

Movement as a Model of Learning

It has always been my dream to introduce the Feldenkrais method to the schools—not merely as an adjunct to the physical education curriculum, but as a subject in its own right. Approached as a full-fledged area of study in the main curriculum, the Feldenkrais method can create conditions that will prepare children for learning and, indeed, for life.

ORGANIC LEARNING THROUGH ACTION

Education in the school system provides the child with teaching—but not necessarily with the ability to learn. One crucial key to the learning process is action.

Feldenkrais defines the process of “organic learning” in terms of action, beginning in infancy: The infant relates to environmental stimuli through a series of actions which progress by trial and error. Feldenkrais extends this notion into later years, claiming that action by trial and error continues to form the basis of “organic learning.” Thus, the process of searching for suitable modes of action is inherent to the process of learning [Feldenkrais, 1949, pp. 36-40].

Reed and Gibson define “action” in a similar context: Reed states that an action is any body displacement necessary to coordinate another action and achieve spatial orientation [Reed, 1991]. Gibson defines action as a displacement of body parts for the fulfillment of a certain need [Gibson, 1966].

PHYLOGENETIC AND ONTOGENETIC DEVELOPMENT

Also crucial to the learning process are two aspects of human development known as phylogenetic (evolution-based) and ontogenetic (individual-based). Phylogenetic development is rooted in the scheme of human evolution, which is identical in all human beings. Ontogenetic development is the manifest process by which an individual realizes the underlying phylo-

project was carried out with the participation and cooperation of a local group of assistants, who helped design tests for the children and performed the ongoing follow-up. The assistants also documented all phases of the project in writing and on videotape.

The project lasted seven months, from January through July, 1991. Interspersed within the course of those seven months were three periods in which I actively participated—one lasting four weeks and two lasting one week each. The children's teacher was present at all lessons, followed the learning process and took notes. She continued to conduct the lessons in between the three above-mentioned periods. The local assistants aided the teacher and observed and recorded developments. At the beginning and end of the project, both groups were tested on stability, flexibility, orientation (in relation to themselves and to their surroundings), static equilibrium, coordination, self-image (drawing of a human figure), level of intelligence and self-expression.

METHODOLOGY

Group and Individual Lessons

Two types of lessons were presented in the course of the project:

GROUP LESSONS—In these lessons, entitled "Awareness Through Movement" (ATM), the teacher gave verbal instructions with no demonstration of the requested behavior. Pupils carried out these instructions, while at the same time tuning in to their inner sensations and feelings. In other words, they were asked to transfer the verbal instructions (involvement of cognition) into motor actions.

INDIVIDUAL LESSONS—These lessons, entitled "Functional Integration" (FI), were mainly nonverbal and based on touch. Senso-motoric stimulation was thereby achieved.

The Notion of "Basic Functions"

Both the group and the individual lessons concentrated on the notion of basic functions taken from the repertoire of our daily life. Among the basic functions included in the lessons were the following:

ORIENTATION—A child can sit up, stand, turn around or draw, yet lack a sense of orientation in these activities. Focusing upon the child's orientation to himself/herself and to the objects that surround him/her will improve the child's performance and, by extension, his/her cognitive and physical activity. Since orientation is a vital component in any functional activity, it was the subject of the first lesson.

DEVELOPMENTAL AND BEHAVIORAL FUNCTIONS—These include daily functions based on development and behavior, such as crawling, standing, sitting, walking, jumping, stretching, rotating, rolling, dragging and talking.

CORTICAL FUNCTIONS—These functions, closely tied to consciousness and awareness, include logical analysis, judgment, mathematical proficiency, language, memory, fantasy and the synthesis of the complete range of feelings and their expressions. The human nervous system tends to organize itself toward optimal functioning; in other words, it selects the most efficient functional possibility given the information available, especially when that function is accompanied by pleasure and satisfactory feedback.

Thus, the act of introducing the entire neuro-sensomotoric scope reorganizes the entire system. Since the brain tends to adopt the most efficient possible mode of integration, the improved ability is extended to the repertoire of movement and behavior.

The choice of a particular function during a given lesson is made on the basis of the inner needs of the child or the class during that period of time.

In the course of a lesson, a movement or function is divided into the elements which compose it. This detailed analysis enables the child to experience a new kind of integration. The child learns to be attentive to every phase of the movement and to exercise each detail without excess strain or parasitic movements. Auxiliary tools and games connected to the function at hand are utilized.

“Before and After” Comparison

At the end of the lesson, the child repeats the initial process. This provides the opportunity for an important aspect of learning—namely, the possibility of comparing the initial and final processes and discovering the difference (hopefully, an improvement in performance) between the two. Sometimes, a function that could not be performed at all at the beginning of the lesson is performed successfully at the end.

Awareness

A crucial element in the process of learning a new function is the attainment of awareness through development of the senses. Included in this awareness is the ability to discern the way in which the function at hand is performed. Thus, the learning process is one of personal growth. Its importance lies within the fact that it can be realized only through awareness and coincidence, and not by mechanical drill.

What is awareness? It is that part of thought which listens to myself while I act. In the course of the development of consciousness, there is an element of orientation. Therefore, the expansion of consciousness demands an expansion of orientation [Katzir, 1978].

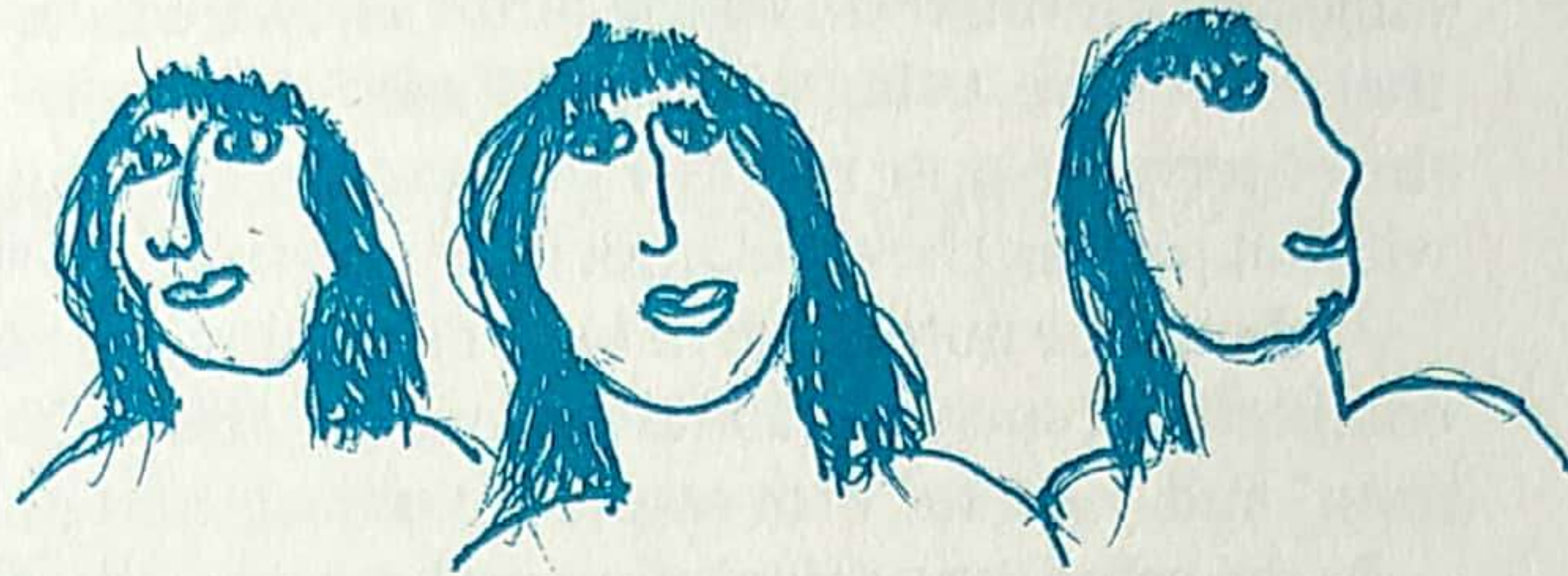
THE LESSON

Any educational method which deals with overcoming a child's disabilities, actually focuses upon those disabilities rather than upon positive capabilities. The Feldenkrais lesson is built upon the presentation of assignments that enable the discovery of capabilities, rather than on struggling against disabilities. Emphasis is placed on finding ways of discovering these capabilities in any situation and in the face of any limitation.

For all children, but particularly for those with low self-esteem and concentration problems, assignments must be constructed in such a way as to enable the child to find a way of taking part without fostering a feeling of limitation or frustration. This challenge is best addressed by the individual teacher's ingenuity and personal guidance.

The themes of each lesson are taken from the repertoire of actions which are familiar and essential to the child. In the course of the lesson, these actions acquire new meanings. In this way, the learning process becomes a search for solutions, rather than a process of struggling with difficulties and frustrations or of simply imitating the teacher's demonstration.

The process of solving a motor problem cannot be mastered through rote imitation of others, but only by self-experience and self-discovery. The strengthening and enhancement of this learning process, achieved in phases through communication with oneself and with others, enables the child to integrate development in a broad range of aspects, including capabilities, self-image, verbal expression and response to positive feedback.



THEMES

The project included the following themes and subjects:

- Orientation and Self-Image
- Hand-Foot Connection
- Flexion
- Extension
- Breathing
- Preparation for Jumping
- Articulation and Awareness of the Organs of Speech (Lips, Teeth, Tongue)
- Forming a Bridge
- Headstand
- Fine Motorics with Newspapers

For the purposes of this paper, I have selected two themes, "Orientation and Self-Image" and "Hand-Foot Connection," as examples of how movement can be an avenue to learning.

THEME 1—ORIENTATION AND SELF-IMAGE

Initial Self-Orientation

Orientation is a vital component in any functional activity. To observe pupils' initial orientation, sheets of paper were handed out and the children asked to draw a person. If the children requested additional input ("What kind of person?"), they were told "Draw what you see when you think of a person."*

Clearly, each child's picture is a representation of his or her own self-image. Upon initial observation, signs of difficulties in self-orientation could be detected.

*These drawings do not appear in this article.

Orientation to One's Surroundings

An example of assignments aimed at orientation to one's surroundings is the following instruction, which relates to one's own body parts and their relation to surrounding objects: "Walk two steps away from the chair and come back to the chair. Put your elbows on the back of the chair, followed by your chin and forehead."

This is an unconventional learning format. It evokes curiosity about how one performs, using trial and error as well as repetition sequences.

In another example, the children are asked to place one hand on the table and the other *under* the table. They are then asked to establish where their hands are, using the terms "right" and "left." Their reactions enable the observer to note whether they indeed distinguish between right and left, without placing the child under the pressure of being tested.

It should be noted that in both examples, the object is for the child to comprehend such relational notions as "above," "below," "upon," "away from" and "next to" with respect to objects and oneself.

In the same way, orientation with relation to one's surroundings can be perceived and improved through playful games. The child is asked to stand in front of another child, but instead stands next to him. The differences in orientation can then be explained through observation and self-experience, rather than through correction. In this way, the child's repertoire of spatial concepts ("down," "up," "next to," etc.) can be expanded. An added benefit of this setting is that the traditional classroom becomes an open space, the internal organization of which is the children's responsibility. This becomes an inherent part of the lesson.

Remarks

Two additional points are worthy of mention in the context of Orientation. The first relates to the ability to enjoy playtime, characterized at school by the recess periods. The child's ability to enjoy the recesses is one of the most important elements in the development of playful and social concepts. A lack of communication capability during play (e.g., during the recesses) can lead to social setbacks. For this reason, games are practiced with the children in the framework of the lesson, which can later be utilized during the recess.

The second point regards natural tensions and shyness usually encountered in the classroom between boys and girls. We have noted that the physical contact intrinsic to the Feldenkrais method is instrumental in removing barriers between the sexes.

THEME 2—HAND-FOOT CONNECTION

I chose to include this subject in my project because the function of hand-foot connection is part of the primary repertoire of infant development. Because this function is so basic to the development of the child, I saw great importance in reorganizing it in the child at an advanced age and in recreating this aspect of the child's development scheme, as it were, in a more complex setting.

The act of grasping the foot with the hand, and the way in which it is held, aid in developing the functions of grasping and holding, which are the basis for later phases like holding a pen and writing.

Yet another functional dimension is added in this context by the inclusion of assignments in the lesson which involve the visual act.

It should be noted that all of the instructions given in the course of the lesson are deliberately verbal, without demonstration, in order to stimulate the children's cognitive activity of translating the verbal instructions into action. This kind of thinking—the process of grasping what is going on while engaged in action—is the essence of awareness and consciousness. Thus, enabling the child to interpret verbal instructions in the context of these lessons furthers the development of awareness and consciousness while at the same time placing an emphasis on orientation.

The following section presents a closer look at some instructions and other activities performed in the course of the lesson, along with a discussion of the principles and intentions which underlie them.

[Note to the reader: Underlying principles of each sequence appear in italics.]

Lesson—Part A

The children sit on mattresses.

- 1 Please hold your right foot with your right hand, and stretch and bend them slowly. Take care not to stretch your foot too far. Pay attention to how you are holding your foot. Make sure there is no unnecessary effort.

As you bend and straighten your foot, try to find other directions in which to move it, at different heights. (Try to find different combinations of bending and straightening.)

Besides developing awareness and consciousness through the interpretation and fulfillment of verbal instructions (see above), these exercises develop eye contact, orientation, sensory awareness, and sensitivity to the amount of effort required. In addition, the children come to learn that the way in which the action is carried out comprises the essential content of that action

- 2 Lie on your back. Hold your right foot with your right hand. Bend and straighten them a few times.

Performing movement while holding the foot with the hand demands the participation of flexors and extensors—a dialogue, as it were, between the agonist and the antagonist.

In which position is it easier to make the same movement?

Is there a difference between the two positions?

In the course of the conversation it becomes clear that it is easier to perform the movement lying down. This creates an opportunity for the teacher to explain the reasons for this to the children.

The strategy of posing questions to the children, allowing them to express their sensations and thoughts, and presenting “live” examples, enables the child to draw a connection between the movement and other aspects of life.

In the learning process, I use the posing of questions as a strategy to arouse the thinking process, and not necessarily as a search for answers.

Lie on your back and rest.

Children are encouraged to be attentive to the way in which they lie down, to the contact of the various body parts with the floor, and to the way in which they breathe (through the mouth or nose).

3 Please sit up. Hold your left foot with your right hand. Slowly bend and extend your arm and leg.

Holding the foot with the opposite hand means crossing the median line. Performing movement while crossing this line requires the participation of additional elements, such as equilibrium and head-trunk coordination.

The chronological order in which this function is worked upon is analogous to the organic development in the first years of life. The goal is to learn concepts which in due time will be integrated into all aspects of life.

4 The children perform the same movement as in number 3, but this time lying on their backs.

5 Again, please hold your foot with your hand in the crossed position. Now search for different ways of moving in any position, but do not release your foot.

Here, the element of creativity was added, along with the full range of possibilities which enable each individual to search for, find, and express his or her own potential—i.e., the known and the unknown that reside within him or her. It was interesting—both for the teacher and for the pupils—to note the broad range of improvisations that resulted.

“Motor skill is not a movement formula, and certainly not a formula of permanent muscle forces imprinted in some motor center. Motor skill is an ability to learn to solve one or another type of motor problem” [Bernstein]. In other words, motor ability is defined on an ecological basis, as an ability of the organism to deal with environmental changes when faced with a motor problem, and to learn to solve the problem in accordance with these changes.

Now lie on your back and rest.

To what extent does the body lie differently?

Has breathing become easier?

Self-observation

Lesson—Part B

BACKGROUND—The ball is an important instrument for the development of basic elements of mobility and social behavior in children. Modern leisure activities like video and computer games tend increasingly to replace games involving movement, which help to develop hand-eye connection, coordination, orientation, equilibrium, communication, and other crucial capacities. The lack of movement-oriented games to stimulate these abilities becomes all the more crucial in light of the fact that children with learning disabilities suffer from a lack of precisely these elements.

Working and playing with balls gives these children an opportunity for sensual development and for joy in their personal capabilities. Like anything that provokes joy and stimulates one's capabilities, ball games enter the repertoire of leisure time. For these reasons, I introduced the ball as a means of furthering and developing the functions and capacities discussed above.

OBSERVATIONS

One recurring phenomenon was that when the movement was difficult to perform, there were changes in the position of the mouth, and children tended to hold their breath. The children were consequently instructed to pay attention to their breathing (in order not to stop it) and to the lips (in order not to tighten them).



1 Please sit down on the floor. Now take the ball and roll it around on the floor with your hands. Now take the ball and roll it around on the floor with your feet.

In these two cases, the very performance of the instruction entails the formation of connections between hand and eye and between foot and eye. This demands concentration and consequently develops it.

Try to pass the ball from your foot to your hand and back again. Look for ways to move the ball without dropping it.

This assignment helps to develop sensitivity and demands more sensitive movements of the trunk. It also requires creativity with all of its implications.

Lean on your hands on the floor and move the ball back and forth between your feet. Try to throw and catch the ball with your feet. The feet develop dexterity.

Throw the ball with your hands and catch it with your feet. Now throw it with your feet and catch it with your hands.

The ball is an environmental stimulus ("affordance")—a representation of our surroundings, created artificially by the teacher.

"Ecological psychology states that the world is one of choices. Our awareness, which enables us to perceive the affordances in our environment, is 'specific', in the functional sense" [Reed, 1991].

The task posed by the teacher consists of a set of motor problems, which the child must learn to solve. Our approach states that an action is not merely the displacement of body parts in space, it is displacement aimed at "satisfying a certain need" [Edelman, 1992].

"Therefore, orientation of the body is its primary organizational factor, and only after that comes the posture, which serves a certain orientation. The neurosystem of the various postures is dynamic, and that is a radical thing" [Gibson, 1966, 1986].

2 The children perform the same exercise as in Lesson Part A number 1: The children, seated, hold one foot in their hand, and stretch and bend them slowly.

Since the movement is already familiar, attention can be turned to new details and a new awareness. New variations can be added, such as:



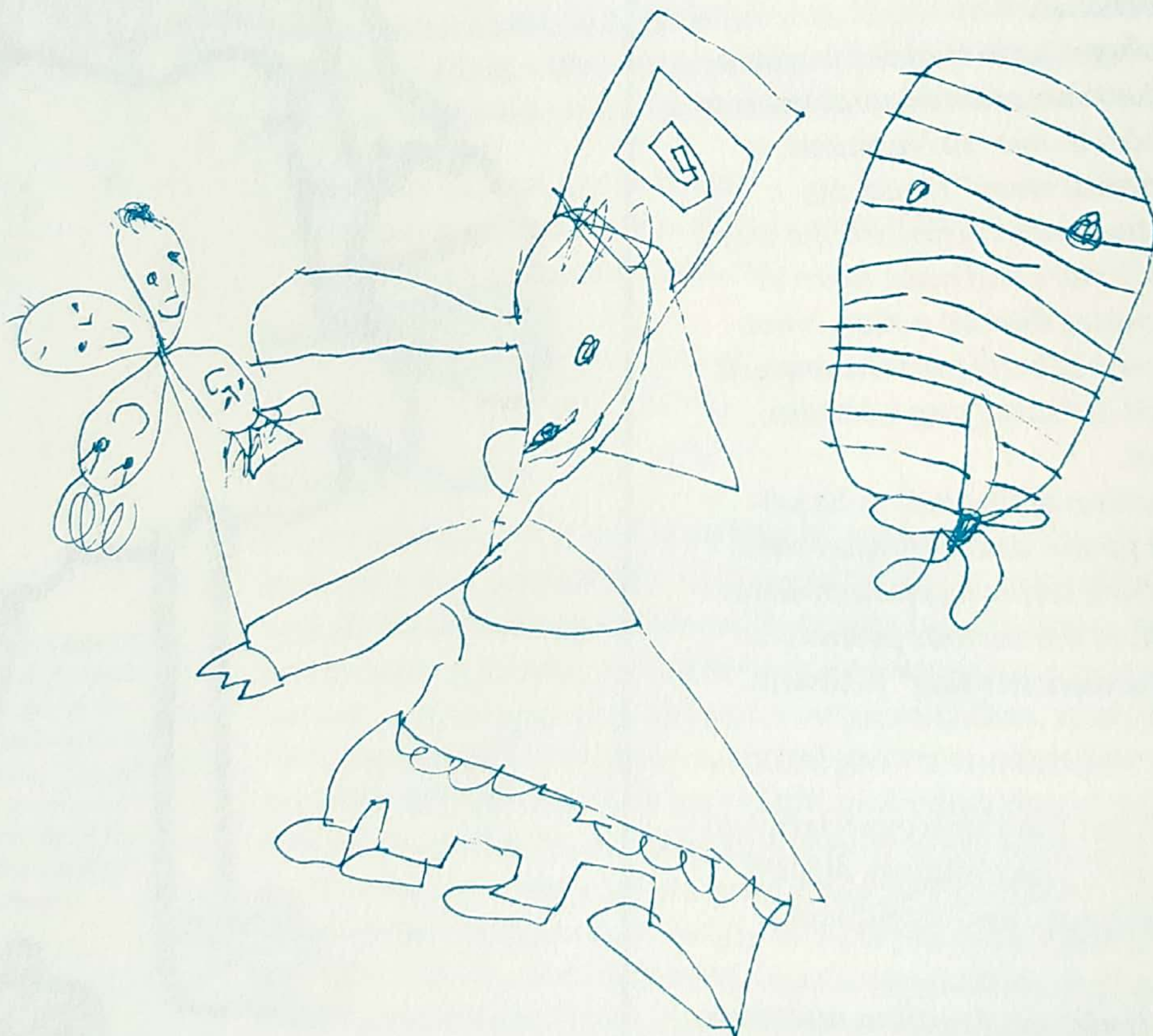
Holding all five toes. Differentiating among qualities of movement and degrees of ease of movement.

A variation on the original movement: moving the knee in front of the elbow and behind it.

This introduces the phases of orientation among the various body parts.

3 The children perform the same exercise as in Lesson Part A number 1, this time lying on their backs. Attention is turned to the difference in degree of ease of movement between the sitting and lying positions and to the realization that the differences have decreased in comparison with the difference between numbers 1 and 2 of Part A.

In this context, awareness is the focusing of attention upon the details of the movement sequences which were verbally directed by the teacher. Throughout the lesson, the teacher guides the child in such a way as to enable the moving limbs to be observed kinesthetically, in relation to one another and to the core organization of the body as a whole. Becoming aware of the structure of one's bodily organization allows one to choose to open oneself to change.



BEFORE AND AFTER— SOME BRIEF CASE HISTORIES

Huriye

Huriye is a 12-year-old girl from a household of low socio-economic status and traditional Turkish background. Diagnosed as deaf and dumb, she was totally uncommunicative at first. She was present at the lessons, but it was impossible to know whether she even understood the contents. In the course of the project her initial condition gradually improved, albeit in small steps. She participated increasingly in the lessons, culminating in her present state of openness and awareness. From lip movement and slight use of voice she advanced all the way to speech at the conclusion of the project. Her entire state of being, social acceptance, and learning capacity progressed remarkably.

Andreas

Andreas, a 9-year-old-boy, had been hospitalized for long stretches of time, so that he entered school at a late age. He suffered from basic motor dysfunction and anxieties filled with images of hospitals and ambulances. His dysfunction was recognizable by his wide stance, speech difficulties, poor balance, slight rotation and rigid dragging of his feet. At the end of the project we observed an improvement in his motor functions, clearer speech, and a lighter walk. His drawings and speech had become totally free of expressions of his earlier hospital-related anxieties.

Christian

Christian, who suffers from cerebral palsy, entered the project with motor and social difficulties. He had to lean against a wall in order to find proper balance, his rotation was performed mainly with his head to compensate for the lack of full motion. By the end of the project, he had gained the ability to stand by himself and acquired self-confidence, courage and enjoyment of movement, which improved his ability to communicate and play with other children. He had learned to use alternative options to live with his CP.

RESULTS

The results of tests performed on both groups (control and experimental) at the beginning and end of the project were compared. Specific improvement was found to have occurred in all children in the experimental group with regard to the following elements:

POSTURE—Use of the potential of upright posture, lively expression in the eyes, and a drop in general tension.

STATIC EQUILIBRIUM

COORDINATION

FLEXIBILITY

ROTATION

ORIENTATION—in relation to oneself and to one's surroundings.

The following specific changes in posture were noted:

The head was positioned above the vertical line, and the right and left sides were more balanced.

Kypholordosis became more balanced.

Clear and full positioning of the feet.

More balanced walking.

The body's center of gravity moved closer to the center of the body.

The sitting position became more upright.

The hands acquired more importance and presence.

In the test of self-image (drawing a human figure), considerable improvement occurred in the perception and organization of space, as well as in the placement, details and colors of the figure. There was also a clear and evident correlation between the improvement in self-image and the development of self-expression in movement. There was also a direct correlation between the extent of learning disability and that of equilibrium disorders.

It was found that in the control group (which had received no lessons at all), there was no improvement in most of the tests. On the contrary, there was even a salient worsening in all elements of stability and equilibrium.

DISCUSSION AND CONCLUSION

The pupils of the first grade classes at the Fröbel school in Cologne, Germany, who comprised both the experimental and control groups, suffered from learning disabilities. At the beginning of the research project it became clear that these learning disabilities were accompanied by motor problems—including problems of stability, equilibrium and orientation—as well as low self-image. All of these problems are interconnected, all influence and complement each other, and all build the personality of the child.

When a defect or halting of some kind exists during motor, sensory or emotional development, there is the possibility that it might trickle into the child's personality and become an inseparable part of it.

The lessons given to the children in the experimental group during the seven months of research addressed the basic functions that lacked organization and led to considerable improvement in all of them.

The children in the school were exposed not only to academic studies, but also to a social life that included communication and emotional expressions. Although the element of learning was not tested in the framework of this project, parts of the cognitive, psychomotoric, social and emotional elements which influence learning improved: fine motorics, the ability to concentrate, curiosity, spatial vision, capability of verbal expression, human relationships, patience and tolerance, pleasure in action and supportive recognition of action. It should be noted that the children enjoyed and loved the lessons very much and participated throughout the project.

According to the reports of the class teacher, there was an improvement in the social structure of the class. It seems that the improvement of movement and self-image influenced the human relationships among the pupils themselves and between them and the teacher. As mentioned above, the lessons that were given to the children helped them to develop mutual assistance, patience with themselves and tolerance towards others.

In contrast to the improvement that took place in the experimental group, a change for the worse occurred among the children of the control group. This fact is surprising, and there are no clear explanations. It can

only be assumed that as a result of the physical development and negative feedback the children received from their bodies and their surroundings (school, family, friends, etc.), a setback occurred in those same areas which improved in the experimental group.

In general, the grave phenomenon of defective posture appears in many children at an early age, even in "normal" classes, and these defects usually influence self-image. They are sometimes joined by learning disabilities, as was the case among the subjects of this research project.

When teachers or others attempt to improve the child's situation by emphasizing his or her disability, the child receives negative feedback from himself and his surroundings. The working process, as was demonstrated in the project, must be based on discovering the phase in which the function stopped, and returning to that phase by searching and emphasizing capabilities rather than disabilities. This is a starting point. The possibility of consciously returning to the organic development suitable to the child's age makes possible a new integration of elements and enables the child to utilize his or her capabilities and develop his or her personality.

A visit to the class three years later revealed the following findings:

The children liked going to school and demonstrated curiosity and a desire to learn.

The social atmosphere was on a high level. New children who had been problematic in other schools were quickly integrated by the veteran children of the class.

The children showed a higher level of concentration during lessons.

Although they had reached puberty, the level of aggression was relatively low.

This class, which in 1991 had been one of the more problematic ones with regard to learning ability and social background, had now become one of the most advanced classes in the school and the favorite class of its teachers.

The control group showed no development in its social structure, learning ability, etc., in comparison to its state in 1991.

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