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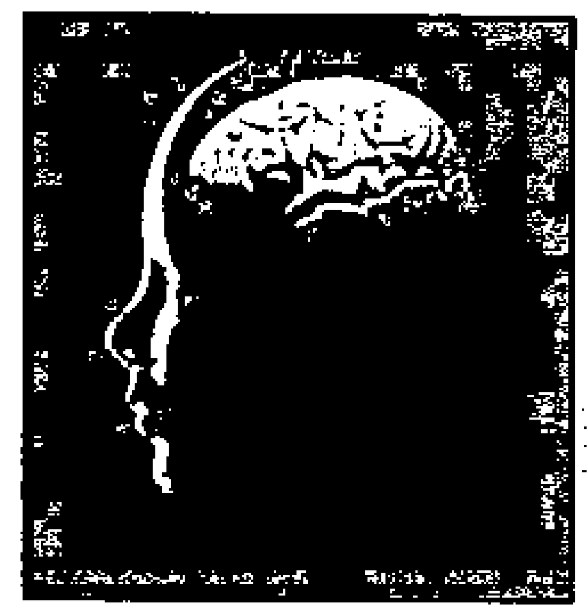

Mediated Learning and the Brain's Capacity for Change

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THE AUTHORS DEDICATE THIS BOOK TO

the loving memory of Berta Guggenheim Feuerstein (Z''L);

our beloved wives Tal Ben-Ari Feuerstein and Marilynn Lubin Falik, for their love, support, and ongoing dedication and engagement in the meaning and manifestation of this work;

and to Malka Hoffman, who dedicated her life to the promotion of the applications of the work presented in this book.

Contents

For example, if we succeed in matching the intensities of the stimulus to the type of barrier, a substantial change occurs: those who are considered as lacking the ability to learn—who are, for example, incapable of speech, reading, identifying things, or using their minds—gradually acquire these abilities and become capable beings. We have demonstrated this through the unique methods that we developed with Down syndrome children, children with chromosomal disorders such as Fragile X (broken X chromosome), and other types of disorders that in the past were regarded as unmodifiable.

BREAKING THROUGH THE BARRIERS BY MEANS OF MEDIATION

Every barrier can be crossed if the mediation, as a direct proximal factor, is compatible with the difficulties observed and assessed and reaches the person. We have treated children who, from the standpoint of their thinking capacity, were apparently extremely limited due to a lack of mediation for various reasons. For some the environment did not supply mediation, while internal barriers prevented others from receiving mediation. Consider the conditions of hyperactive or autistic children who are not able to communicate with their environment because of emotional barriers and usually are not affected by normal levels of exposure to mediation.

For children such as these, we created a mediation system that was administered to them by their parents (at least to begin with, because sometimes the parents can do very little for the child who does not accept them. Sometimes, such children cannot be mediated by their parents but are capable of responding to other mediators). As soon as we succeeded in creating an awareness of the proper need for intensity, consistency, and suitable forms of mediation, we succeeded in penetrating the barriers and creating in the children foundations that would enable them to use every exposure to events and experiences to learn. Mediation is liable to modify individuals even when they do not receive it in time and when its absence caused a lack of functioning, and also at later stages in one's life, whether the barriers were generated by environmental sources or from internal sources in the person.

HUMAN BEINGS ARE MODIFIABLE

Thus far, our discussion has pointed out that—despite the factors that have brought individuals to their low levels of functioning and their age or the severity of the condition—if MLE is provided with the quality, intensity, focus, and an understanding of the skills and experiences that need to occur, mediation will have such power that it will penetrate the barriers that existed or that were created due to a lack of mediation. This is the optimistic message of cognitive modifiability and mediated learning experience. With this premise in mind, we can turn to the applications of MLE to exploit the ability of the mind/brain to change and be modified

CHAPTER 9

Recognizing and Improving Deficient Cognitive Functions

In the previous chapter we described the causes of the absence of mediated learning experience (MLE), and we indicated that they derive from two sources: from an unmediated environment for various reasons (exogenic or environmental factors) and from the internal obstacles preventing human beings from receiving the mediation available and offered (endogenic factors).

The absence of mediation adversely affects not only the human ability to adapt to the necessary and desired changes in the environment and experience but also the thinking and learning processes themselves. We are able to describe the psychological-mental foundations of the thinking, learning, and modification processes that are required for mediation. One such description is a list of cognitive functions that may be deficient or impaired, divided according to the three stages of the mental act: the input phase (the gathering of information), the elaboration phase (the processing of gathered information), and the output phase (the communicating of the outcomes of the two preceding phases). We shall begin by briefly describing the two phases that can be considered peripheral—the input and output—and then discuss what we consider to be the central phase of human mental activity: the elaboration, or process, phase.

When we denote them as deficient functions we are not being negative or pessimistic. Quite the contrary—we identify them as deficient in order to direct our efforts to improving the functions. This expresses an essential optimism: that they can be changed and that we can direct interventions to their modifiability.

THE INPUT PHASE

In this initial phase of mental activity, students collect the data required to perform mental acts. For the data collection to be successful, one is required to perceive stimuli clearly, in a focused, systematic, and exact way and have an ability to relate systematically to different sources of information and stimuli that reach them at the same time. The student must also possess verbal-receptive tools that enable the processing of the information that is perceived (that occurs during the elaboration phase) and must be oriented in space and time to preserve consistencies, scan stimuli consistently, and develop a level of precision and accuracy in the process of data focusing and gathering.

Deficient Functions at the Input Phase

Blurred and sweeping perception. The student who has a clear and focused perception is capable of relating to all the data in his or her possession, to devote the time that is required to each of the components of the phenomenon or the object in a differential manner, and to distinguish between what is important or insignificant, relevant or irrelevant to the task that has to be performed.

With a student or any person who has not received mediation, perception is unclear and all-encompassing instead of being clear and focused. A person with an unclear perception does not pay distinct and separate attention to every stimulus, but "sweeps" the environment and sees it as if enveloped by a mist. Such an individual is not capable of pinpointing from among the data the characteristics that give them significance.

For example, when we show a student with unclear perception the shape of a rectangle and ask for a description of the details of its composition, these details are not perceived, but not because they are not seen. One's vision may be excellent, but there is no focused attention on the details to activate them. Clear perception is not present, and the person will be unable to identify the shape as a rectangle and to distinguish its components by its characteristics (e.g., four sides, each pair of sides parallel and equal in length, and so forth). These data will be lacking when the student must classify the object, compare it to another object, see to which extent it meets certain criteria, and so forth. An interesting, and not unusual, distortion of perception occurs when students are shown a rectangle that is rotated and oriented to stand on its apex (corner). It is often perceived by certain children as a triangle, because the focus is on the apex, and the angled lines radiating from the corner, which is seen (in a somewhat blurred way) as triangular (see discussion of the conservation of constancies below).

Focused perception develops in the course of a process of mediation. This mediation occurs, as we have already described, in the infant's first days: as one learns to focus one's vision on the face of a permanent object—the mother. The infant attaches his or her gaze on her as much as he or she can and learns every small change in her face. At a certain stage the infant begins to relate to the changes that occur in the mother's face and different events and wonders: "What did I do in order for my mother to laugh?" "What did I do to cause my mother's face to become gloomy?" Infants learn from focusing on the mother's face to focus their gaze on other objects, as well. Children who have no permanent mother-image to focus on find it hard to absorb data and to ascribe consistent significance to them. Studies were conducted by cognitive psychologists J. McV. Hunt and his colleagues describing the lack of focusing and guiding of perception in children raised in orphanages who were deprived of permanent and stable love objects (namely consistent mothering figures).

Impulsive Perception. Students who are random and not systematic in their response to the stimulus world about them, who respond to the first stimulus that they encounter, who jump from one thing to another, and are not capable of performing a systematic process of reflection are manifesting an impulsive perception. This perception can also manifest itself in the difficulty of relating observed phenomena to a particular time and place. Students or individuals who do not know when and where they observed a particular stimulus do not register it in their minds at the time of the event and at the place of its occurrence. In such situations, one lacks the two most important dimensions to define causality: the capacity to locate a stimulus or an event as a reason for an outcome and relate it in time or space to the outcome. We have described the consequence of this deficient function as the lack of systematic searching.

The Lack of the Need for Precision and Accuracy. The general need to be exact develops during the childhood period, following reciprocal activity between children and the people in their environment. There may be cultural differences in the areas in which the need to be exact is stressed. However, from our point of view, there is no particular cultural imperative to this dimension except for the need to be exact in order to gather systematic and accurate information about the world of experience. Children learn that in order to meet with their friends, for example, they need exact details about the time and place of the meeting. We learn through a variety of early experiences that we must be exact in collecting data when we want to compose a full picture from a collection of details, or to see what is the relation between two concepts that we learned—in what way they are alike and in what way they differ. If we are not exact in collecting the data, we shall find it difficult to process them. In any case, the processing will not have the correct significance—or perhaps any significance at all.

Lack of Verbal Labels. The linguistic system—the verbal signs and substitutes of reality—is what enables us to store, remember, and use the data we have perceived. The lack of it—expressed by limitations in naming objects, events, actions, and relations—also causes a lack of ability to distinguish the differences between them and difficulty in encoding and interpreting symbols. Verbal labels enable us to remember, differentiate, and begin to focus and manipulate that which we know

Difficulty of Placing Oneself in Space and Time. The origin of a deficiency in this function lies in the absence of stable systems of reference to time (when things occur) and space (where they occur). Such a deficiency limits the development and use of concepts for describing the relationships and organization of objects and events in space and time. The lack of this awareness and the concepts developed from them harms the person's ability to represent experience, the ability to create associations between objects and events from the standpoint of the direction, the order, the sequence, and the proximity between them. The deficiencies of situations in time adversely affect the ability of human beings to plan in advance, to think hypothetically, and to deal with the future by way of representation. Also the ability to conceptualize relations of cause and effect depends on a person's command of the concepts of time and space.

The Lack of Preservation of Constancies. This deficiency is manifested by difficulty in preserving characteristics of size, shape, quantity, direction, and the like at the time when a change occurs in any trait or characteristic of the object. The failure to preserve constancy means that objects and events have a very episodic and inconsistent perception, and data that are gathered will be very inconsistent and inaccurate.

Inability to Relate to Multiple Sources of Information Simultaneously. At the input phase, the learner often must perceive, register, and organize multiple sources of information. In such situations, one piece of information must be held in mind while other variables are being considered, without losing the initial information. In this way, all the dimensions of the required information are considered and prepared for the needs of processing them. It is impossible to create associations between objects—to sort them, arrange them, put them in order, and make comparisons between them—if one is not capable of perceiving two pieces of information at the same time. A person with a defective function like this tends to relate to one source of information of any kind and tends to ignore the rest. It is difficult to identify a number of individual sources of information and to combine them in order to create a complete picture. Additionally, in a different but related modality of interaction, with such a deficiency it is difficult to grasp the existence of viewpoints that are different from one's own.

THE OUTPUT PHASE

In the output phase of the mental act, the student formulates the results of the elaboration of gathered information (e.g., thinking): After I have reflected, absorbed, processed, combined data and separated, sorted, and classified them, deciphered them—I am then ready to encode my experience (the data) and create in my thinking a way to solve the problem. I must then formulate the outcomes of my thinking in a way that the correct product will be transmitted. I must formulate them so that they will be received, understood, and accepted by the recipients of the product.

The act of formulating an output that will be clear both to me and to others is likely to be a condition of the existence of a mediational process. For example, if I give an unclear answer to a question and it is accepted as it is, there will not be demands made upon me to reformulate or modify my responses at the output phase. If, on the other hand, I experience an environment that demands a product that is understood, acceptable, and of a certain structural and pragmatic level, my functioning will be enhanced and I will be energized and engaged in the larger process of learning and social development—experiencing the transcendent level of human potential.

Deficient Functions at the Output Phase

Egocentric Communication. This communication deficiency derives from the form of the individual's attitude to one's fellow human being, as one who does not constitute a separate entity. The individual who communicates in an egocentric manner does not feel the need to detail all the information needed to understand the message, because it is assumed that the other knows all that he/she knows. One says to oneself: "If I think in this way they also must think in this way. Therefore, I do not need to convince or explain my position." When they ask: "Why?" the answer is "That's how it is," without any need to explain the reply. The essence of this deficiency is the lack of awareness on the part of the communicator that what is being communicated is not understood and a lack of the need to facilitate understanding.

One overcomes egocentric communication when one grasps that there is a process of individuation (see a description of this parameter of MLE in Chapter 7) that makes people diverse and separate entities. They may or may not have the information or experience that I have. When I take it for granted that they already know what I know, I will not make the effort to assure that they understand what I am communicating, and therefore my communication will be egocentric. Thus it is necessary to acquire the tools to produce an output that will be understood, not only by us, but also by others. Paradoxically, individuals who may have good reception and processing abilities sometimes may or may not have the need to communicate, and might find it difficult to formulate things so that they will be understood by others.

Trial and Error Responses. The behavior of trial and error at the output stage is sometimes a reflection of unplanned data collection at the input stage. One who responds in this way does not learn from experience and is not capable of avoiding repeating the same response and the same mistakes. More importantly, this deficiency reflects a lack of structural integration—the solution to a problem has not been internalized and is not generalized to new and different situations. Put plainly, "one does not learn from one's mistakes," and makes the same random responses over and over again.

Impulsive Responding. Individuals react impulsively when the control and filtering mechanisms of the processing activities are not performed sufficiently. Therefore impulsive responses are generally partial and/or mistaken. Similar to trial and error responding, there is a lack of structural (internal) integration, and a lack of systematic use of that which has been learned in problem-solving situations (see our discussion of elaboration phase functions in the next section of this chapter). The consequence is a lack of precision and accuracy in responding.

Blocking of Response. This phenomenon is due to a deficiency in the process of regulatory behavior. It often stems from a sharp and sudden transition from unplanned, unrepressed impulsive behavior to behavior that is over-repressed to such an extent that it causes an inability to respond. It reflects, generally, the lack of suitable processing tools for turning the suppression of the response into a thinking activity. It is best responded to, in terms of the application of mediated learning experience, by applying the mediation of feelings of competence and challenge (see Chapter 7 for an explanation of these parameters). In this way, the mediation moves from a sole focus on the emotional aspects of the blocking to a focus on the cognitive strategies required to overcome it.

THE ELABORATION PHASE

In the elaboration phase of the mental act, stimuli are changed by different thinking operations. We sort out the data that has been collected into groups and analyze, compare, create relationships, encode or decode the meaning, create connections between them and other data, summarize, and draw conclusions. In this way we create information and new data that were not included in or go beyond the initial data that was gathered.

A person's ability to extract from reality what is needed to create new things in the world is imparted by means of the mediator. Belongings, objects, and even experiences do not speak to the person in a language of syllogisms and inferences. It is the person who creates the relationships through performing mental operations. One does not receive from nature objects that are classified or time that is divided according to individual needs. One changes the world through a processing system that is imposed on the world.

The elaboration phase is the most flexible stage in the thinking process, even among populations with very low functioning levels, and it may become more accessible among those who have been defined as severely retarded. This flexibility in the central stage of the thinking process reinforces our basic premise concerning the inherent modifiability of human beings by appropriate levels (in terms of quality, intensity, and so forth) of mediated learning experience (MLE). At times it is easier to teach children to process data than to teach them how to collect data, where and how to reflect on them—as based on accurate reception at the input phase—or how to formulate answers properly—as is required in the output phase.

Behaviors at the input and output phases are not always easy to change. On the other hand, surprisingly, it is precisely the elaboration phase—the central stage of thinking that characterizes human beings—that is easier to change. The input and output functions are the product of behavior patterns that the student has formed, and they are often determined by sensory-motor or physiological characteristics (hearing, vision, articulatory skills, and so on). Many of the behaviors that are considered to be without thinking ability can be, in fact, materially improved when linked to elaboration phase functions, thereby improving the functions and processing abilities that show themselves to be stronger and more efficient than manifested without such elaboration phase linking. One of the functions of a dynamic diagnosis, which we will address in the next chapter, is to assess in which of the stages of thinking does the examinee have difficulty, how mediation at one phase affects the others, and so on. For example, has the student not seen what should have been seen, not thought about it, perhaps not seen or thought correctly about it, or is otherwise incapable of formulating the correct or adequate response to it?

Deficient Functions at the Elaboration Phase

Recognizing and Defining the Existence of a Problem. When a student comes up against a contradiction in comparing a certain phenomenon to standards or to other phenomena (either directly experienced or conceptualized), the experience is one of being thrown off balance. What should occur is a sense of a problem. Defining the problem is the initial action in a process designed to restore balance that becomes impaired, following the lack of conformity between the data that has been registered. This is well illustrated in the biblical story of Moses. Moses saw the burning bush, and yet the burning bush was not consumed by the fire. This phenomenon contradicted what Moses considered to be normal: A bush that burns must turn to ash, the bush that was before him was not consumed, and so he went to investigate why the fire did not destroy the bush. What he saw threw him off balance because it was different from what he expected to see, and therefore he deviated from his path in order to restore the sense of balance that he had lost.

This biblical story presents an apt metaphor for the process of responding to a situation that is contrary to what is "known—what can be considered a sense of disequilibrium. Our description in Chapter 5 of William experiencing a dilemma in the museum (and his mother's mediation) and Piaget's problem of the tilted bottles are examples of responding to cognitive disequilibrium. The academic curriculum presents students with many opportunities to confront similar situations. The teacher who mediates engages students in journeys through content that expand and deepen their understanding of the underlying concepts embedded in the content. Take for example the phenomenon of global warming. Why is there controversy among scientists regarding its impact on the environment? What evidence can be gathered regarding its effects? Is it colder in traditionally warm climates? Are there increasing droughts, changes in ocean currents, and the like? Another example comes from our changing view of the structure of the solar system. Long-held understandings of the planets are being re-evaluated. Why is Pluto no longer considered a planet? What is the new evidence? How was it obtained? If it isn't a planet, what is it?

Defining the problem therefore creates in the person an internal motivation to look for a solution and to explain the contradiction or the gap. To perceive the existence of a problem, we must activate a number of cognitive functions such as creating relations between different sources of information, discerning nonconformity or a contradiction between them, and deducing logical contradictions within the information. Those who lack mediation do not feel the lack of balance created following phenomena that apparently testify to a lack of consistency and contradiction in given information. Therefore, awareness of a problem is not created. For example, there are children who can gaze at a picture of a giraffe with a body of a cow and not notice or differentiate a contradiction between the two animals. If they don't notice differences or contradictions they do not formulate a problem. Their curiosity is not aroused; consequently, they do not need to find any explanation and no elaborations or insights are generated.

The phenomenon of the lack of curiosity in children or adults derives in many cases from the same lack of discerning the existence of the problem. Because they do not recognize that there is a problem, their balance is not disturbed, and therefore they have no need to look for solutions. Thus, there is created in them what we term "lack of curiosity" and what is often referred to as a "lack of motivation." So many modern children who are potentially very intelligent often convey that they are quickly bored because of this lack of discernment leading to a lack of curiosity.

To create change in students, we must give them the tools that will enable them to feel the lack of balance in a problematic situation and subsequently to ask questions and to look for answers according to their ability.

The Inability to Distinguish Between Relevant and Irrelevant Data for the Solution of a Problem. The awareness of the very existence of the problem is, as we have mentioned, a precondition for its solution. Once one knows that a problem exists, one must characterize and analyze it to determine the directions one must look for data to resolve it and to decide what data are relevant to the solution. To distinguish between relevant and irrelevant data the use of hypothetical thinking is required. In this cognitive function, we see the close connection to functions at the input phase, including the systematic scanning of stimuli, placing stimuli in time and space, paying attention to multiple sources of information, and so on.

The Episodic Perception of Reality. Episodic perception is manifested by the lack of an inclination to look for and an inability to discern relationships between events, to collect and organize them, and to summarize them. Every event, item, or object is perceived as a one-time event, unconnected to what preceded it or what will follow it. The student who experiences reality episodically expresses a passive attitude toward it; one cannot understand the organization of the events or put them in order by summarizing them, nor can one experience them as a meaningfully integrated whole. Experience is fragmented and cannot be compared or placed into a wider context. At best, such students experience themselves as recipients of information and not as their creator.

The episodic perception of reality results in the production of an extremely poor repertoire of significant cognitive experiences that build high-order ways of thinking and enables a better use of them. A student with an episodic perception does not create relations between stimuli, events, and experiences but remains passive toward them, and thus is unable to learn from them. One does not say to oneself following the experiences: "This happened to me five times. If I focus together on all five times, apart from the differences between them, I can learn from this that when I do X, Y happens to me." Because every event is a new one without any continuity, one does not summarize or learn from the lessons that will enable the drawing of conclusions, and therefore behavior does not change.

The Lack of Spontaneous Comparative Behavior. A spontaneous search for comparison and difference constitutes a necessary and vital condition for the creation of relationships. A spontaneous comparison supplies a constant stream of associations and distinctions between items of information that are stored in our memory, following an encounter with stimuli. Spontaneous comparison is one of the foundation stones of higher-order mental processes.

We stress the spontaneity of the comparison, because those who lack mediation may well be capable of comparing when they are required to or have an internalized need to do so. For example, if children who do not compare are allowed to choose one slice out of two slices of cake, they will compare them in order to receive the bigger slice. This suggests that the mental function of comparison exists and is even activated (under conditions of an internalized need system, but they may not be systematically activated and generalized to the wider world of stimulus responsiveness. That is, the student who is capable of making a comparison between two slices of cake may not necessarily compare two events, two figures, or even two numbers. Thus, the deficiency does not prevent the use of the function but limits it significantly.

A Narrow Mental Field. Complex mental activities demand dealing simultaneously with items of information, some of which we receive from the outside and some of which we must retrieve from memory. Among people with a narrow mental field, the metaphor of the short blanket phenomena applies: when it covers the head, the feet are exposed and vice versa. That is to say, a new item of information that enters the storehouse of memory causes the forgetting of an item of information that was previously learned. This deficient functioning is also connected, like its predecessor, to a person's passive approach to the information. A person who has not been given mediation sees oneself as receiving and transferring information, but not as the creator and the re-constructor of information. There is no belief in the ability to pull out information from memory in a voluntary manner; one does not even remember it in an immediate and spontaneous manner. This deficient function can also be described as a lack of peripheral awareness; one is not aware of aspects of experience that are away from the center of focus and on the edges of what one perceives.

The Lack of Planning Behavior. To plan means to refer to the future and to actions that will be performed in a distant time and place. Deficiencies in planning behavior are liable to be connected to life circumstances—to a reality in which the individual lives from hand to mouth, feels bereft of influence over his or her fate, and therefore does not find any point in planning for the future. Many students with whom we have worked, and who have experienced extreme cultural deprivation or severe disruptions in their lives, as those who survived the Holocaust, often experience an inability to plan ahead and project into the future because of their previous focus on struggling to survive in the immediate here and now, as well as the anxiety and stress that is conjured up when thinking about the future and the lack of models or encouragement to think ahead. The lack of planning also keeps behavioral responses episodic and restricts the development of a wider mental field of awareness.

Lack of Summative Behavior. This is another frequent characteristic of children who have not been given mediation. The child with this cognitive deficiency relates to everything as a separate item or event and does not aggregate them into a unified group or sum them up into an understandable and coalesced phenomenon. This also contributes to an episodic perception

of the world. If we were to ask such children how many brothers or sisters they have, they must count them one by one. They do not group separate units into a whole because they have never been asked for ou experienced the process of summarization. Cognitively, such situations demonstrate that the whole is truly more than the sum of its parts. When we do not sum up our experience we do not appreciate the holistic nature of our lives.

The Inability to Project Virtual Relationships. As a consequence of a lack of internalization of experience, individuals cannot project to new situations and experiences that do not directly exist in their immediate exposure. Higher-order mental operations and the experience of distancing oneself from immediate and direct experience rely on virtual relationships as an elaboration of direct experience and become an important aspect of perceiving the complexity of the world of stimuli. For example, looking at a picture and projecting actions and feelings stimulated by elements of the picture, such as a ferocious lion devouring its prey, enables the learner to project to other situations like concepts of the food chain and then generalize from this concept to other situations and applications, some of which are far removed from the modality of the direct experience.

Difficulties in Interiorizing. In our description above of virtual relationships, we used the word *project* to indicate the mechanism for forming relationships among objects and events and the need to form inner mental pictures of experiences (the stimulus objects and events). This results in the forming of mental images and representations of that which is experienced. Another term useful to convey this mental act is to transfer to our mind that which we experience through a mechanism of representation. Events, perceptions, and experiences are interiorized through a process of representing them (forming mental pictures, attributing conceptual aspects that link them to one another, and the like), and they become an inseparable part of the cognitive-emotive structure of the person. This is what is meant by interiorization.

Those who have deficient functions in this area are generally limited in their ability to use the principles that were drawn from their experience of learning because they do not form inner pictures or models of what they have learned. Although this difficulty may appear to derive from deficiency of memory, it derives as much from the difficulty of internalizing stimuli. When interiorizing has not taken place, the student needs tangible hints and cannot rely on the information stored in memory. A child who finds it hard to interiorize generally finds it hard to reject or postpone gratification. These difficulties characterize children who have not had access to MLE.

The Lack of Need to Justify Solutions or Responses. The data we have collected at the input phase need to be processed and formulated so that they will be used in arriving at a solution to the problem. An important part of the elaboration phase is for the individual to understand why and how conclusions were reached and to be able to understand the nature of the process of elaboration and problem solving, ultimately conveying to others his or her understanding. In order to be understood by others, the learner must process things so that they will be convincing to him- or herself. Therefore, one must be prepared to give reasons for arguments and feel the need to rationally prove how and why responses were generated.

This need is stimulated as an outcome of mediated learning experience, when the mediator is not satisfied with the student's reply and requires that the learner give reasons for solutions, conclusions, and the processes used to arrive at them. In this sense, this cognitive function is closely related and is a transitional function leading to the output phase. In addressing this cognitive deficiency, the mediator interposes him- or herself between the individual, emphasizing the need to communicate to others and mediating the need to adapt the formulation of solutions so that they will not only be self-understood but be meaningful to others (leading to output phase functions).

THE RELATIONSHIP OF DEFICIENT COGNITIVE FUNCTIONS TO MLE

A student with deficient or defective functions—particularly in the stage of elaboration (processing), but also in other stages—tends to be passive. The student is prepared to carry out the reproduction of the known data but is not prepared to create new information. That is to say, we're not only talking about an intellectual problem, but also about a passive attitude to reality. This kind of passivity sometimes derives from the self-perception as lacking the ability to create information. In such cases the person can only transfer the information that is possessed but not go beyond it.

The three phases of the cognitive activity are not separated but influence one another: the mechanism of the processing is that which dictates to the input stage how, what, and how much to invest in the precise collection of data; similarly, the elaboration phase is influenced by the data that is collected and perceived at the input (reception) phase.

One of the unique components of our perception is the ability to pay attention not only to the outcome but—and perhaps primarily—to the whole thinking process. We do not take the outcomes of an activity as a sole criterion for evaluating performance, but we also consider the process through which the learner arrived at the outcomes.

We can summarize the effect of MLE as providing a whole system of responses in the three phases of the mental act. At the input phase, the mediator imparts to the learner the ability to grasp the data that is required to function in a sharp and comprehensive manner, search for the data systematically, relate to as many sources of information as possible, and use them before conclusions are drawn.

At the elaboration phase, the mediator gives the learner thinking tools that are required to derive benefit from exposure to stimuli. The mediator provides the learner with tools for formulating the problem and may complicate the problem to create the need to add data and to think a little more before reaching a conclusion. The mediator directs the learner to carry out comparative processes and to give rational reasons for his or her conclusions.

At the output phase, the mediator creates in the learner interactive forms of thinking that are completely different from those that would be required if the mediatee did not interact with others. When a person speaks only to him- or herself, or when one is in a dream situation in which the laws of logic have no meaning, there is no need to be interactive. But the need for logic in relating to limits of time and space, the need to summarize things, and the need to classify and arrange them in order are all created because a person is a creature who lives in a society and receives experience through a mediational interaction that is unique to human beings.

MLE is responsible, therefore, for the emergence of the mental operations that enable a student to function efficiently from not only a cognitive standpoint but also from an emotional/energetic perspective, and to communicate with others within the immediate cultural community and beyond. On the other hand, a lack of MLE leads to limitations in social and cultural interaction and causes the appearance of deficient cognitive functions.

We must again stress that we're not talking about an irreversible situation. Exposure to mediation can correct the deficient functions that have been formed because of the absence of previous mediation and modify them significantly.

As an example, we will conclude this chapter by describing a student with whom we worked who presented impulsive behavior that manifested itself by the lack of readiness or inclination to restrain her reactions so that her cognitive development and behavior was significantly impaired, but who responded to MLE.

> Donna was referred to us at the age of 14 with a diagnosis of ADHD. Her failure at school due to a lack of attention and incapacity to restrain her impulsive behavior led to her dropping out of school and associating with other problematic peers who were also academically nonperforming. Her behavior had deteriorated to the point where she was in danger of being at high risk of drug addiction and of preventing the development of academic skills and social relationships. Donna was rebellious and unwilling to accept any discipline imposed on her. She had failed many forms of treatment—both psychological and medical. Mediation for her consisted of the presentation of many tasks (using the Instrumental

> Enrichment program) that required her full attention, the coordination of her mental activity, and a persistent search for solutions. At the outset, her responses indicated an absence of the characteristics of ADHD and the ready availability of processes for addressing the tasks and responding appropriately. Donna had many well-established cognitive functions, and those that were fragile or deficient were amenable to mediation through the use of the instruments and a general MLE interaction. She became engaged and involved, began to see herself as competent and able to control her behavior, and became enthusiastic about making changes and seeking more appropriate goals for herself. All of this was reinforced by mediation. Most importantly, Donna was able to observe for herself the available and newly acquired cognitive functions and transfer them outward to her parents, school experiences, and peer relationships.

The mediation of cognitive functions in this case illustrates how the focus on a systematic, positive, and active intervention can modify behavior in significant and sustaining ways. Parents and teachers often attribute such results to "a miracle." Our response is that such changes may truly appear miraculous but are in fact the product.of hard work and the use of well-defined and provided interventions—what we have called "man-made miracles."

CHAPTER 10

Dynamic Cognitive Assessment

Earlier in this book we discussed how the theory and concepts of structural cognitive modifiability have been used to develop applications to produce changes. We have now reached a stage in which we must consider a number of practical questions arising from the theory of structural cognitive modifiability (SCM):

1. If a human being is indeed a modifiable creature, as this theory assumes, what is the significance of the conventional and traditional diagnoses using instruments and techniques that are designed to characterize the presumed fixed and unchanging nature of intellectual and cognitive functioning? Given this perspective, can one use them to accurately predict the future development of the individual?
2. If human beings, as they are today, are in fact not the final word and are modifiable, by what means will we be able to bring about change?
3. What are the implications of this modifiability for students as beings who must change not only to the environment, but also for themselves, as they must adapt to new and challenging situations?

We have answered these questions through the development and application of three applied systems that are derived from our theory:

- The first method is that of a dynamic assessment of cognitive functioning and learning potential, the Learning Propensity Assessment Device (LPAD)—a battery of instruments and method of application that focus on the assessment of a human being's modifiability.
- The second method is the Feuerstein Instrumental Enrichment (FIE) program—an instructional curriculum based on a careful delineation of necessary cognitive skills and functions and the incorporation of mediated learning experience methods.
- The third is an application of the Shaping of Mediating Environments (SME). This approach focuses on creating and sustaining the conditions that enable cognitive modifiability to be fulfilled. SME focuses on the creation of an environment that not only facilitates change, but also arouses it.