluation of their true capacities. A number of the leading figures whom we had met personally, fifteen years before the large mass of immigration, came to see the first author, and discussed with him the ways of fighting against this tendency of psychologists to declare these children as mentally retarded and place them in special settings (classrooms and institutions) for retarded populations. They started to ask us-both at Youth Aliyah and the Hadassah-WIZO-Canada Research Institute-in what ways could we help change the view which existed and protect these children from the outcomes of the conventional psychometric approaches.

Indeed, the first children we examined gave us a wonderful illustration of how a dynamic approach, with mediated learning experience, totally changed the image of a population which was on its way to becoming stereotypically doomed to a low level of functioning.

We were aware of the conclusions posed by Arthur Jensen's (1963; 1969) work on levels of intelligence, and saw this project as an opportunity to counteract his findings and implications. In this we refer to those who see intelligence as an inherited factor and therefore reflecting certain racial characteristics. At this point of time, in the early to mid-1980's, there was clearly a body of opinion among educators and psychologists reflecting these beliefs, which led to the conclusion that for some reasons this population has an inherited low IQ. And yet, those who were working with the population were becoming aware of, and somewhat uncomfortable, with the contrast which they were able to observe between non-academic and social behavior (implying a higher level of IQ functioning), on the one hand, and the examinees' performance on the static, conventional psychometric instruments which were using. This led to a first breakthrough--an initial, tentative acceptance of the possibility that the way by which these children were assessed, and the resultant IQ scores derived might not be valid. From this vantage point, was was being recognized was that the Ethiopian population was "at least" as potentially modifiable as other groups of culturally different individuals, and that there were jusifiable grounds for optimism.

We started to offer to many psychologists demonstrations of how dynamic assessment, using a procedure which was not contrained by the totally psychometrics assumptions and approach. The objective was to offer the possibility to see real transformations in the children assessed. With these and other similar efforts, teachers and others working with the students started to describe them as interested and efficient learners. Many of the teachers who were familiar with other culturally deprived children pointed out that the Ethiopian children indeed had a capacity to listen, to attend, and to use what they see and hear in a most efficient way, and in particular a real capacity to absorb on an auditory level despite their difficulties in learning to read. At this early stage, they were not able to use any of the decoding functions. However, whatever they were told they paid attention to, remembered and used in their further learning. In this way, an opposing view was

emerging--the Ethiopian students came to be seen by many teachers as having an incredible capacity to benefit from instruction to forge new learning outcomes. This was very consonant with our findings on the LPAD, and which were able to demonstrate.

The data which we will present in the following part of this paper confirmed the hypothesis that many of these culturally different children and youth have been exposed to processes of MLE in their own cultural experience, primarily as reflected in their response to stimuli in the auditory modality. Observations in the classroom context confirmed this, as students sat in their classroom in a state of positive anticipation, which enabled them to hear each word offered by the teacher. They were attentive and efficient in using whatever time was set to learn things-there was no need for discipline, to call for their attention, to ask them not to talk. The moment the teacher entered the room there was a silence which allowed the work to take place and enable the students to learn. The language gap presented some limitations in communication, but with time the students became extremely active in their own way, and made the teachers enthusiastic about them as students.

In the results we have obtained with these students, great changes occurred between pre-test and post-test levels of functioning. These results were evident from the group testing, and even more so when the assessment was individual. In the following section we will present the data on these children, and the types of changes produced by them in a variety of batteries of tests.

Application of the LPAD and FIE with New Immigrant Students

From its inception in the work of Feuerstein and his colleagues with new immigrant youth from Asia and North Africa (Feuerstein et al, 1979) the LPAD assessment approach has been successfully used with a variety of new immigrant and ethnic minority groups.

The first large scale application of this method with new immigrants from Ethiopia was undertaken in 1985-86 (see Kaniel et al, 1991). New immigrant adolescents arrived in Israel one year prior to the study and were studying in the boarding schools sponsored by the Youth Aliyah Department of the Jewish

	Raven pre	Raven post	Variations I	Variations II
Experimental	36	59	69	65
Control	39	42	27	21

[**Table 1.** Average performance in % for experimental and control groups in Raven Progressive Matrices pre- and post-test and learning tasks Variations I and II. (Adapted from Kaniel et al, p.195)]

Agency. Three hundred fourty new immigrant adolescents were examined using the group format of the LPAD battery. The initial level of the students' performance on such non-verbal and presumably culturally neutral tests as Raven's Standard Progressive Matrices was much lower than that of the Israeli norm (see Table 1). On average 15 year old new immigrant students performed on the level of 10 year old native Israelis. If only this static measure of the new immigrant students' intelligence were taken into account, many of them would have to be placed in special education frameworks. Fortunately, the LPAD procedure offers a different perspective. By introducing a learning phase based on the material of Set Variations I and II, the evaluation was transformed from static to dynamic. The Raven's Matrices pre-test scores were compared to the post-test scores obtained after the mediational intervention. The performance of students who received mediation was compared to a control group consisting of their peers who received the same tasks but without mediation.

The first important finding of this study was that mere familiarity with the test material does not help much in solving the tasks. The control group (N=57) students who solved the Raven's test twice improved their performance only by 3%. The second finding was that an exposure to the learning phase materials without mediation also has little effect on the students' performance. While the control group students, who worked without mediation, were able to solve only 21% of the Variations II tasks, the experimental group that received mediation was able to solve 65% of the same tasks. Finally, the results of the post-test indicated that the majority of new immigrant students became much closer in their performance to the Israeli age norm. Similar results were obtained in other tests of the LPAD battery.

One may conclude that the major problem facing new immigrants from Ethiopia is the incompatibility of their previous learning experi-

ences with requirements of the formal educational settings. The new immigrant students suffer not so much from a lack of knowledge, as from a lack of cognitive strategies that are usually presumed by the educational system as pre-existent in its students. As a result the new immigrant students demonstrate low performance both in the standard psychometric tests and in their independent work with learning tasks. At the same time, the LPAD procedure revealed that these students on average have a very good learning potential and are capable of quickly improving their performance when given a concentrated intervention based on the principles of mediated learning experience.

These findings were confirmed in a study of new immigrant adolescents who arrived in Israel from Ethiopia in 1991 (Kozulin, Kaufman, & Lurie, 1997). In this study four groups of new immigrant adolescents studying in different boarding schools of the Youth Aliyah Department of the Jewish Agency were examined using the LPAD battery. In addition, they received a year-long cognitive intervention in the form of the Instrumental Enrichment program (Feuerstein et al, 1980). The first significant finding of this study was that the initial cognitive performance of new immigrant adolescents was not only quantitatively but also qualitatively different from that of native Israeli students, both of the same and of a younger age. This result was obtained by comparing the new immigrant students' performance in different series of the Raven's Standard Progressive Matrices Test (see Figure 1). The LPAD procedure not only improved an absolute level of the immigrant students' performance but also changed the profile of students' responses that became much closer to that of their Israeli peers. Two conclusions can be drawn from these results. First, that the initial performance of the new immigrant students reflects their "cultural difference" rather than developmental delay, and second, that the LPAD is effective in changing the type of problem-solving strategies available to new immigrant students.

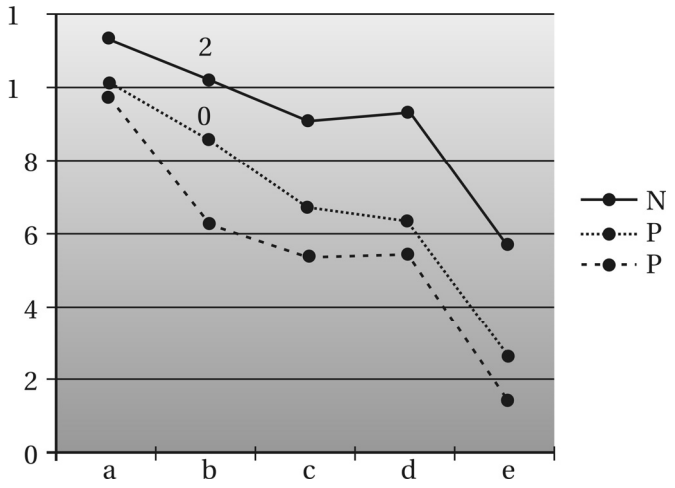


Figure 1. Raven's Progressive Matrices Scores in Series A-E;
13 year old new immigrant students, N=11.
(Adapted from Kozulin, Kaufman, Lurie, 1997)]

Another large-scale LPAD assessment of new immigrant children from Ethiopia was undertaken in 1997/98 at the request of the Jewish Agency. About 700 children who arrived in Israel six months earlier were evaluated using the individual and group versions of LPAD. The main goal of the intervention was to create conditions for the rapid integration of the new immigrant children into the Israeli educational system. In the context of this main goal the following sub-goals were formulated:

(1) The identification of the learning strategies and skills of the new immigrant children and on the basis of this to build a system for their transition to learning in the formal educational frameworks. Conveying this information to teachers and school administrators with the aim of preparing a tailor-made educational program suitable for this transition that would help students to acquire cognitive tools necessary for coping with the major changes experienced since their immigration to Israel.

(2) Reducing the risk of misdiagnosis and wrong educational placement of the new immigrant students. As members of a very different culture these students are often incapable of revealing their true learning potential during the standard psycho-educational assessment. As a result their abilities are misjudged and the educational track selected

for them is not the optimal one. Dynamic cognitive assessment (LPAD) allows us to separate the manifest level of functioning from the learning potential of the students and in this way to avoid the stigmatization of the students whose standard test scores are affected by their cultural differences.

(3) Identification of children with particularly high learning potential on the one hand, and those with specific difficulties, on the other, with an aim to facilitate their integration into regular classrooms by designing individual learning plans.

Group LPAD Assessment: was performed in groups of 15 students each. The group assessment creates conditions closer to that of regular classroom work. The mediation is provided to a group as a whole. It took three days to complete a group assessment. Approximately five hundred children were assessed using the group method.

Individual LPAD Assessment: was administered to children who were identified as having particular difficulties in the group format: those who failed at the group assessment, and with young children (1st - 3rd grade). The individual LPAD assessment includes up to 15 different instruments and requires several assessment sessions, approximately 12-15 hours per child. Approximately two hundred and twenty children were assessed by this method.

It was interesting to note the different reactions of the students to the assessment procedure. Initially they were wary and skeptical but quite soon we began hearing comments such as: "When is it my turn?" and "Teacher, when will it be my turn again?" This shift in the students' attitude was observed in both types of assessment. It attests to the significance of the learning process and the emergence of the feeling of competence in the immigrant children. That is why one answer to the question of how the new immigrant children benefit from the dynamic cognitive assessment is that the assessment itself produces significant changes in the children's performance, their attitude toward learning tasks, motivation, and a growing readiness to cope with new and unfamiliar situations and materials. These changes were the result of mediational intervention given during the assessment, which included conceptual and problem-solving strategies and principles geared to the individual needs of each student.

Results of the Group LPAD Assessment: New immigrant students

on average demonstrated remarkable ability to learn from mediation and from their own experience with tasks that they had never in their life seen before. For example, Figure 2 shows the change in the cognitive performance of 9-11 year old students (N=218) measured by the response to five Raven's Colored Matrices

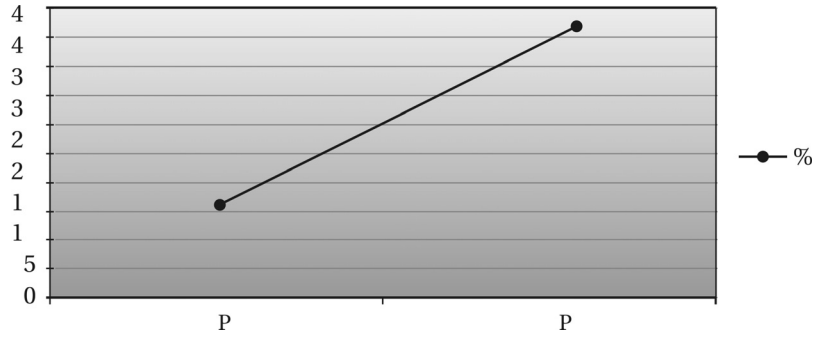
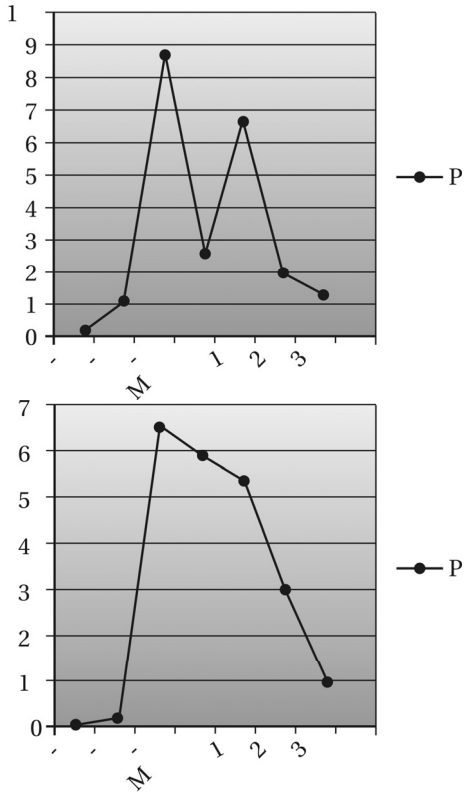


Figure 2. Pre- and post-mediation test scores of Raven's Colored Matrices in %. N=218]

Tasks that require analogical reasoning. The data demonstrates that students initially showed rather poor understanding of analogical relationships. They were, however, successful in learning from mediational practice and applied the newly acquired cognitive functions and operations during the post-test.

Figures 3a and 3b show the distribution of students according to their results received in the Raven Matrices test before and after mediational intervention. These figures provide a more accurate picture of the dynamics of student learning than average scores. For example, it becomes clear that before mediation the population of students included two different subgroups. A subgroup of students who performed at a level one or two standard deviations above the mean, and a subgroup of students who performed at a level of one standard deviation below the mean. There were not many "average" students whose results corresponded to the mean. After mediation the distribution of students changed considerably. Instead of two distinctive subgroups, one group revealed itself with an almost equal number of students performing at "average" level, and one standard deviation above and below the mean. This suggests that mediation led to greater uniformity of the students' performance. The initial dichotomy between

low and high performing students turned out to be illusory. It was enough for a "low performing" subgroup to receive mediation, then some of its members immediately achieved the status of average performers.



Figures 3a and 3b. Distribution of 9-11 year old students according to their pre- and post-test scores in standard deviations from the mean. N=218]

Figure 4 provides information about the change in the ability of 9-11 year old new immigrant students (N= 218) to copy, directly and from memory, a complex geometric figure. It is particularly important that the greater change took place in the reproduction from memory. This indicates that children succeeded in internalizing organizational and reproduction strategies taught to them and applied to them when asked to reproduce the figure from memory.

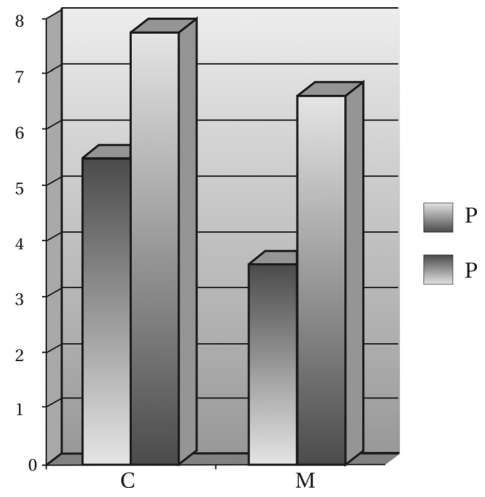


Figure 4. Complex Figure Drawing Test.
Copy and memory scores. N=218]

Results of the Individual LPAD Assessment: Individual learning potential assessment allows for a much more intensive mediation and more precise identification of the learning problems and needs of the child. Each individual assessment is a unique procedure attuned to specific strengths and difficulties of the individual child. Nevertheless, it is possible to identify certain common profiles of students and to prepare recommendations suitable for students of the same profile. The comparison of students' performance before and after mediation served as a theoretical basis for creating profiles. Thus students with Profile 1 demonstrated good or very good performance both pre- and post-mediation. Students with Profile 2 demonstrated fair to poor performance during the pre-tests, but improved significantly as a result of mediation and demonstrated very good results at the post-tests. Students with Profile 3 are similar to those of the previous group in that their pre-test scores were fair or poor, but unlike them the improvement in their performance was not so impressive and at the post-tests they achieved only fair to good results. Students with Profile 4 showed poor results both at the pre- and post-tests, which indicates that the amount of mediation was insufficient for producing changes in their performance. Finally, there is a theoretical provision for students with Profile 5 that is characterized by the regression from the good results at the pre-test to the fair or poor results at the post-test. Table 2 shows

the percentage of individually assessed students showing each of the profiles.

Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
28%	19%	49%	4%	0%

[**Table 2.** Percentage of individually assessed students belonging to each of the profiles]

LPAD and Long-term Cognitive Intervention: While it is crucial to distinguish between students manifest level of functioning and their learning potential, it is also important to ascertain whether the results of dynamic assessment are correlated with the effectiveness of a long-term cognitive intervention. The logic behind this question is as follows: the dynamic assessment procedure allows us to identify those cognitive capacities of the student that were undetected or non-existent under conditions of static, unaided performance. The "emergence" of these capacities during the LPAD is correlated with the student's ability to benefit from short-term mediation provided as a part of LPAD procedure. This ability is defined as a student's learning potential. It is logical to assume that students with higher learning potential--i.e. those who benefited from short-term learning intervention during LPAD--will also benefit more from a long-term cognitive intervention. Thus the students' learning potential rather than their static performance level should be used for planning the cognitive intervention.

This question was investigated in the context of the Concentrated Reinforcement Lessons (CoReL) project (Kozulin, 2002) conducted with nine to ten year old new immigrant children from Ethiopia. The children arrived in Israel three to three and a half years prior to the beginning of the study, thus their formal education started in Israel. The group was selected for LPAD assessment and intervention by the school administration that was concerned with their low achievement level. After three years of schooling the immigrant students were still lagging significantly behind their native Israeli peers in reading, math and general school skills.

The dynamic assessment was carried out at the beginning of school year using the LPAD in a group format. In addition, students received math and reading comprehension tests. The cognitive-educational in-

tervention called CoReL (Concentrated Reinforcement Lessons) lasted for nine months, and included five lessons per week of the Instrumental Enrichment (FIE) cognitive intervention program, five hours of intensive Hebrew, and five hours of intensive math. It is important to mention that though the FIE program contains a broad range of cognitive tasks, they are not similar in structure or response modality to the Raven Colored Matrices. All facets of intervention were infused with the principles of mediated learning experience that serves as a theoretical basis for the FIE program. The teachers' work was supervised by experienced FIE consultants. At the end of the school year the students were tested again using the Raven Colored Matrices as well as math and reading comprehension tasks. The results from Table 3 show that the students' pre-LPAD Raven Colored Matrices scores were significantly below the Israeli norm for this age (27.3; SD 5.7). The LPAD procedure, however, was effective in dramatically improving the

	Pre-LPAD	LPAD	Post CoReL
Mean	21.8	28.3 (*)	29.9 (*)
SD	6.1	5.9	4.1

[**Table 3.** Raven Colored Matrices scores (Max=36) of the primary school new immigrant students (N=35) at the pre-LPAD static test, LPAD and end of the year testing (Post CoRel). (*p <0.05)]

students' performance. In order to answer the question of whether the students' learning potential is a better predictor of the end of year performance results than the static Raven scores, a Pearson correlation was calculated between pre-LPAD and LPAD scores and the end of year scores respectively. While the static pre-LPAD scores were only weakly correlated with end of year results (r= 0.23), the LPAD scores were more strongly correlated (r = 0.54). One may thus conclude that the LPAD procedure is capable of creating/detecting those of the students' abilities that find their realization with the help of long-term cognitive intervention.

Summary and Conclusions

The learning potential and functional characteristics of the Ethiopian students whom we studied corroborated our theoretical predic-

tions, evidenced by the results of our assessment. They were clearly able to use whatever mediation was provided on given tasks. They were able to immediately apply them in efficient ways. The amount of mediation which was used at the beginning became reduced as the tasks continued and progressed. They made use of limited mediation to interact with continued and more complex activities. When we worked with these children, we had the feeling that "with one spoonful of sugar they were able to drink 50 cups of tea." That is, they were increasingly able to use in a most efficient way whatever was given to them.

The studies of Ethiopian modifiability have confirmed and corroborated one of the most important theses we have presented concerning the role of MLE in the cultural transmission of human modifiability. The Ethiopian students represent an extremely different cultural population. They came to us from a totally pre-literate society, and therefore had very little if any experience with the signs and symbols of literacy. The students had to overcome obstacles in order to perform the requirements of the western technologically oriented society to which they were being integrated, and acquire literate modalities of communication. So much was inexistent in their experience, unknown to them-both as modalities of thinking to be used in a conscious way, and with even less familiarity with the appropriate terminology and tools for reference and use (classification, categorization, etc.). These concepts may have existed in their repertoire of concrete behavior but they were not part of their functioning at the more abstract, internalized level of performance. However, the modifiability of these individuals manifested itself in the relative ease by which these functions were acquired, via MLE, and were then applied, used, and transferred with a high degree of insightful learning and application.

The MLE, at the beginning, had to be extremely intensive. In certain cases, we had to literally expose the individual to a variety of elementary experiences in order to create the understanding of the concepts needed to solve the problem, and to function appropriately. For example, we had to teach what was logical evidence, how to perceive systematically and educe relationships between various geometrical or pictorial presentations, which in certain cases were strange and unfamiliar. So the mediational process, which consisted of making the learner follow certain signs, had to be done in a very intensive way in

the beginning, but the results of the mediation showed a rapidity and efficiency, and a permanence of the acquisition. Things were not only remembered but integrated into their repertoire of functions and then applied to a variety of new elements which were presented.

If, for example, one looks at the results obtained in the Ravens test, which were extremely strange for this population, one can see in the first series of problems, gestalt types of perceptual activities which were extremely difficult for the examinees. The mediation had to work hard to make them look, analyze, compare, find differences and commonalties, and make them become aware of the types of relationships existing between the objects. Once this mediation was offered, with more mediation offered in the beginning of the tasks, the higher was the level of functioning as they progressed toward the much more complex tasks. The level of joy and motivation increased, as the students gained confidence and sought further exposure and instruction.

As we complete the writing of this paper, we are being requested by a variety educational authorities, in several countries, provide a rationale for the substituting of the dynamic procedure of the LPAD for conventional assessment methodology. There is a growing recognition of the distortions which conventional psychometric approaches create in the perception of many culturally different individuals, and the need to have a true reflection of the capacity and types of expectations which one may have for these populations.

Information and perspectives such as are provided in this paper offer convincing evidence of the justification and utilization of new paradigms of assessment and new frameworks of methodology to achieve these necessary and attainable goals.

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THE IMPACT OF DYNAMIC ASSESSMENT ON EDUCATIONAL SERVICES IN THE UNITED KINGDOM

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Abstract: This paper discusses the training and use of Dynamic Assessment by educational psychologists in the United Kingdom in recent years. Models of dynamic assessment which are being taught and their impact on educational services are discussed in relation to current educational psychology practises. Educational psychologists in the UK operate in a context of inclusive educational legislation and awareness of the need for culture fair assessment procedures in an increasingly multi ethnic society. With the growth of trans-European inclusion practises and European wide agreements on training, qualifications and applications of educational psychological services, models of training in Dynamic Assessment in the UK, may be relevant to other European countries, particularly those who, like the UK, have a national curriculum framework for setting standards in educational achievements during the school years. Future directions in which training and use of Dynamic Assessment might develop, are proposed as part of a wider use of cognitive education .

Introduction

Assessment of children's performance at different stages throughout the school years is a common feature of school systems everywhere. Typically, school testing is carried out in order to record levels of achievement in school subjects and test results are used frequently to compare children's performance to each other within the school and between schools, both locally and nationally. In the UK, there is a structure for educational assessment at 4 stages (known as Key Stages), which are implemented within the national curriculum from the ages of 3 – 16 years. Such testing at successive stages culminates in national examinations at age 16, and at advanced level, 18 years, which is required for University entrance.

Aside from these routine mainstream school assessments, other more specialised assessments are carried out when children are identified as having learning or developmental difficulties. Some of these assessments, which may include tests of intelligence or ability, can be administered by teaching staff, but administration and interpretation of some tests is restricted and can only be done by qualified psychologists. Amongst such restricted tests are some well known standardised

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intelligence tests, such as the Wechsler tests, which require specialist knowledge and training. The history of psychometric intelligence tests dates back to the early part of the twentieth century when such tests were developed and used mainly for classification purposes. Our focus here is on a different approach and use of educational psychological tests, that of Dynamic Assessment, which for many years was outside mainstream educational psychology practice.

Interest in Dynamic Assessment has grown in recent years (Lidz & Elliot,2000). DA is regarded not only as a relevant theoretical paradigm in today's multi ethnic and inclusive societies but also, in some models, providing practitioner tools which can be used by those responsible for examining and identifying the needs of learners of various ages and diversity of needs. The history of dynamic assessment began with the theoretical formulations of Vygotsky (1986,1978) whose identification of the importance of assessing and teaching in the child's zone of proximal development, laid the foundations for an interactive or dynamic type of assessment in which the psychologist purposefully intervenes in the testing procedure. The concept of active intervention, teaching the child the strategies needed for better task performance, opened up a field of experimentation and research when these concepts became better known in the western world. From the mid 1970's, in the USA and in a number of European countries (Lidz, 1987, Haywood & Tzuriel,1992), development of DA tests and techniques, based on Vygotskian concepts increased, but DA was not widely considered as a form of assessment that could be easily applied and used on a day to day basis. A second 'front' in the field of Dynamic Assessment developed from a different source, the work of Feuerstein (1987, 1997, 2002). Feuerstein was faced with the task of assessment and educational placement of refugee and traumatised adolescents. He developed his own dynamic assessment model, the Learning Potential Assessment Device (LPAD) (Feuerstein et al.,1995) intervening in test procedures in order to get beneath the manifest 'retarded' (cognitively deficient) performance of these learners. Despite different theoretical origins and different social needs that lay behind the development of Vygotsky's socio-cultural model and Feuerstein's response to cognitive deficiency, both approaches rejected the concept of the use of standardised intelligence tests as relevant ways of assessing the learning needs of individuals. Both approaches, not only survived beyond the

particular sociological and historical era in which they were developed but have shown themselves to be relevant in the present era,. One area of need which DA attempts to address, is assessing the cognitive processes of learners with very diverse cultural and linguistic experiences, a prevalent issue for so many European countries who are experiencing an influx of refugees, migrants and asylum seekers. The flow of populations between different countries, as political borders become less restrictive and economic changes, that are becoming continent- wide rather than strictly national, has influenced the need to re-assess learning and educational goals in mainstream education generally, not only for those children who cannot access standard curricular. There are major changes affecting the pattern of social, cultural and educational needs in Britain, similar to other European countries. For example in one London Borough, Haringey, more than 60 languages are spoken in just one small region of the city. Most well known psychometric educational psychological tests, are standardised according to an implied access to conventional educational materials, which are reflected in many of the activities of the sub tests. Typical examples are comprehension and word definitions subtests, in which a child with a different or poor access to the language and its cultural concepts would do much worse than typical children of that age group. It is no longer necessary in educational psychology services to make the point that scoring such tests psychometrically, cannot represent a child's true 'intelligence' when so much of the content of the tests depends on prior knowledge as well as prior access to typical test experiences.

Widespread social changes as well as psychologists' critical examination of the theoretical and practical components of some psychometric tests, has impacted on the training of psychologists in the United Kingdom in a number of ways. One such impact has been growing awareness and training in dynamic assessment for psychologists both in their initial professional training and as Continuous Professional Development (CPD) once psychologists are qualified and practising, in order to use dynamic assessment procedures as part of their regular assessment tools. Indications of the increasing interest in dynamic assessment in the UK, is that DA is introduced into every post graduate professional training course for educational psychologists and access to fuller dynamic assessment training is regularly available as CPD. The increasing availability of dynamic assessment

as Continuous Professional Development training is enabled by the compulsory requirement of forty hours of annual CPD by chartered psychologists. In the next section, some of the factors influencing the growing interest and use of DA are discussed and various models of DA training are outlined.

The Nature and Direction of Change

Britain along with its European neighbours is committed to policies of inclusion in educational, social and work environments. This affects a number of areas of policy and practice.

| Educational changes

An outcome of a governmental review of the UK national curriculum which took place in 2,000, was a move towards introducing more process orientated education within the national curriculum. More than 10 years of national curriculum has shown that content teaching, (subject teaching) alone does not necessarily raise standards sufficiently. (DfEE, 1997) The Government became interested in programmes which aim to improve thinking skills and thereby subject achievement (DfEE,1999) For example CASE, (Curriculum Acceleration in Science Education,) and CAME, Curriculum Acceleration in Mathematics Education,) (Adey & Shayer,1993) combine thinking skills with subject specific teaching, the outcomes of which can lead to raising standards in these subjects. There is a long standing tension between the view, on the one hand, that teaching thinking skills should be done as a teaching activity on its own, versus the view that teaching thinking skills must be done as curriculum immersion ie. within subject teaching. Adding to these seemingly opposite points of view, is the perception by many teachers, that the UK national curriculum over emphasises the teaching of prescriptive subject content to the detriment of teaching children more general processes of thinking and learning. Cognitive educationalists have for a long time regarded the teaching of thinking, metacognitive, transfer and generalisation skills as of at least equal importance as subject specific instruction, in order to better equip children to become flexible and adaptable learners (Haywood, 1997) Research has shown that the use of cognitively oriented cur-

ricular, which combine content *and* process teaching can lead to significant gains for disadvantaged children which impact on longer term academic performance (Cebe and Paour,2000, Brooks & Haywood, 2003).

| Toward a multi ethnic society

Changes in the population of Britain means that appreciation of cultural diversity, linguistic and social differences has to be reflected in the educational system. Failure to respond to multiple social and communal needs can result in children failing and dropping out of the system. An example of this is the current concern with the relative under achievements of Afro - Caribbean boys. Such concerns relate to the need to make educational provision relevant and meaningful to youngsters who are in danger of developing a negative subculture which leads to exclusion from mainstream education with its obvious long term implications.

| Changes in Educational Psychology Services

As a result of social changes and awareness by psychologists of the limitations of the use of standardised intelligence tests, a number of psychological services limit or even ban the use of such tests. There is also a move away from carrying out individual assessments toward an increase in the use of solution focused and consultation work.(Amjal &Rees 2001) Various forms of consultation now occupy a much bigger part of the work of the educational psychologist not necessarily because of large caseloads but because of the need to see the child in the wider context of the classroom, the school, and the family. That is, EP's are adopting a more ecological approach in investigating problems and providing advice to schools. Alternative assessment methods are being sought, amongst which Dynamic Assessment is of growing interest to psychologists.

Dynamic Assessment seems to offer the possibility of focussing attention on the child's learning needs and analysing underlying processing skills and cognitive abilities, rather than focussing on performance outcomes and scores. Dynamic Assessment deliberately removes a major feature of psychometric testing, enabling the assessor to intervene within the test itself, in order to teach the learner the strategies needed for more efficient task performance.

> Thus the psychologist is potentially able to facilitate learning behaviours in the child, identify efficient and deficient cognitive processes and indicate the type and amount of intervention needed to bring about desired changes from which the next steps of learning can be planned. This approach fits well to solution focussed and consultation practise (Wagner,2000).

Details of various dynamic assessment methods are well documented elsewhere (Lidz and Elliott,2000) Lidz,1987,1991,Tzuriel, 2001). We will focus now on how one form of dynamic assessment, the LPAD of Feuerstein and test batteries derived from the same theoretical model, are being taught and implemented in the UK.

DA training: where, when and how?

There are two stages at which Dynamic Assessment is introduced to psychologists.

The first stage is in initial training. Currently educational psychologists in the UK train at Masters degree level, having obtained a first degree in psychology and/or teaching. The present training for the Masters degree which is one year in the UK and 2 years in Scotland, has been considered inadequate for a long time. This system is about to change to a 3 year doctorate more similar to training in clinical psychology. The exact structure of the doctorate is still under discussion by the Government and the major psychologists' associations in the UK. The second stage of training is when they are practising as psychologists and must undertake regular Continuous Professional Development.

| Initial Training

Dynamic Assessment is introduced as part of every Masters Degree programme in the UK.. However, the content, quality and extent of such introduction is varied. There have been no national or international standards set to date to define what should constitute an introductory course in dynamic assessment. (International Test Commission, 2000) What is clear, is that unlike the brief initial training which psychologists receive in the use of psychometric tests, it is not possible to teach dynamic assessment so briefly, be-

cause the type of assessment, the extent of psychological knowledge and experience required cannot be adequately addressed within in a typical half day or one day exposure, which is often all the current training courses can offer because of time restrictions. Typical introduction which may include an outline of DA principles and exposure to one or two commonly known tests, cannot produce a professional who is ready to use and benefit from dynamic assessment in their day to day practise. This means that a newly qualified psychologist goes out to their first job, with some notion of dynamic assessment but with no depth of knowledge or training in analysis and interpretation of DA tests. Most test developers and trainers in the field of dynamic assessment are careful to emphasise that such brief introductions cannot be considered practitioner training. However, a useful purpose is served in creating awareness and interest which can then be followed up subsequently if the psychologists are interested and encouraged to do so in their local area psychology teams.

| DA as Continuous Professional Development

Lengthier Dynamic Assessment courses are generally taught to psychologists who are already qualified. Examples of CPD courses are Tzuriel (4 days) and Deutsch (8 days) delivered at Universities and various local psychology services. Presently under discussion is the possibility that much more extensive dynamic assessment training together with supervised clinical practise may become part of the new doctorate in educational psychology. Compared to various other types of psychology training, there is no standardisation of length of training and no agreed competence criteria. The extent to which psychologists are able to practise with confidence is not only contingent on the length and quality of initial training but also, most importantly, on the extent of the support for implementation once their initial training has been completed (Deutsch and Reynolds 2000) The author has been teaching dynamic assessment for several years at the Institute of Education, University of London to experienced psychologists as CPD, and in the present psychology training framework, considers this to be the optimal stage for studying dynamic assessment in depth. Psychologists come to the courses with experience in assessing a variety of children and are

able to relate their new dynamic assessment skills to analyse and advise on children's functioning in the context of the classroom and the school. The training itself is intensive and assumes substantial prior experience in assessment. It is unusual for psychological services to be able to set aside eight full days of training in any one methodology, yet, the frequency with which this is happening, is perhaps one indication of the level of interest in dynamic assessment as an alternative or complementary form of assessment. The importance of post training support and mentoring cannot be over stated and is of critical importance to practitioners being able to implement their work with confidence. This is true for any innovative methodologies, however it is particularly important in the case of dynamic assessment where psychologists require a lot of knowledge of child development, insight and ability to analyse cognitive processes, skills in mediating in non standardised ways, where there is greater role given to qualitative assessment. Some of the methods used for support and mentoring are:

Educational psychologists assessing in pairs, one psychologist assesses and the other observes. They are then able to discuss their findings together.
Dynamic assessment sessions are videoed for analysis by the individual or in small teams.
Educational psychologists are encouraged to involve teachers and parents in the assessment process so that communication of findings and learning implications for home and in the classroom are facilitated by the presence of parents and teachers in the assessment.
Peer groups within services sharing case studies using DA on a regular basis
Local and regional DA interest groups led by experienced practitioners.

When dynamic assessment courses are taught to Local Education Authority area psychology teams some time is spent practising DA at a local school and this is part of practitioner certification. Psychologists have to assess children, feedback to the school staff and write reports as part of their training. Training psychologists in

their local teams has the advantage of specificity to local needs. For example, a training course in DA in rural North Wales, an area where many children's first language is Welsh, focussed on the use of dynamic assessment with bilingual children. Local training also establishes a shared team ethos where practitioners can support each other. This facilitates the development and support of peer skills, without implying that every member of the team has to use the same assessment tools. A principle of good practise is the ability to select appropriate assessments to meet diverse needs, therefore knowledge and familiarity with DA enables the confident selection of tests and widens the range of assessment choices for the psychologist.

Across the UK support groups have been established either within local EP services or as regional networks e.g. the West Midlands Dynamic Assessment Support Group, which is led by two EP's experienced in Dynamic Assessment. Additionally on the educational psychologists internet forum, questions and information on DA practice is frequently exchanged. However against this background of widening training activities and increased interest, there are some important challenges which need to be addressed both as training and implementation issues. These are:

| The need for more extensive and intensive training in dynamic assessment because of the expertise needed in evaluating cognitive abilities in non-psychometric models and assessing the role and impact of the assessor's mediation within the assessment. The difficulty of relating the analysis of cognitive functions to specific curricular subjects, even for experienced DA practitioners has been frequently identified as an implementation issue.

| Limited time to carry out full dynamic assessments. For example, Feuerstein's LPAD model recommends many hours to be spent testing and teaching the learner cognitive principles and assessing the change from pre to post mediation. As the LPAD focuses on the learner's cognitive modifiability, this implies involvement over time to begin to see changes which indicate the next steps of learning. Few psychologists employed by government services who have large case loads, have the time or the opportunity to work with children in the way the model recommends. In a follow up study of

five years of dynamic assessment training of psychologists in the UK (Deutsch and Reynolds op.cit.) most respondents in the study were employed by Local Authority psychological services. Less than 15% where in private practise. Time constraints need to be considered if DA is to be more widely used in day to day EP practice. Not only is there is practical time limitation for 1:1 case work, but the orientation of psychologists in taking a wider ecological approach to problem solving with their clients school, teachers and parents has also led to reduction in the number individual assessments carried out

A recurring concern expressed by EP's is that many psychologists feel uncomfortable with what they perceive as a mainly qualitative form of assessment, and that interpretations made by the assessor, especially if not very experienced, risk subjectivity. Psychologists note difficulty in relating their findings to other assessment and achievement tests which are scored in a standardised way.

The Impact of DA on Schools

The third area relating to training and implementation of DA in the UK is to consider its impact on schools. Educational psychologists as a result of changing their interventions are changing expectations and are helping schools to begin to see their role not as deliverers of test scores, leading to placement decisions and sometimes financial support packages (although these are still part of Local Authority educational psychologists work), but becoming more proactively involved in giving teachers advice and support on learning strategies. This raises a further issue for psychologists trained in dynamic assessment, that is the difficulty of relating their analysis of the cognitive profile of the learner not only to curriculum content, but to classroom teachers who have not necessarily been trained in the same type of cognitive approaches. There is a need to transfer strategies and teaching techniques for promoting cognitive education (such as Mediated Learning Experience) in classrooms where teachers may have little or no training in these methods. An example is helping teachers develop methods of teaching for transfer (Kaniel,2001) and the development of metacognitive teaching for the generalisation of skills across different do-

mains. There are various thinking skills training programmes available in the UK such as Instrumental Enrichment and Philosophy for Children, however their use is relatively limited when looking at overall patterns of implementation across the UK [1]

Initiatives in training teachers to use cognitive principles and strategies in their classrooms are coming from psychologists who have undertaken training in dynamic assessment. A recent example is a book written for classroom unqualified assistants, (Arnold and Yeomans, 2004) with a chapter on mediated learning experience in the classroom. A number of educational psychologists are themselves undertaking thinking skills training in order to influence their schools to introduce more thinking skills into the curriculum and if possible to do direct work with schools. There are a number of examples of psychologists going into schools to teach thinking skills and giving workshops to school staff on topics such as mediated learning experience and developing cognitive processes in the classroom.

Another need which must be addressed in dynamic assessment training is to ensure that psychologists are able to record their DA findings in accessible reports, which in some cases must be incorporated into report formats used by the Local EP service and to learn how to integrate their DA observations with other assessments.

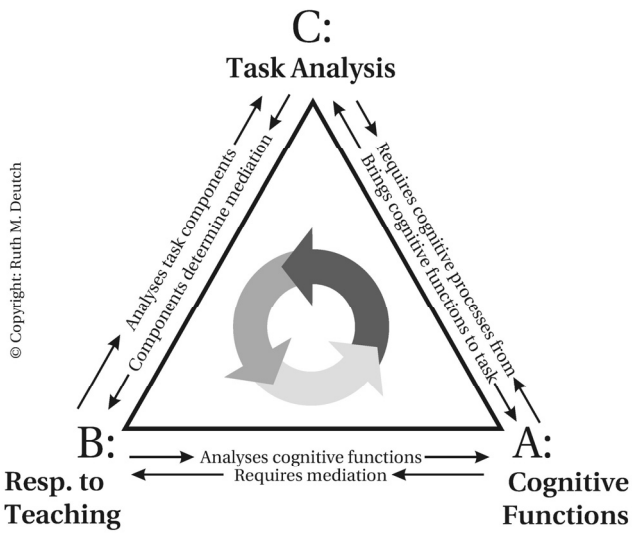
The Cognitive Abilities Profile (CAP)- addressing the need for wider user of DA

In response to some of the issues which have arisen in the training and implementation of dynamic assessment, the author and colleagues are developing a Cognitive Abilities Profile with the aim of bringing more of the benefits of a DA approach within the educational system and to provide a flexible tool for the use of psychologists and classroom teachers. Detailed description of the CAP can be found else-

[1] data obtained from the distribution centre for Instrument Enrichment materials in the UK, the Hope Centre for Cognitive Education, shows gradual increase in the use of IE, with uneven distribution in different areas. Commitment to ongoing local authority training such as is currently carried out in South Lanarkshire, Scotland is relatively sparse.

where (Deutsch Keane & Yeomans, in press). Briefly, CAP is a framework for consultation and observation of the cognitive needs of a child in the classroom, nursery or home, to be shared with teachers, parents or therapists using the principles of dynamic assessment, based on Feuerstein's LPAD. To ensure that the CAP can be used by educational psychologists to monitor cognitive changes over time, the authors have developed and adapted ratings scales for observation of various cognitive functions and to profile cognitive changes over time when there is little time for individual assessment.

The CAP is based on the analytical framework of the LPAD, the Tripartite Learning Model (figure1)



THE TRI- PARTITE LEARNING MODEL (figure1)

The content of the Cognitive Abilities Profile consists of 3 ratings scales

A) For identifying the learner's cognitive functions

B) For identifying the learner's response to mediation

C) For task analysis- matching the demands of the task to the abilities of the learner

Within each rating scale the assessor identifies 2 or 3 areas of cognitive strengths and cognitive weaknesses which are then incorporated

into the student's individual educational plan (IEP). These form the targets for intervention and are re-profiled over time. Research is taking place to establish inter rater reliability of the CAP and it is being trialled with various educational psychology services and group of teachers trained in DA or Feuerstein's Instrumental Enrichment programme. One area of investigation of inter- rater reliability is comparing different user groups according to their prior training. Initial results indicate that more experienced users of dynamic assessment i.e. those who have had more training, have greater confidence in using the CAP. This has important implications for the training of psychologists in order to make the tool as widely accessible as possible without diluting the benefits of carrying out a full dynamic assessment where this is possible.

Future Directions

Dynamic assessment appears to have much to offer (Sternberg and Grigorenko, 2000). In order to impact meaningfully on educational services and provide interventions that are useful for the inclusion of a wide variety of learners in mainstream and special education, the following may be considered:

Training teachers in cognitive education should be part of initial teacher training.

Dynamic assessment training for educational psychologists both introductory awareness as well as more extensive practical training, should be increased.

A diversity of training contexts and structures should be encouraged which would include centrally based e.g. at universities and regional and local area team training opportunities. Such diversity enables training and implementation of DA to be carried out in cost effective ways and promotes shared models of working and support.

More regional and local support groups should be set up and time allocated to group meetings should be part of Continuous Professional Development encouraged by local team leaders.

Educational psychologists' roles in school should increasingly incorporate helping teachers link cognitive abilities to curriculum

applications. This important area presents a challenge to those trained in cognitive assessment procedures to make the links between curriculum and underpinning cognitive abilities more explicit for the use of classroom teachers.

More research to be carried out on reliability of dynamic assessment and the relationship of such assessments to prescribed scholastic goals, whilst preserving the benefits of DA's qualitative and more clinical features.

To further the potential of DA in inclusive educational environments, future work could include:

Research and clinical studies of the use of dynamic assessment for specific types of special needs; developing and adapting tests for the use of DA with special populations, for example the use of DA with children with sensory impairments, autism and non verbal children.

To extend the use of dynamic assessment principles outside formal assessment settings such as the use of DA with children being looked after by social services

More Implementation of DA approaches by educational psychologists in community programmes such as Sure Start, a government sponsored programme to help parents and disadvantaged communities with early childhood intervention. Targeting parents of pre- school children, teaching them mediated learning in order to enhance their children's cognitive development, would be an important contribution by early years practitioners to reduce educational disadvantage for at- risk children.

Increased use of dynamic assessment approaches with mainstream students, that is, students who have not been specifically identified as having special educational or social needs. This would reflect the need for teaching transferable and metacognitive skills in an era of rapid technological change which is important for all learners for the future of our social and economic communities.

The move from awareness and interest in DA to active practitioner skills can be accomplished by trained professionals in many countries, who can further the teaching and practice of dynamic assessment and

impact on policy makers, academic institutions, psychologists, teachers, therapists and classroom assistants. Broadening the study of different approaches in cognitive education leads to selection, application and adaptation of different models to a variety of social, cultural and educational needs. Involvement in cognitive assessment and education places practitioners in a good position to demonstrate flexibility and adaptability in their own work. Finally, the accumulation of evidence based practise should be placed high on the agenda, demonstrating the importance of basing all our work on the need to be both practitioners and researchers.

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A DYNAMIC AND FUNCTIONAL APPROACH AS A BASIS FOR INDIVIDUAL EDUCATIONAL PLANNING IN INCLUSIVE CONTEXTS

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Foreword

School attendance for students with disabilities takes place according to a number of institutional procedures defined by Law 104, issued in 1992, which provides the general framework for the rights of handicapped people. In particular, these procedures, as specifically outlined in the Act enforced on February 24th 1994 by Presidential Decree, involve referral of the case, a **functional diagnosis** worked out by the Local Health Services, the assignment of a specialized support teacher and, when deemed appropriate, other professionals in the field of educational support or personal assistance, a **dynamic functional profile**, an **individualized or personalized educational plan**, with the relevant **progress reviews and evaluation**.

The first step concerns the **referral of the case**: the child with disability may access school having already a specific clinical diagnosis, in which case coordination among the different institutions involved has already been implemented; or it is the school that detects the disability during the teaching and learning process and refers the case to the specialist, provided parents give their consent, which leads to implementation of the subsequent steps in the process.

The statement of disability (**diagnosis**) permits the assignment of a specialized support teacher and the required aids and supports, but it does not per se provide the elements needed to get acquainted with the child; the clinical diagnosis becomes **functional diagnosis** (Art. 21 Subsection 5 L. 104/92 and Art. 3 Presidential Decree 2004) when it includes a specific outline of the pathology whereby disabilities, skills,

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competences and potential remedial action are presented.

In fact, saying Down Syndrome is not enough, as other elements have to be specified, like the degree of intellectual impairment, the difficulties in the area of abstract thinking and operations, in language and relational skills, as well as the specific functioning in the area of attention, memory and time-space orientation, and so on.

Such a diagnosis provides teachers with the first knowledge base from which the dynamic functional profile will be built, in collaboration with professionals in the field of health and social services.

The Dynamic Functional Profile

The **dynamic functional profile** provided for by Art. 12 Subsection 5 of Law 104/1992 and by Art. 4 of Presidential Decree 2004 highlights the physical, psychological, social and affective features of the student, outlining both the learning and communication difficulties, brought about by the disability and the possibilities for remedial intervention, as well as the skills which need support, stimulation and progressive strengthening/development in compliance with the cultural values and choices of the person with disability. The profile is followed by a monitoring action aimed at assessing the impact of the different remedial actions and the influence of the school environment.

The dynamic connotation of the profile stems from the fact that it is updated at different stages during the formal educational process, especially during higher secondary education, as it is not statically bound to the first observations and findings.

The different progress reviews help leave behind an entirely clinical approach to give room to the construction of a view which may prove more functional to the developmental opportunities and to a close monitoring of the intervention plan originally devised.

In the past, for instance, the medical doctor would put forward a diagnosis of cerebral palsy suggesting the person would never be able to rise from a given posture, while teachers may be able to achieve levels of recovery much higher than expected, helping the student gain greater functionality, proposing educational activities which prove capable of stimulating higher levels of mobility, probably in conjunction with rehabilitation procedures effected outside the school. Here is the case of a diagnosis subject to change and development.

The dynamic functional profile calls for meaningful action spanning from observation of behaviours through tests and questionnaires to description of possible developments in specific areas of intervention. In this phase, participation on the part of the family is vital, as an analysis of the situation is required which may highlight possible barriers preventing full implementation of the right to education of the student with disability.

Within this framework, the presence of health and socio-educational professionals must be considered a meaningful support to interpret and organize clinical and psychological data in a way that may help understand specific behaviours and responses, as well as to implement continuity between school activities and rehabilition /therapeutical intervention, whenever needed.

Teachers on their part, especially specialized support teachers, "must be in a position to understand in order to engage in a dialogue and in a interaction among peers": at this stage, it is of the utmost importance that teachers take on a "project-oriented view about education" in which "it is important to master a broad multidisciplinary theoretical base" (Canevaro, 1996).

We have therefore already identified the various actors contributing to the development of the dynamic functional profile, giving absolute priority to the role of teachers in the process:

. Subject-matter teachers
. Specialized support teacher
. The family
. The multidisciplinary team of the Local Health Service

The dynamic functional profile is worked out during a first period of school attendance, and it is therefore subsequent to the functional diagnosis: it indicates the expected level of development of the student with disability at short term (six months) and at medium term (two years).

The profile, based on the data recorded in the functional diagnosis, analytically describes possible levels of response on the part of the student to the relationships already activated and to those which may be implemented. It necessarily includes:

a) a functional description of the student in relation to the difficul-

ties he/she apparently meets in the different areas of activity

b) an analysis of the student's potential development short and medium term, based on the following dimensions:
    1) cognitive, assessed in terms of potential vs achieved developmental level, strategies adopted in order to solve age-appropriate tasks, cognitive style, ability to use different skills in an integrated fashion;
    2) affective-relational, assessed in terms of potential which can be expressed with reference to the self, the relationships with other people, motivation and attitude towards academic learning, with different partners;
    3) communication, assessed in terms of potential which can be expressed in relation to modalities of interaction, prevailing contents, preferred means;
    4) linguistic, assessed in terms of potential which can be expressed in relation to understanding of oral language, expressive language, use of verbal language for communication purposes, use of verbal thought, use of alternative or integrative languages;
    5) sensorial, assessed especially with reference to potential in terms of visual, auditory and tactile functioning;
    6) motor, assessed in terms of potential for fine and gross motor skills, simple and complex schemas, internalized motor planning skills;
    7) neuropsychological, assessed in terms of memory, intellectual and time/space organization skills;
    8) self-regulation, in terms of potential for social and personal independent functioning;
    9) learning, assessed in terms of potential related to preschool and school age (reading, writing, basic arithmetical skills, ecc.).

The Italian model we intend to outline here is quite complex and not always adopted in all areas of the country in all its steps. However, we believe such a pattern may help emphasize a few key steps in inclusion processes, while identifying specific competences and responsibilities. The outlined model articulates all the steps that the abovementioned Presidential Decree requires for the implementation of an

inclusion process. The said Decree gave rise to criticism in the past due to the complexity of the inter-institutional relationships and interventions that must be activated according to its provisions: some of the steps provided for have often been downsized in order to speed up the procedure. One has the impression, starting from a non-specialist perspective, that the scope of action for the Local Health Services is prevailing and at times involving strong interference in the educational field. Such perplexity is not entirely groundless, especially if we frame the problem in a broader perspective including not only disability but also special educational needs in general. It also stems from the fact that supports and aids both in terms of human resources and technical and material aids can be required only after obtaining a clinical diagnosis. As a matter of fact, based on our experience so far, the steps described in the model contribute, if correctly implemented, to pursue the goal of inclusion effectively. Some phases could undoubtedly be simplified and the roles of the different professionals could be better specified. Some of the changes proposed refer to the need to stress the central role of Educational Institutions with respect to Health Services: the analysis and review of the students' potentials and competences should be coordinated by the school which should take on responsibility for promoting collaborative efforts among internal and external professionals. Both pedagogical and didactical actions must be strengthened, emphasizing the contributions of professionals like educational specialists, educational psychologists and social workers, together with subject-matter teachers and specialized support teachers.

The kind of analysis required to draw a dynamic functional profile, in fact, enables to shift our focus to the context and to participation processes, concentrating not exclusively on the action of the person with disability within the narrow framework of people with the same type of difficulty: a pedagogical interpretation is therefore required as a function of the relationship between the subjects involved and the environment which should thus take on the connotation of an integrating background (Berlini & Canevaro, 1996).

The integrating background is mentioned also in relation to the shaping of learning environments and communities of relationships.

We may mention, with reference to notion of integrating background, Oury's institutional pedagogy, Winnicot's potential space, and Vygotskij's zone of proximal development and outline the different didactical modalities which may be worked out and implemented within its framework, from de La Garanderie's pedagogical dialogue, to Feuerstein's mediated learning experience (Avanzini, 1992). In any case, we are discussing lines of theoretical interpretation, intertwined with operational aspects, which emerge through narratives: dialogue, listening, relationships, mediation, exchange, the wish to change on both parts. The organizational implication of an integrating background should not be underestimated in view of a coordinated planning of resources and of an appropriate assignment of responsibilities to the different institutional actors, professionals and the very subjects involved. From the point of view of organization, a meaningful role is played also by aids, technical equipment and didactical tools for schools (Tortello, 1996).

The educational action involves devising possible inclusion trajectories, tailored to the specific needs of the student with disability with whom we engage in a teaching-and-learning relationship, but it also includes the action aimed at the group of students who are involved as active partners in inclusion processes. In the beginning, a pro-social background is shaped, by weaving networks of positive attention and support among classroom-mates, focusing in a very concrete way on the building up of a community of pro-social relationship in the group, through which every member can feel his/her own participation and value (Canevaro, 2001).

OMS' new ICF, International Classification of Functioning, is a very powerful tool for this educational action in order to share, also with the Health professionals, a new social model based on health, and on the correlations between structure and function, participation and environment, as well as on the meaning of the term "performance".

The Individualized or Personalized Educational Plan: Program, Planning and Curriculum

Once the data have been acquired and the dynamic functional profile has been drawn with its axial synthesis, it's time to design the **Individualized or Personalized Educational Plan**, that is the elaboration of

an adequate educational programme, a qualitative ongoing assessment and a final evaluation of major goals.

One must admit that educational activities should be individualized for any student, in other words they should shape teaching and learning situations which, taking into account individual differences detected in students, may offer differentiated and facilitating learning opportunities, so as to produce a change in the original conditions towards the achievement of optimal final standards for all. In fact, an educational-didactical action aimed at teaching-and-learning for all involves on the part of teachers the ability to present the relevant subject-matters through a differentiated approach, taking into due account the students' different learning styles, in order for them to meet with ways that are really suitable for their specific skills. Such individualized teaching would enable also otherwise able students to meet with the best teaching-and-learning process for them (de Anna, 2003).

In Italy, curricula are defined on a national level for their 80%, while the provisions for school autonomy allow to include actions aimed at meeting specific instructional needs in the area, or requirements on the part of families, in the Plan for the Educational Offer defined independently by each school. In implementing these plans, efforts are made in order to go beyond the external notion of programme so as to build, through the curriculum, teaching-and-learning strategies and to envisage also a selection of contents.

Adopting the notion of curriculum within the framework of educational planning therefore calls for a deep understanding of the school setting, a detailed analysis and description of instructional goals, the production and use of more complex didactical materials, and an evaluation of the curriculum design as such (Maragliano & Vertecchi, 1992).

The notion of curriculum includes all the key elements in the didactical process and it is based on criteria like flexibility, well-thought out selection, attention for environmental circumstances and practical conditions in the school setting, availability of resources and, above all, students' knowledge base, skills and motivation (Pontecorvo, 1978).

For a student with disability, especially in a severe condition, the

choice for a functional rather than an instrumental curriculum is at times essential: when we analyse the different situations we are in a better position to identify what functional curriculum concretely means, which is extremely importance in view of the implementation of a meaningful life project, essential for any student, but even more so in the case of a student with disability, as it may offer the key element for inclusion in society as such.

A functional curriculum aims at developing basic skills for independent living and integrating skills. While by basic skills in this case we mean behaviours required for independent living, integrating skills are those more complex behaviours which enable people to move, even outside the family environment, with little if any support on the part of caregivers: among these, reading the clock, using the phone, using public services, managing the household and others. As to the development of the above-mentioned basic skills, a key role is played by the family in close cooperation with teachers. As it happens with other developmental areas, teaching basic and integrating skills for independent living calls for specific planning which can and must take place together with classroom mates. All this requires hard-working and closely cooperating teachers, both subject matter specialists and specialized support teachers, who fully share responsibility for all their students. The planning should specify possible connections between the general plan for the class and the individualized plan for the student with disability, avoiding exclusion and delegation to the specialized support teacher, while adopting integrated didactics and more specific strategies when needed (Ianes, 2001).

Progress Reviews and Evaluation

Based on the choice made by the teaching team, the Italian legislation allows for a few **evaluation** criteria, related to the different types and conditions of disability.

As far as students with sensorial and physical impairments are concerned, normally no differentiated evaluation is adopted, while particular didactical tools identified by the teaching team can be used in order to ascertain the level of learning which could not be detected through an interview or through traditional written tests.

For students with psychological-physical disability, the evaluation, owing to its educational and pedagogical character as well as to its stimulating power for the student, must be effected by the whole council of teachers, at the end of the terms (3-months or 4-months) and at the end of the school year, based on the Individualized Educational Plan according to the following steps:

a) analysis of evaluation elements provided by individual teachers on the learning achievements, also through inclusion and support activities;

b) review of overall results in relation to the goals set forth in the Individualized Educational Plan;

c) evaluation of such goals, in particular if and to what extent those goals were achieved.

The council of teachers may find out that the student's level of instruction complies with the didactical goals set forth by the national curriculum, or at any rate that it proves adequate according to those standards, in which case the decision complies with the same system used for any student.

In order to support the right to education of students with psychological disability, and exceptionally, with physical and sensorial disability, the individualized educational plan can be differentiated in view of didactical and instructional goals which are not compliant with the national curriculum. In this case, the council of teachers must draw a detailed report on the matter and evaluates achievements in learning , attributing marks that are relevant exclusively to the individualized plan and not to the national curriculum.

As a consequence, the final evaluation has legal value only in relation to school attendance aimed at pursuing the goals specified by the individualized educational plan. Based on this, a choice can be made on letting the student access to subsequent grade or else to attend again the previous one.

For these students, the final document should carry the following statement "These marks are referred to the Individualized Educational Plan and not to the national curriculum, in accordance with Art. 13 of Ministry Order n.80, 9 March 1995"[i]

Students with such differentiated evaluations can take final exams for professional qualifications and mastery, conducting differentiated

tests, in accordance to their educational project, which are meant to certify acquired competences and skills. Such certificates, especially when the individualized educational plan involves activities in the form of professional orientation and training, working stages and field experiences, provide credits which can be spent in subsequent professional training courses organized thanks to specific agreements between educational and regional authorities.

Should the student fail to pass, the council of teachers has to decide whether or not to agree on a further reduction in the didactical goals of the individualized educational plan. In any case, it cannot be denied to a student with a disability (physical, sensorial, or psychological) attendance for the third time to the same school grade. In case "during the subsequent year the level of learning recorded complies with the goals set forth by the national curriculum, the council of teachers agrees to evaluate the student in a non-differentiated manner, with no need for specific tests relevant to subject matters of the previous year/years, as the council can already rely on all the elements required for the evaluation"[ii].

Should the council of teachers decide to adopt such differentiated evaluation, it must give immediate notice to the family, providing for a deadline to communicate formal consent, after which the proposed evaluation procedures will be held as accepted by the family. In the event the family should openly refuse to accept them, the student cannot be considered in a condition of disability, and therefore must comply with the same evaluation procedures as the others[iii].

To sum up, the individualized educational plan takes into account the need and the possibility of educational action for the student with disability, and based on this it performs a selection of contents that may help achieve previously set goals, which involves that progress reviews and evaluation refer to what has been planned in the specific case rather than what set forth by the national curriculm.

In higher secondary education, based on Judgement 215-1987 by the Constitutional Court and of Circular 262-1988 of the Ministry of Education, attendance on the part of disabled students is provided for even in the most severe cases, precisely as a function of their educability rather than the specific knowledge base acquired (in which case no legal final certificate is issued).

For students with disabilities, the Italian model does not build ex-

clusively on the concept of achievement of normal standards (according to which passing from one grade to the next is only possible for those who reach skills and competence of typically-developing students): it rather aims at the continuity of the educational and instructional process at any level, pursuing curricular learning whenever possible, and introducing differentiated didactical paths according to the type of disability, of the activity to be performed, of the residual potential for development.

Such a vision justifies project outlines that are very complex and articulate, which call for the involvement of the whole teaching staff, the family, and all the different institutions (educational, social and health services) which are asked to play responsibly their part in the inclusion processes of students with disabilities, as provided for by Law 104/92.

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INCLUSIVE POLICIES IN THE CZECH REPUBLIC, WITH SPECIAL REFERENCE TO ASSESSMENT PRACTICES

VĚRA POKORNÁ[1]

Integration policy in the Czech Republic has been introduced after 1989 only. In the last period the integration has changed towards broader social acceptance of integration of persons with disability towards mainstreaming and better educational and technological support for childern with disability in integrated settings. The main goal is to create equal opportunities and minimise the negative impact and consequences of the disability to the pupil's access to appropriate level and quality of education.

The responsibilities in education were transferred from the Ministry of Education to regional educational authorities four years ago (1st January, 2001). The regions (14 in total) are also responsible for developing the regional policy and implementing the main goal and principles of education of pupils with special needs. The new understanding of the concept of education of pupils with disability has influenced the terminology, which has changed from a medical model into a functional one.

Problems:

1) The term *inclusion* and the philosophy of this concept *are not adequately known* in public among administrative officials and even among professionals. The term "integration" is still being used. From this point of view another problems arise.
2) Integration policy is still not a part of the Education Act. The New School Law has not yet been approved by the Parliament.
3) There are only *limited resources* for assigning additional support teachers into a mainstream class with integrated pupils with special educational needs.
4) The individual needs of an integrated pupil and the educational management of the whole mainstream class is *extremely demanding*, if the necessary personal assistance to the pupil with special needs is not provided.

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5) There are still many schools that are *not accessible* for pupils with physical disabilities, because of architectural barriers.
6) Traditional thinking patterns of teachers and their *resistance to change*. Regular teachers are often reluctant in finding and applying different approaches according to the needs of integrated pupils.
7) Historical heritage of the existence of a dual system of education. Many teachers and parents consider the separate education at special schools better for satisfying the needs of a child with disabilities. The special institutions were mostly founded at the beginning of the 20th century, some of them even before. The professionals of these special schools are very experienced.

The pupil with special educational needs is considered a person whose educational needs cannot be met under the conditions of regular education and who, in order to benefit from the process of education, has to be educated by means of special pedagogical methods and approaches. This definition describes only the need of special education but has nothing to do with placement of children with special educational needs into a special school. The choice of placement (special school, special class, and individual inclusion) is the parent's decision.

Total numbers of pupils (in compulsory education, including special education)	1,146,607
Total numbers of pupils officially labelled as having special educational needs	111,606
Total numbers of pupils in separate special schools	43,848
Pupils without any handicap in these schools.	349
Total numbers of pupils fully included in mainstream education	5,088
Total numbers of pupils in separate special classes in mainstream schools (where they receive at least 80% of their education in that special class)	11,977
Pupils without any handicap in these classes.	98

The actual situation in the year 2002
(from the report of Ministry of Education)

Integration and Teacher Support

The national strategy for developing the process of integration is focusing on the classroom teacher as the most important element of this process. The classroom teacher is a key person in managing the whole class and in meeting the needs of each pupil in the class. This demanding position and responsibility has to be compensated through various supporting measures.

One of these measures is professional development of teachers. Since the curricula of previous teacher training programmes were lacking the thematic part concerning education of pupils with special needs, the in-service training programmes are considered one of the most important tools towards successful integration of pupils with special needs. This support of the professional development of teachers is financed with public funds at the most. Within this task of the in-service education the role of so called Pedagogical Centres (*pedagogická centra*) is growing. The Ministry of Education is preparing a strategy for further education of educational staff with regard to the system of salary structure and teachers' responsibility.

The other supporting resource represents the counselling system that has been rapidly developing since 1989. Its role is now being stressed by the responsibility of counselling psychologists or counselling special educators for service delivered directly to the integrated child, following the child to his/her mainstream school placement. Special educational centres (*speciálně pedagogická centra)* or educational and psychological guidance centres *(pedagogicko-psychologické poradny*) exist.

Psychological guidance centres are special purpose bodies established by regional or communal bodies or other legal or physical entities. The activity of a guidance centre is responsible to its of the organising body and centres can also cover a broader area, e.g. cities, villages.

At present there are around 90 of such psychological guidance centres. In terms of methodology and theory, they are supported by the Institute of Educational and Psychological Guidance and Departments of Psychology and Special Pedagogy at Universities. They also cooperate with establishments for institutional or preventive care. Several private guidance centres have been established.

The main tasks for guidance centres at different stages of development are:

1. At the pre-school age - examination of the development of cognitive abilities, evaluation of readiness to attend school.
2. During primary education - work with pupils with behavioural and learning difficulties, processing background information about the integration of handicapped pupils (diagnosis of specific disorders in learning and behaviour), work with gifted children, professional and study choices of pupils (in co-operation with information and guidance centres attached to Labour Offices).
3. At the upper secondary school level - educational issues, developmental problems, social adaptation, and carrier guidance.

Special educational centres provide services to children and young people with perception, physical and mental disabilities and to their parents. They are usually established as parts of special schools. They offer diagnosis, re-education, compensation, psychotherapy and special pedagogy, particularly to children who are not placed in special schools, but included in regular schools. Children are seen as outpatients in the centre, at the school they attend or at their home. The special educational centres have made it possible to integrate pupils with disabilities into schools near their homes and helped not to move children in the special education away from their families. Special educational centres help the parents of children with mental disabilities that cannot be integrated into schools in the main stream, especially in the pre-school period, with the preparation for school life and later in finding the best possible vocational training. The work with young clients and their parents is regular and long-term.

Special educational centres focus on one type of disability (visual, hearing, mental, speech and language impairment, specific learning and/or behavioural problems, multiple disabilities, autism, pupils with chronic illness, young delinquents), so there are a relatively high number of them (89), although their uneven distribution means that there is still a lack of them. The recommended staff composition is two special educators (for pre-school and school age), one psychologist and one social worker.

The counselling services follow both children with special needs and mainstream teachers. Also parents of the child are given the guidance through the counselling system. Within the strategy towards suc-

cessful inclusion "teaching the intact majority of pupils" at each mainstream school, as well as the staff of each school plays a very important role in generally accepting the concept of inclusion also.

Also the role of non-profit, civic organisations is supportive and their influence of public meaning about people with disability and integration as such is tangible.

Recently, the special teachers fully qualified in special education started to become a part of the regular staff of the mainstream school as an efficient source of regular teachers' support.

The support teacher – *teacher's assistant* is becoming a reality, though this kind of support is still more or less the exception rather than a regular routine within the educational system due to the national budget limits.

Special education centre or educational and psychological guidance centres provide a person, who assists a teacher of an integrated pupil. The teacher is also supported by a specialist for specific activities (e.g. sign language, reading Braille etc.).

Besides consultation with a specialist of special education centres or educational-psychological centres, the teacher can visit special schools of related type, participate in seminars organised for teachers of mainstream schools with integrated pupils.

Special educational centres or educational and psychological guidance centres create individual study plans for an integrated pupil in co-operation with the child's parents and teacher from the school concerned.

THE DILEMMA BETWEEN ASSESSMENT AND STANDARDS IN LATVIA

Zenija BerzINA[1]*The presentations on the dynamic assessment remind me my personal experience of the primary school. At those times we had a subject in our curriculum called 'neat-writing'. My memories of the neat-writing lessons are still a nightmare. Even now after so many years I remember how much I tried to do my best to hit the stripes, the ovals, the loops and the hooks in the grid of the horizontal, vertical and oblique lines. I was one of the best students of my classroom; I got the highest marks in all subjects except neat writing. Being a very diligent student I spent hours exercising. I cried. I really thought that there was something wrong about my learning. And there really was, but it was nothing of my diligence. The problem was my short sight. Having as severe short sight as I had, it was impossible to meet the standard.*

I had a wonderful primary teacher, who really loved us. I still remember her name, her face, her clothes, which I liked – the rosy jacket and the grey skirt. But even she was not able to overcome the perception of the standard as something above the humane. She tried to help me, she tried to comfort me saying that I still am the best student, but she assessed the result of my hours' long effort by threes, which was a very low mark.

Unfortunately, I should admit that there has not much been changed with respect to the assessment of the students learning in our schools in Latvia. Though we do not have the neat writing in the schools' curricula, and despite that we have introduced the non-marking assessment in primary level of education and 10-points assessment in secondary education, however the 'product' of learning and its compliance to the standard is the focus of the assessment. The process of learning is still out of the 'interest zone' of the assessment. The centralized testing of students achievements in the end of the stages of education (primary. lower secondary and upper secondary), as well as many in the duration of each stage, also leads to focusing on result.

The other even more essential reason, why there is not much change in assessment of students, that is lack of the appropriate teacher training. This is the reason why the Centre of Education Initiatives, participates in the INCLUES project – to learn ourselves, to disseminate the knowledge we get to teachers and educational administrators, and above all – to make the children's learning meaningful and joyful.

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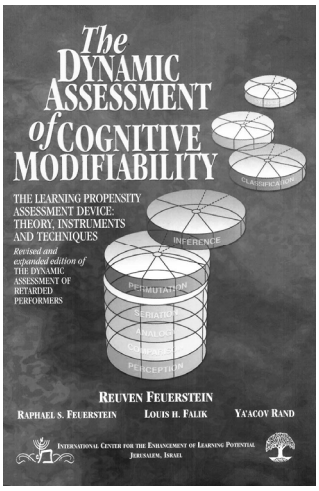

BOOK REVIEW

THE DYNAMIC ASSESSMENT OF COGNITIVE MODIFIABILITY: THE LEARNING PROPENSITY ASSESSMENT DEVICE: THEORY, INSTRUMENTS AND TECHNIQUE

FEUERSTEIN, R.
FEUERSTEIN, R.S.
FALIK, L.H. & RAND, Y. (2003)

Jerusalem : The IELP Press. ISBN 965 – 90490-0-5

When I was a young educational psychologist in the late 1960s, I found myself becoming increasingly disenchanted with the fact that I had been trained to function merely as a super-efficient psychometrician. It seemed to me at the time (and, it still does to a certain extent) that my chosen profession was built upon an untenable set of assumptions about the nature of intelligence, its measurement and its value in predicting academic success and failure. I subsequently published several articles in professional journals which were highly critical of intelligence tests and testing, one of which was entitled, 'If we throw the tests out of the window, what is there left to do?' Needless to say, few coherent answers were forthcoming at that time.

When I founded the Master's degree training course in Educational Psychology at Exeter in 1971, I was determined to take a totally fresh approach to the preparation of professional educational psychologists, and for a time we refused to teach the administration of IQ tests at all. Whilst helpful in stimulating the creative instincts of me and my colleagues, this approach tended to create as many problems as it answered.

Then in the early 1980s a colleague presented me with two books which changed my professional life. These were 'The dynamic assessment of retarded performers' and its comparison volume 'Instrumental Enrichment', both of which were written by Reuven Feuerstein and his brilliant team of co-workers. The first of these books, published in 1979, can truly be considered to be the first book to introduce the no-

tion of dynamic assessment to the world. In doing so it introduced us also to the Learning Potential Assessment Device (LPAD) which enabled us at a stroke to throw off the shackles of IQ testing.

There have been many books and articles written about dynamic assessment since that time, some good and some downright awful, but none have had anything like the same impact as that first, seminal volume. It heralded a revolutionary paradigm shift in our thinking about cognitive assessment.

It was with some trepidation, therefore, that I approached what I thought would be merely an updated version of that groundbreaking tome. There can be no doubt that an updating was needed, particularly in view of the weaknesses that had become apparent in the administration and scoring of the LPAD and in funding scientifically acceptable ways of reporting findings. But could this be done without losing the fundamental essence of dynamic assessment?

I need not have worried. Whilst this is in many respects an updating, in other respects it is a completely new book. Note first the wording of the title with its change of emphasis from 'retarded performers' to 'cognitive modifiability', thereby announcing that dynamic assessment is applicable to anyone, not just retarded performers, and is concerned with assessing cognitive *change*. Note also the change of wording from learning *potential* to learning *propensity*, which takes us further into the realm of likelihood or capacity.

The book is in four parts, the first of which (three chapters) provides a helpful review of the theoretical and conceptual foundations of dynamic assessment.

This first section serves as a really helpful introduction to the fundamental differences between static and dynamic assessment as well as providing the clearest summary that I have read of the ways in which the various forms of dynamic assessment are similar and different. In particular, it highlights the unique aspects of LPAD assessment and its theoretical foundations. Here and elsewhere in the book there is an impressive coverage of the fundamental research literature, but I must admit to a slight sense of disappointment that few of the references cited are post 1994.

The book's second section describes the various sections of the LPAD and the established procedures for individual and group ad-

ministration. There is little that is new here, but interesting complementary chapters describe the development of LPAD extensions to young children and special populations, all of which is 'fleshed out' by a number of descriptive case studies.

The third section, devoted to research applications, begins with a previously published chapter on how the LPAD was originally developed, which is followed by an exploratory section on devising an appropriate research methodology for testing the LPAD model. I found this chapter one of the least convincing, but it is followed by informative descriptions of using the LPAD with Ethiopian and with Down Syndrome populations.

I found the final section, which is mainly devoted to producing profiles, reports and recommendations following LPAD assessment, to be the most novel and, for the experienced practitioner, possibly the most useful aspect of the book. LPAD profiling has been one of the most contentious and most nebulous aspects of the dynamic approach to assessment. For the first time in my experience the key issues relating to this area are tackled in depth in a manner that is both intellectually challenging and practically useful. This chapter alone should be essential reading for any professional seeking to move beyond the constraints of traditional test reporting.

This is a broad-ranging book which goes far beyond a description of the LPAD and its applications. Like its predecessor, it deserves to become a seminal text for anyone wishing to gain a deep understanding of what dynamic assessment can and should involve.

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INCLUES
CLUES TO INCLUSIVE AND COGNITIVE LEARNING ENHANCEMENT IN SCHOOLS

European Comenius Network Project

The INCLUES project wants to create a network of educational professionals and parents working towards the realization of inclusive & cognitive education.

Inclusive education is defined as providing adapted, individually tailored education for all children in peer & age-related groups, across a variety of needs, abilities and levels of competences. It provides the necessary support within the normal classroom. It involves teaching children with learning difficulties (whatever their origin – social or disability) together with "normally" learning children.

Cognitive education aims to activate a child's basic cognitive skills (involved in learning basic academic skills, as well as social, motor, artistic and emotional adaptive learning), in order to develop its capacity to learn how to learn, to find the "clues" of learning. Hence the name IN-CLUES.

The INCLUES network is being co-financed by the European Commission within the Comenius Programme, from 1 October 2003 until 30 September 2006.

Objectives

1. Transforming teachers' attitudes and classroom practice, so that they would appreciate more and start developing hidden learning potential of pupils, create more successful learning experiences and competencies and therefore exclude less
2. Promoting cognitive education as an instrument towards inclusive education.
3. Re-educate teachers to teach in a more process-oriented way: *develop* basic prerequisites of thinking, which are (mental) instruments to develop *autonomy* in order *to learn how to learn*.

4. Transforming school systems, curricula, and teacher training, by infusing them with a cognitive and inclusive dimension.
5. Promoting innovative didactic approaches which address the child's individual differences
6. Promoting more dynamic systems of evaluation & assessment

Target group

Educational professionals (teachers, educational psychologists, special educational needs teachers, rehabilitation professionals, etc.) & parents working with children who are educationally at risk of exclusion from the mainstream = children with learning difficulties regardless of the "distant" causes (can be ethnic minority, disability, or socio-economic deprivation).

Activities

1. Web-based discussion forum & quarterly newsletter
2. Collection & web publication of meaningful experiences
3. Collect & exchange information regarding didactic methodologies & educational materials dealing with inclusive and cognitive education
4. Organize regional and international seminars
5. Promote the organization of local workshops
6. Monitor local progression with implementing inclusive and cognitive education
7. Translation & dissemination of relevant teacher and pupils' materials into Spanish, Italian, Dutch, Czech, Latvian, Norwegian, etc.
8. Network meetings with a limited number of experts
9. Editorial work: publish a series of special issues of a professional journal on the subjects of dynamic assessment, cognitive & inclusive education, a book and a CD
10. Lobby on national/ regional levels with educational authorities and main actors

Expected Outputs

1. Interactive website
2. Selection of relevant experience, theory and programmes regarding cognitive activation & inclusion
3. List of criteria for assessing inclusive education related to cognitive activation
4. Translation of teachers' guides regarding cognitive & inclusive education
5. Special issue of a professional journal and of a book on theme of dynamic assessment, cognitive activation & inclusion
6. Guidelines for curriculum transformation of teacher training at undergraduate and postgraduate level
7. CD-ROM or DVD containing all above materials
8. Local/regional support centres for research, training and awareness raising on issues of Inclusion and Cognitive Education
9. International inter-university Master's degree in Cognitive & Inclusive Education

Main events

1. Regional conferences on mediated learning Antwerp Belgium December '03, '04, '05 (Dutch language)
2. Network Conference on inclusive & cognitive education Madrid 3/5/04 (EN-ES)
3. Summer course on inclusive education, Latvia, 4-6 June 2004 (EN-LV)
4. International Summer course on cognitive education and dynamic assessment, + Day Conference on Inclusive & Cognitive education, Amsterdam, 11-22 July 2004, in cooperation with the International Centre for the Enhancement of Learning Potential (Jerusalem) (EN-FR-ES)
5. Network Conference on Dynamic Assessment in Inclusive Education, Milan, 22/11/04 (EN-IT)
6. Skandinavian Conference on Mathematics Bergen, Norway 27-31 /10/2004 (NO-EN)

7. Network Conference on Inclusive & Cognitive Education, Riga, 9th May 2005 (EN-LV)
8. Summer School on Cognitive Education& Dynamic Assessment, in cooperation with ICELP: Paris, France, July 2005 (EN-FR-ES); as well as in 2006; location not yet known
9. International Network conference Prague 30/10-1/11/05 (EN-CZ)
10. Regional seminar on inclusive & cognitive education Mallorca, April 2006 (ES-EN)
11. Final Network Conference on inclusive & cognitive education, Rome, 15-18 September 2006

Expected impact

1. Recruit at least 2 schools per partner willing to run pilots in inclusive & cognitive education & mediational teaching strategies
2. Reach out to at least 1 Teacher Training College/country who will include new approaches in undergraduate studies, thus forming about 1200 new teachers
3. If 2 psychologists/ partner choose to go for a thorough dynamic assessment training and implement it with children, this might make a change for hundreds of children in the end
4. Involve at least 2 educational policy makers per partner, by inviting them to become involved in advisory committees on building inclusion policy
5. 2000 educational professionals participating in seminars and conferences
6. 1000 teachers participating in training modules on cognitive & inclusive education
7. Expansion of network to 25 partners

Partners

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Contents

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