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 creator, 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 modifiability 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 differentiated from conventional psy-
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)

Although 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 impor-
tant perspective toward reaching a meaningful assessment of modifi-
ability and search for the most efficient and economical ways to over-
come 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 as-
se ss ment, notably from the search for stable characteristics to that of
determining the potential for modifiability of the individual. This re-
quires 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 instru-
ments present a sharp departure from the goals usually set for assess-
ment. 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 characterized 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 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 acquisition 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:

<table>
<thead>
<tr>
<th>Standard Instruments Focusing on Visual-Motor and Perceptual Organization</th>
<th>Basic Instruments</th>
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<tbody>
<tr>
<td>Organization of Dots</td>
<td>Counting Dots</td>
</tr>
<tr>
<td>Complex Figure Drawing</td>
<td>Complex Figure (Simplified)</td>
</tr>
<tr>
<td>Diffuse Attention Test (Lahi)</td>
<td>Spatial Organization</td>
</tr>
<tr>
<td>Reversal Test</td>
<td>Mazes</td>
</tr>
<tr>
<td></td>
<td>Flat Puzzles</td>
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</tbody>
</table>

| 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 geometric figures formed by connecting appropriate dots which are presented to the subject in an amorphous array (within a defined frame or field). The modality is figural, with the task performance being motor and requiring eye-hand coordination. 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 administration 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 structuring 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 maintenance 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 differentiations 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 segment 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 absence 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 plate 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 imagery.

The interpretation of results on the Plateau Test takes into account both quantitative 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 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 conditions of reduced visual cues, (2) assess the capacity 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 perceived 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 suppressing 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 principle 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-mediatational 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 accessible 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 temporal 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 interven-
tion on the subject’s capacity to cope with tasks that become increas-
ingly more complex, require higher levels of integration of informa-
tion, 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 prerequi-
sites 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 trans-
formations as they are present in the visual field. Through verbal de-
scriptions 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 media-
tional 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 ob-
jective for mediation is the regulation of behavior, controlling impul-
sive behavior, stimulated by the pressure for unchecked verbal re-
sponses which tend to produce errors.

**Numerical Progressions (NP):** This test assesses the subject’s ca-
pacity 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 ac-
cording 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 indi-
cates 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 differentiation, 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 elude relationships, define them as rules, and apply them in constructing and generating new information, (2) to assess the subject’s acquisition of strategies necessary for the eludiong 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 acquisition and/or accessibility 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 eluced 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 to use two or more sources of information, impulsivity, lack of comparative behavior, inadequate 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-
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 prominent 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 im-
pairments in one phase effects or is affected by impairments in an-
other; 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 em-
pirically 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 com-
parisons 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 test-
ing makes the approach time consuming, with the skill analysis and
methodology (of test/retest and mediational intervention) further ex-
tending the time needed to complet the procedure; group administra-
tion 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 opera-
tional definitions of mastery and grasp of the principles of what is be-
ing learned, and imply that the instruments and procedures utilized
may not fully elucidate them. They argue for “distinguishing opera-
tions from strategies and relating them both to specific contents and
modalities. This would help to clarify what can be observed with LPAD

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 research 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 demonstrated 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-related 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
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 corollary 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 commitment 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 allegiance to the psychometric model, ...such constraints on design and process impose 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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