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THE DEVELOPMENT OF PSYCHIC FUNCTIONS WITH STRESS ON LEARNING ABILITIES DURING PRESCHOOL YEARS LEARNING DISABILITIES PREVENTION – THE CHARACTERISTICS OF THE COMPLEX KINDERGARTEN EDUCATIONAL PROGRAMME

In memoriam Katalin Porkoláb-Balogh

Children's psychic abilities are of utmost importance when reaching school age. These abilities depend on the development of perceptual and perceptuo-motor functions, which determine learning abilities. Although the sensitive stage for the optimal development of these functions falls between the ages of 3 and 6, the backwardness in certain functions and their developmental heterogeneities can be compensated for in the initial phase of the lower grades.

CHARACTERISTICS OF DEVELOPMENT

The concept of 'growth' is usually used to refer to physical growth, which forms the basis for behaviour changes.

The term 'maturation' refers to a genetically determined sequence of physical growth changes that influences the development of behaviour in an orderly way, and is relatively independent of learning or experience. It provides a 'readiness to learn' certain skills at a particular time.

Distinguishing features of behaviours based on maturation are relatively fixed sequences of events, such as the sequence of gross motor development in the first year of child's life, e.g. sitting, crawling, standing, then walking.

There is a sequence of development within each developmental field. These are: motor (or gross and fine), communication, self-help, adaptive (or intellectual) and social-emotional. Development in one field does not necessarily run parallel with development in another. For example, a child with cerebral palsy may be late in walking but average in manipulating objects and intellectual development. The rate of development is not

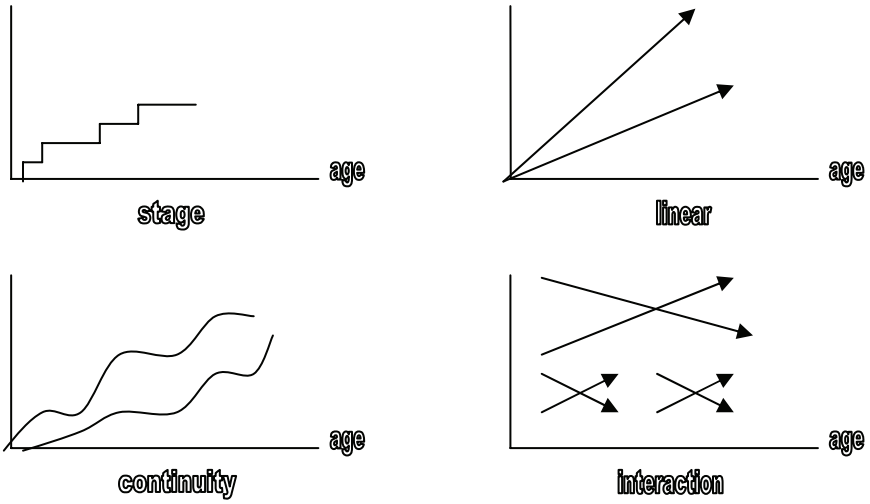
constant. Sometimes there is an overall slowing down of development across all domains, which results in abnormal functioning.

There are other principles of development shown in the regular ways in which physical and psychological competencies change from simple to more complex behaviours. The first principle is that behaviour becomes increasingly controlled with age.

Conceptual models of development:

1. The 'Stage model' views development as occurring in step-like growth, discontinuous stages, each of which is qualitatively different from earlier ones. They follow a particular order, which is universal for all children.
2. –3. The 'linear' and 'continuity models' both view development as constituting incremental growth. The Continuity approach sees the increments as being more variable over time, reflecting growth at different rates at different ages. Developmental changes are primarily genetically programmed and directed by processes of maturation.
4. The 'interaction model' views development as the product of individual characteristics interacting with environmental influences. The factors in the individual and environmental development, and the ways in which they reciprocally influence each other may well differ at different points in the age of a child.

Table 1.



On the basis of Janet Empson and Dabie Nabuzoka (2004).

All models conceptualise developmental changes as occurring at different rates in different individuals, with variability about an average for the achievement of each skill or competence.

Development of Basic Aptitudes during Preschool Years

Early childhood, which we consider to occur between the ages of two and six, is typically a period of rapid physical, cognitive, and emotional growth. For example, during this time, children usually acquire the ability to feed and toilet themselves, ride tricycles, draw pictures, speak in complete sentences, and play "appropriately" with other children. The abilities or skills underlying such tasks are the result of a complex interaction of a child's inherited and acquired characteristics with the environment.

Areas of Development

1. Motor skills development

Babies do not have to be taught the basic motor skills; they just need freedom from interference. As soon as their nervous systems, muscles, and bones are mature enough, and if they have enough room and freedom to move, they keep surprising the adults around them with their new abilities. As soon as they learn one new skill, they keep practising it and getting better at it. Each newly mastered ability prepares the child to tackle the next one in the preordained sequence of motor skills.

Two of the most distinctively human motor capacities are the ability to walk on two legs and the precision grip, in which the thumb and index finger meet at their tips to form a circle.

Early childhood is a time of great leaps of motor development.

a./ Gross motor skills development

The years from two to six are considered the "golden years" for motor development (J.C. Witt et al., 1994). During this period, most children acquire a basic repertoire of manipulative and locomotor skills, develop goal-directed motor behaviours, and learn to connect two or three movements in sequences. The major gross motor skills to be developed during these years are:

– body projection (Typical body projection skills include running, jumping, hopping, skipping, and sliding. All require coordination among large muscle masses to move one's total body.),

– body manipulation (Body manipulation skills involve moving one's body or body parts in a well-defined but small area. Typical body manipulation skills include stretching, curling, rolling, bending, and balancing),
– object manipulation. (Object manipulation universally observed in young children includes throwing, catching, striking, kicking, and ball bouncing).

It is not uncommon for this array of gross motor skills to be developed in preschoolers at a different rate.

b./ Fine motor skills development

One of the most important aspects of fine motor coordination that develops during infancy is visually guided reaching. It develops around 4 months of age and allows infants to explore their world much more effectively. A primitive neonatal form (visually initiated reaching) is largely governed by biological factors and is relatively impervious to environmental deprivation. The 4-month form requires that infants experience visual feedback from their reaching movements. Later in the first year reaching again changes and in a more practiced form demands less visual attention.

Fine motor skills involve control over fine muscles. In regards to school functioning, these skills primarily involve eye-hand coordination. Three-year-olds will have made big gains in eye-hand and small-muscle coordination. This is clearly obvious in tasks such as drawing, colouring, cutting, and manipulating small objects. The skills required to accomplish these tasks successfully range from fundamental to more complex visual-spatial or perceptual-motor abilities, which in turn are important indicators of readiness for reading and writing.

I have provided a table to illustrate a typical pattern of perceptual-fine motor skill development during the period from two to seven years.

Table 2. *Typical Perceptual-Fine Motor Development in Children from Two to Seven Years Old*

2 years	**2 J**
Rotates forearms, turns knobs	Grasps too strongly with overextension
Turns pages one by one	Places blocks in form-board with no
Strings several beads	demonstration
Unwraps piece of candy	May imitate H in drawing
Imitates vertical strokes	Imitates horizontal line
Crudely imitates circular strokes	Holds crayon with fingers
Imitates V strokes	Builds 8-block tower
Aligns 2 or more blocks for a train	Adds 1-block chimney to block train

Makes 6-7 block tower
Can mach 2 or more simple shapes
Places blocks on form-board separately with demonstration

3 years

Good rotation of wrist
Builds 9-10 block tower
Imitates cross
Copies circle from a model
Cuts with scissors
Matches 3 color forms
Puts on socks and shoes
Undoes medium shirt buttons
Places 10 pellets in bottle in 30 sec (1 at a time)

4 years

Throws overhead
Cuts with scissors
Copies cross from a model
Draws crude pictures of familiar things
Builds with large blocks
Copies a diagonal line
Buttons up large size buttons
Knows front from back on clothes
Brushes teeth
Places 10 pellets into bottle in 25 sec
Performs serial opposition of thumb to fingers

5 years

Holds objects precisely and releases well
Tries to color within lines
May copy an X
May copy a triangle
Enjoys coloring, cutting, and pasting
Puts on and takes off shoes without tying
Can dress and undress alone except for small buttons and bows
Draws a house with windows and doors
Draws a person with arms, legs, feet, and facial features

Matches 1 colour form
Dries own hands

3 J

Traces a diamond
Builds 3-block bridge from a model
Washes and dries hand and face
Can eat alone properly
Matches simple colours

4 J

Copies a square
Draws a person with several body parts
Draws pictures of familiar objects
Identifies simple objects by feel-and-touch, such as ball, block, or crayon
Catches a bounced ball
May name several colours

6 years
Ties shoelaces loosely in a bow
Throws and passes a ball
Can print some letters and numbers (may be reverse)
Draws person with deteailed body parts and some clothing
Imitates inverted triangle
May imitate horizontal diamond
Bottons up small buttons on a shirt or a blouse
May know right and left on shelf
May have a stable hand preference

7 years
Copies a Maltese cross
Cuts with knife
No longer has letters b and d confusion
Draws human figure with clearly represented clothing

J = means the skill/behaviour is *just* beginning to appear.
On the basis of Bruce A. Bracken (1991).

1. Perceptual Processing

Perception and action complement each other. No action could exist without perception and perception relies ultimately on action. Together they form functional systems around which adaptive behavior develops. Perception and action are mutually dependent.

Perception is the meaning or interpretation of information received through our senses. The way we perceive something depends primarily on two things:

– The physical features of a stimulus and
– The way we organize information.

Because there are five senses, there are theoretically five types of perception. In school settings and in perceptual-motor testing, two types of perception are emphasized: visual perception and auditory perception.

Physical features of visual stimuli can vary in the dimensions of size, shape, colour, clarity, and complexity. Physical features of auditory stimuli can vary along dimensions of pitch, loudness, complexity, and similarity/dissimilarity of sounds. Organization of sensory information

depends on quantity and quality of stored information and concepts as well as an individual's level of cognitive development.

A normal child develops the ability to perceive and act upon increasingly complex perceptual stimuli over several years. Visual and auditory information from the environment is received by the child's sensory system and must be neurologically transmitted and interpreted. Such processing of information requires a well-coordinated, intact neurological system. The typical preschool child will not have fully developed information-processing capacities and thus may have difficulty copying with simple shapes (e.g. triangles, squares, diamonds), distinguishing left and right consistently, discriminating between letter symbols, or blending sounds together to form words.

Perceptual-processing difficulties are not easily distinguished from other developmental areas because the perception process is prerequisite to the functioning of virtually all behaviour. Auditory perceptual processes are central to receptive language, and visual-motor processes are essential to fine motor and gross motor functioning.

In most cases, poor perceptual processing results from developmental immaturity and limited stimulation. (A very small percentage of preschoolers have some fundamental dysfunction in their neurological system and do not benefit from increased stimulation experiences.)

2–3. Attention span

A critical aspect of perception is selective attention. Selective attention refers to the ability to select from an array of competing stimuli those stimuli that are relevant to the task at hand.

Attention is a complex concept and teachers frequently refer to it during instructions. The ability to apply persistent concentration over a period of time depends upon intact cortical and subcortical brain function.

Attention is multimodal. It can move within a modality, such as from one visual stimulus to another, or between modalities.

It is all very well to talk about attention deficit but what constitutes a deficit, a deviation from the norm that is disabling? Many factors will affect how well a child attends: the type of activity, what has preceded the activity throughout the child's day, and the child's level of interest in the task.

Call (1985) estimates that a developmentally appropriate length of attention for a sustained attention activity, such as viewing television, is as follows:

2 years old: 7 minutes
3 years old: 9 minutes
4 years old: 13 minutes

5 years old: 15 minutes
6 to 7 years old: 60 minutes

These times are presented as guidelines only; children vary greatly in their attention span. However, children with attention disorders will find it challenging to maintain attention on a structured task for lengths of time.

Cooke and Williams (1987) outlined six levels of normal development of attention control. These levels may be used to assess the child's development of attention skills.

Table 3. *Levels of Normal Development of Attention Control*

- *Level 1 (birth to 1 year).* Level 1 is characterized by extreme distractibility, in which the child's attention shifts from one object, person, or event to another. Any new event (such as someone walking by) will immediately distract the child.
- *Level 2 (1 to 2 years).* Children in level 2 can concentrate on a concrete task of their own choosing but will not tolerate any verbal or visual intervention from an adult. Their attention is single-channelled, and they must ignore all extraneous stimuli in order to concentrate upon the task at hand.
- *Level 3 (2 to 3 years).* Children's attention is still single-channelled in level 3. They cannot attend to competing auditory and visual stimuli from different sources. For example, they cannot listen to an adult's directions while playing but with the adult's help, they can shift their full attention to the speaker and then back to the game.
- *Level 4 (3 to 4 years).* The child in level 4 must still alternate full attention (visual and auditory) between the speaker and the task, but now does this spontaneously without needing an adult to focus that attention.
- *Level 5 (4 to 5 years).* By level 5, attention is two-channelled; that is, the child understands verbal instructions related to the task without interrupting the activity to look at the speaker. The child's concentration span may still be short, but group instruction is possible.
- *Level 6 (5 to 6 years).* In the final stage, auditory, visual, and manipulatory channels are fully integrated, and the child's attention is well-established and sustained.

From Martin Herbert (2003), *Typical and Atypical Development. From Conception to Adolescence*. BPS Blackwell.

Attention and perception play a crucial role in solving many cognitive tasks. Selection and control of attention are a prerequisite to succeed in those

tasks in which the essential elements must be distinguished from the inessential ones. Perception is basic for activities such as categorization, which is essential to introduce a given order in the informational diversity.

The important role of attention and perception is easily seen in activities such as reading, language comprehension, spatial orientation, and habit formation. Both processes – attention and perception – make great progress during the preschool period. Preschoolers have difficulty in voluntarily focusing their attention on specific aspects and get easily distracted when other stimuli are presented. They are slower and less precise than older children when they have to block their attention to discard non-pertinent stimuli. Also, when they look at a complex stimulus, their exploration process is neither systematic nor complete.

4. Language

Language abilities can be divided into receptive language and expressive language. Receptive language involves the ability to understand what is said and is often assessed in young children by observing motor responses such as nodding or pointing. Expressive language requires speaking and involves knowledge of syntax and grammar. It is assessed by analyzing language samples on dimensions of sentence length and complexity, word use, and grammatical features. In general, oral expressive language abilities develop later than receptive language; children thus often understand the meaning of a word long before they say that word.

Speech/Articulation

Although speech and language are highly related, they are distinct aspects of verbal communication. Speech involves the generation of sound in a coherent pattern. It is the process of using language. Important components of speech are articulation (formation of sounds), voice (pitch and intensity of vocal production), and rhythm (integration of sounds in a comprehensible manner).

In the preschool years, the assessment of speech is at a basic level. Minor articulation errors are common. The most active period of speech-sound development is from 18 months to four years, by which time all the vowel sounds and many consonant sounds are mastered by normal children. Acquisition of vowel sounds is normally completed by age three, whereas all consonant sounds often are not accomplished until age eight.

5. Cognitive skills

In general, cognition encompasses a wide range of mental abilities. In practice, subsets of cognitive abilities, namely attention, memory, comprehension, and reasoning, are of primary concern to educators and psychologists. Activities such as classifying objects according to colour, shape, or size; identifying similarities and differences; repeating phases or sets of numbers; and naming letters and numbers are examples of tasks requiring basic cognitive skills.

During their first year of age, babies do not seem to be interested in images at all. The same applies to other symbols displayed in different formats. They treat them like any other object, more or less interested depending on their intrinsic properties. It is not until the second half of the second year that symbols are seen differently because they become representative objects. At the end of infancy, at around 18 months, there is a qualitative change in children's cognition.

One of the most important milestones in preschool development is the possibility to understand and use symbols. As Vygotsky said "Symbols expand the realm of thinking by enabling children to represent, draw inferences from, and make predictions about objects and events they have never directly experienced".

Children's interest increases as they begin to interpret simple graphic images. They become aware that symbols have a meaning that goes beyond their physical properties. Symbols represent something that is absent. The comprehension and use of symbols progress spectacularly during the preschool period, setting up an essential basis for most school learning and facilitating children's adaptation to the cultural context. The symbolic relationship is never totally transparent. Its interpretation requires a long elaboration that involves other people capable of making that interpretation. In spite of the fact that the first intuition that something stands for something else may be an early acquisition, younger preschoolers may demonstrate symbol-referent confusion. This confusion is present in both the iconic and the arbitrary symbols (writing or numerical notations).

One of the main characteristics of the human mind is its limited capacity to choose and select information. Preschool children's cognitive skills are claimed to depend on many factors and cannot be considered homogenous. The cognitive differences between a 4- and an 8-year-old child would depend on how the processing limitations were overcome. This should depend on factors related to the task and previous experience.

In contrast to infants, preschool aged children's cognition is much more comprehensive. The preschooler's method of reasoning is not always logical,

their explanations are often subjective and there is a lack of stability in their knowledge.

Memory

In the most general sense, memory is the ability of living organisms to store and use past experience. Thus all learning implies memory. Regardless of how broadly one defines memory, it can be described as involving three processes:

- Encoding, or acquiring and organizing elements of experience through perceptual and cognitive processes.
- Retention, or storage of the acquired elements.
- Retrieval, or location and extraction of retained elements.

Retrieval is usually achieved by way of cues, which are stimuli that initiate and guide the search for stored elements. The most basic form of retrieval is recognition, in which the cue is a reoccurrence of the stored item.

Newborns and even foetuses have limited memory, and capacity for memory develops rapidly over the first year. What is remembered and for how long changes rapidly over the first year. Cuing is important for retrieval. Both encoding and retrieval become more advanced in the period from 8 to 18 months, but become abstract only at the latter time. A transition to still more advanced processes (meta-memory and mnemonic devices) takes place around 2 years.

Language organizes events. Tessler and Nelson examined 4-year-old children's memories of a visit to a museum as a function of what the mother and child talked about as they toured the exhibits. Children did not recall anything about objects or activities that were only mentioned by the mother or the child. But objects, activities or any information jointly discussed were recalled only.

Age differences in the capacity of short-term store were typically found in developmental studies that used memory span tasks. (Such tasks require that participants must repeat, in exact order, a series of rapidly presented items such as digits or words.) Age differences in memory span are very stable. Dempster (1981) reported that the memory span of 2-year-olds is about two items; of 5-year-olds about four items; of 7-year-olds about five items, and 9-year-olds about six items. The average memory span of adults is about seven items.

Educational readiness

School readiness subsumes a wide range of skills and behaviour related to success in school. School readiness primarily cuts across areas of cognitive,

language, and fine motor development. Skills or behaviours typically considered important to school readiness include copying shapes and figures, identifying numbers and letters, knowing left and right orientation, and understanding basic concepts such as same-different, top-bottom, first-last, and before-after. Most educators believe attentional abilities and interpersonal characteristics such as working and playing cooperatively and following teachers' directions are also important prerequisites for success in school.

As for cognitive – intellectual – readiness, educational psychologists are concerned not only with the problems of "what" and "how" to teach but also the problem of "when" to teach this or that. School readiness is an essential question for educational psychologists, teachers, parents and children. In Hungary for children who are tested for school readiness before entering the first grade, psychologists have to differentiate between "general developmental readiness" and "subject-matter readiness". *General developmental readiness* in the developmental sense of the term "readiness" describes general cognitive maturity which mostly depends on changes in intellectual functioning related to age-level. Age level related changes in intellectual functioning influence learning, retention and thinking processes have been identified in some areas of cognitive functioning, for example: perception, subjectivity-objectivity, structure of knowledge and problem solving. *Subject matter readiness* depends mostly on previous learning and experience. Social factors, such as home environment, SES (social economic status) and attentive parents are the most important factors of subject-matter readiness. The effects of nurseries can compensate to a certain degree for a disadvantageous early environment. In Hungary most children go to nursery-school at least one year prior to entering the first grade. Most of them spend 3 or 4 years before starting school-learning.

School readiness means much more than cognitive readiness. Personality factors, e.g. the development of dependency, anxiety or insecurity and aggression are also important.

Before children can learn to write they must develop certain skills: e.g. eye-hand coordination, sequencing abilities, memory. To learn to read, children need visual and auditory discrimination ability and memory, the ability to see relationships and to learn from repetition and ability to concentrate.

How do writing skills develop?

Children's writing emerges out of their early scribbles, which appear at around two to three years of age. In early childhood children's motor skills usually become well enough developed for them to begin printing letters and

their name. As they develop their printing skills, they gradually learn to distinguish between the distinctive characteristics of letters, such as whether the lines are curved or straight, open or closed, and so on. Through the early elementary grades, many children still continue to reverse letters such as b and d and p and q (in Hungarian letter g). At this point in development, providing other aspects of the child's development are normal, these letter reversals do not predict literacy problems.

Like becoming a good reader, becoming a good writer takes many years and lots of practice.

What are some developmental changes in the way children think about mathematics and their math abilities at different ages?

Children already have a substantial understanding of numbers before they enter first grade. Most kindergartners can accurately count the number of objects in a set, can add and subtract single digits, and know the relative magnitudes of single-digit numbers (e.g. that 8 is greater than 6). Understanding basic aspects of number is critical in kindergarten through the second grade (e.g. at these grade levels, children need to learn the base-ten numeration system; they must recognize that the word *ten* may represent a single entity or ten separate units and that these representations can be interchanged). Children enter the elementary school with different levels of mathematical understanding.

Learning Disabilities

H. Werner and A. Strauss worked with mentally retarded, autistic, and brain-injured children in the 1940s. Central of Werner's and Strauss's assumptions regarding learning problems were *perceptual disorders*, particularly *figure-ground disturbances*. The figure-ground disturbance refers to the tendency to confuse an object with its background. Normally, when we perceive a stimulus (e.g. a painting), we tend to focus on the main object and its details and tend to ignore much of the background. In a figure-ground disturbance, some individuals will focus on or be distracted by details of the background and ignore the figure. In other words, a figure-ground disturbance is "not being able to see the tree for the forest." This relates back to the idea of selective attention discussed earlier. That is, persons with a figure-ground disturbance tend to focus on irrelevant aspects of a stimulus (background) and not upon relevant aspects of that stimulus (the figure).

In the 1960s a new term was introduced to describe children who had no demonstrable sensory impairments and were not mentally disabled but still had difficulty learning. Kirk labelled these children *learning disabled*, and

many of their characteristics were similar to those first described in the 1940s by Werner and Strauss in discussing brain-injured children.

The term "learning disability" is commonly used to describe any learning disorder that is not the result of organic defect, low intelligence, emotional disturbance, or environmental deprivation.

A key component in identifying a learning disability in such cases is the discrepancy between a child's ability and his achievement (Nabuzoka, 2004).

It is generally recognised that the social context plays a significant role in defining developmental problems.

The child with an attention disorder is responding to too many stimuli. This child is always on the move, is distractible, cannot sustain attention long enough to learn, and cannot direct attention purposefully.

Children with learning disabilities in visual perception may not understand written words, or other visual symbols. Children with auditory perception difficulties may not be able to understand or interpret spoken language. There are many factors in the environment with which perceptually disordered children cannot cope. These include, not only elements that signify deeper meaning, but awareness of objects and their relationships to them. The disability can affect left-right orientation, body image, spatial orientation, motor learning, and visual closure (seeing the whole from presentation of a part) (Kirk & Gallagher, 1989).

The identification of learning disabilities in preschool children is directly related to behaviour on age-appropriate tasks. These tasks often involve pre-academic readiness skills (e.g. holding a crayon, cutting with scissors). Some children have trouble with gross and fine motor development. Others are slow to develop oral language and reasoning abilities. The most common disorders among preschoolers are delayed language development, poor perceptual-motor skills, and lack of attention.

According to surveys, between 5% and 15% of school-age children have learning disabilities (Taylor, 1989).

Learning Disabilities Prevention – the Characteristics of Kindergarten Educational Program for Learning Disabilities Prevention

What should we take into account in the case of kindergarten-age children?

Children change rapidly during these years. For *three-year-olds*, learning should emphasize language, activity, and movement, with major emphasis on large muscle activities. *Four-year-olds* need more variety in their activities and can begin to enjoy small motor activities (e.g. manipulating scissors). In teaching language to children, particularly *five-year-olds*, you should offer practice in a meaningful context rather than focus on isolated skills. For *six-, seven-year-olds,* cognitive growth can be fostered through hands-on activity and experimentation. Children at this age are mainly interested in games with sets of rules and can learn much by taking part in them.

P. Balogh's experiments in the last 20 years in Hungary:

1. An attempt at the prevention of learning disorders in children of kindergarten age

The experimental training program commenced at the end of '80s in the "little group" (three-year-olds) from a kindergarten in an area of block of flats in Budapest. (One "little group" from another kindergarten in the same area served as a control group. No training program was applied to the latter group, only the traditional curriculum).

In the experimental group the annual curricula of physical education and general knowledge classes were elaborated by the kindergarten teachers by taking into account those points of the training program which can be developed as a matter of course during the processing of the topics of the curriculum. The training methods were playful, relied on intrinsic motivation and, as far as possible, adjusted to the age characteristics of the children.

The training program was continuously improved during the three-year period of kindergarten education.

In the "little group" (3-year-olds) the goals of development dealt with movement and body scheme while in the "middle group" (4-year-olds) and "big-group" (5-year-olds) the goals of the program included the retention of the achievements of the previous year and the more direct development of perception, with particular emphasis on the development of space perception.

[*The experimental methods were:* procedures employed by kindergarten teachers; psycho diagnostic tests; video-recordings of the classes; repeated assessment of performance on tests a year latter in the "middle group", and two years later in the "big group"; the analysis of academic achievement at the end of the first semester, and at the end of the second semester of the first grade.]

The efficiency of the three-year training program was evaluated from two aspects:

- By the comparative analysis of the achievements on tests applied to the experimental group and the control group.
  - at the initial stage
  - half-way through the training program
  - at the end of the training program

Before the start of the training program it was expected that there would be positive and intensive changes as a result of the training.

- By the microanalysis of the experimental group's results it was possible to answer the following questions:
  - In which areas is the training program primarily efficient in developing and what length of time is needed for effective development?
  - How does the developmental effect assert itself in the case of different SES (socio economic status) levels?
  - Can we expect a significant positive change as a result of the training program in the case of children with MCD (minimal cerebral dysfunction)?

Apart from the age homogeneity of the experimental and the control group, both groups were heterogeneous, so when the effectiveness was evaluated, it was not the numerical result that served as their guideline, but rather the quality and the intensity of change as compared to the initial level of each group.

Numerical data of the evaluation research proved that as compared to the control group a more intensive positive development emerged in all areas in the experimental group which had been taking part in the training program over a period of three years.

The results of the repeated assessments pointed to very significant positive changes as compared to the initial level but this required a 3-year training period. The tendency of group performance toward homogeneousness was obvious and homogeneity of achievement approaches the maximum in the case of the body scheme, movement and organisation of visual-motor structure.

All test results of the third assessment of the experimental group surpassed the average standard level for the age group, while at the initial level there was extreme underachievement in most tests.

It had become a proven fact that the advantage in SES level made it felt in the development of perceptual functions. In this area it was the disadvantage by the low SES which was the most difficult to overcome.

It is noteworthy that as a result of the 3-year developmental training program the low SES group was capable of making up for its significant lag in the level of performance as compared to the high SES sample.

The disadvantage caused by MCD can be decreased by consciously-focused development. It continued to exist in the control group where only general development of the cognitive structures took place (P. Balogh, 1989).

2. Early screening and correction of learning disturbances

Due to the implementation of the Flexible School Entrance Age Law and emphasizing the fact that teaching reading in schools is not effective enough, it has become urgent to explore and clarify the present conditions and the situation in the field of school readiness and successful performance. It was especially important to clarify the extent to which reading disabilities are due to the psychic readiness of the child when entering school or the methods used in teaching reading are the most decisive factor.

Besides measuring school readiness, P. Balogh's goal was to adapt those psycho-diagnostic procedures to group situations which earlier had proven reliable in measuring psychic functions which determine learning ability and which had had a good prognostic value in the face of school successful performance when administered to an individual, one-to-one situation. Her reasons for trying to adapt the psychological screening procedures for use in group situations are two-fold:

– Since prevention is a central aspect of the work of school psychologists, diagnostic methods used by them are primarily targeting groups, i.e. they mainly use group screening procedures.
– Many experiments have verified the finding that results gained from tests administered in a group situation significantly differ from those gained from tests administered on a one-to-one basis in the case of same-age students. At the same time, a group situation is analogous to a pedagogical situation. Results gained from group procedures correspond more closely to what teachers experience with children; therefore school psychologists can give more realistic information and more effective help to teachers.

The school psychologists screened a nationwide representative sample of 1350 children in 56 different first grade classes of elementary schools.

The theoretical basis of the development programs and their contents (indirect methods, complexity) were the same. Altogether 60 children took part in the group developmental program.

[Pedagogical procedures and psychological testing were used in the screening of the 56 first grade classes: procedures used by teachers:

classroom observation, analysis of achievement; group screening by psychological tests: to measure attention, perception of abstract gestalts, the differentiation and recognition of letters and the copying of geometric shapes; the individual and differentiated testing of children who exhibit severe dysfunctions during the screening procedure.]

On the basis of the development of specific functions as measured by psychological methods, it could be stated that the school readiness of the 1350 first-grade children in the study was on a relatively low level; their results were dispersed on a wide range with the distribution maximum tending to be nearer to the minimum pole.

16.5 % of children entering school produced an achievement level characteristic of 4-5-year-olds in the test measuring the development of space-perception. For example, these children identified only one or none of the five abstract drawings as being identical in the Edtfeldt test which requires the judgement of form-size-whole-part and space orientation for success. This problem alone is enough for these children not to be successfully taught the precise identification of spatial-orientation, which could be taught at a kindergarten age in the most natural way, i.e. through games requiring movement. It was quite clear that these children lack the psychic readiness indispensable for school readiness.

- The average level of achievements in group-administered test situations was the same as when testing 5-6-year-olds in individual situations, but in the case of the Edtfeldt test this is equal to the performance of 4-5-year-olds. The main problem lies in space-orientation.
- Results according to residential area:
  - The average score of children residing in Budapest was better in all tests with the exception of the attention task (achievement in percentage).
  - Children attending schools in high-rise housing estates performed on a higher level of achievement on all tests with the exception of the attention task. The achievement percentage of children attending traditional schools compared to non-traditional ones is better on the tasks dealing with letters.
  - There was no decisive clear-cut positive change in performance according to age-range. Highest achievements could be found in the second range (6 years 5 months – 7 years), while 7-7-and-a-half-year-olds tend to be the most successful in copying geometric forms.

The psychic development and school readiness of children entering first grade in the elementary school were on a low level. In order to avoid this, a set of tests were used to measure school-readiness and whether it should be supplemented with tests measuring the development of visual-motor functions which provide a more reliable prognosis.

On the basis of results regarding different age-ranges, it was questionable whether it was adequate to start schooling for children who have just turned six. These children's performance was the poorest in all functions measured. The alternative of flexible school entrance was exercised mainly by parents who are white-collar workers, while children with a low socio-economic status or who were explicitly disadvantaged tend to start school on the basis of their chronological age. Homogeneity according to age could not be accomplished within a first grade class as children who had just turned six attend the same class as 7-and-a-half-year-olds or even 8-year-olds. The psychic and somatic developmental level of these children varies to a great extent; this is a difficult problem to solve for teachers who work with first grade pupils. Until the use of this set of tests becomes general practice, this problem could be solved by placing children on the same level of psychic development into one class and t he need to differentiate within this would affect fewer children.

Is it possible to delineate an optimum age-range from the viewpoint of learning abilities?

On the basis of results from all tests administered, children in the 6.5-year-old age-range and in the 7-year-old age range performed on the maximum achievement level so it can be concluded that the optimum age to start schooling is 7 years of age.

We gained useful information regarding the screening procedures, as well.

Tests chosen to be a part of the screening procedure are adequate for administering in group-situation only. This results in a lower level of performance in the case of testing same-age children in a one-to-one situation. In our view, this can be the result of social immaturity, in which case instructions given to children as a group are not as motivating as in the more personal, one-to-one situation. The lower performance level can be due to the fact that there are more distracting stimuli and disrupting moments in a group situation and concentration span is lower. In spite of this, or perhaps because of this similarity to class-teaching situations, there was a great convergence in the results of pedagogical and psychological assessments. The applied procedures proved to be reliable in the screening of children with learning disabilities.

On the basis of our findings there is no overlap between the three screening procedures, i.e. they give information regarding different areas, and therefore we feel none of them can be omitted. The tests supplement each other and they can be used for the purpose of screening a larger population.

We can recommend their unaltered use to school psychologists with the restriction that, in the case of underachievement, further and more differentiated testing is needed. The most adequate form of this is an individual, one-to-one diagnostic screening with more precise data concerning early development and family life, which makes the assessment of developmental differences possible (P. Balogh, 1990).

The Characteristics of the Kindergarten Educational Program

In establishing the concept of the educational program, the following theoretical and empirical findings were considered:

1. Current views in developmental psychology, and empirical data on the formation and ontogeny of cognitive structure.
2. The characteristics of the phases of the development of the perceptual and perceptuo-motor functions.
3. The age specific features of the cognitive development of 3 to 6-year-old children.
4. Piaget's psychology of operations; Bruner's views on the development of the levels of representation; Flavell's theory on the heterogeneous development of cognitive structure; and the developmental research pointing out the existence of sensitive periods and dominant ability structures.

The enrichment and development of a given scheme-system at an iconic representational level can be achieved most efficiently if the training tasks allow the simultaneous emergence and application of the enactive and symbolic (linguistic) levels of representation. While the enactive level guarantees the content validity of the schemes, the accompanying verbalization brings them closer to the level of symbolic representation.

The training program for the development of perceptual and perceptual-motor functions has been worked out by taking the above relationships into account; while at the same time guaranteeing the simultaneous promotion of movement, body scheme and verbal skills, as well.

The Complex Educational Programme for Learning Disabilities Prevention was worked out in the 90's considering findings in developmental psychology and P. Balogh's previous research data.

Areas of development targeted for assessment are (by P. Balogh):

- Motor (gross, fine) skills
- Body scheme
- Spatial orientation
- Cognitive skills
- Eye-hand coordination
- Language, speech/articulation
- Social skills

Motor development

Kindergarten: Name: Date of birth:	Entering	Little-group	Middle-group	Big-group
"Pumping"				
"Stretching fingers in a fan"				
Stringing beads				
Hopping (on two and one leg)				
Catching (a ball)				
Balancing on one foot (15 min)				
Touching each finger to the thumb				
Sensing fingers with eyes closed				
Forming a fist by curling fingers				
Right or left handed				

Body scheme development

Kindergarten: Name: Date of birth:	Entering	Little-group	Middle-group	Big-group
Head, body (trunk), back, tummy				
Eye, eyelid				
Nose, nose's wing				
Mouth, tongue				
Ear, neck, back of the earlobe				
Hand, back of the hand, palm				
Fingers, finger tips,				

knuckle
Leg
Brest, chest
Face
Arm
Thigh
Knee, knee-joint
Forehead, eyebrow
Chin
Elbow
Joint
Ankle
Foot, sole
Toe, heel
Shoulder
Waist
Hip

Spatial orientation development

Kindergarten: Name: Date of birth:	Entering	Little-group	Middle-group	Big-group
Up				
Down				
Below				
Above				
Over				
Right, left				
Ahead				
Back				
Beside				
Between				
Under				
Can change direction				
Behind				
Before				
On the right side				
On the left side				
Beyond				
Among				

Cognitive development

Kindergarten: Name: Date of birth:		Entering	Little-group	Middle-group	Big-group
Classifying objects according to	colour shape size similarities-differences				
Recognizing events related to time	iconic symbolic causality				
Features of attention span	can concentrate pay attention for a short period pay attention only during playing easily distracted scattered, inattentive others				
Performing motor tasks verbally	perfect, exact essential elements unable to talk				

Fine motor (eye-hand coordination) development

↓

on the basis of Goodenough's "draw-a-man" test

Language development

Kindergarten: Name: Date of birth:		Entering	Little-group	Middle-group	Big-group
Vocabulary	rich average poor				
Occurrence of abstract expressions	often sometimes never				

	speech defects
	(what kind?)
	fluent
Speech rhythm	halting
	quick
	slow
	in sequence
Description of a picture	identifies a
	simple action
	realises
	relations
	correct
	salient
Text reproduction	features
	incomplete
	unable to
	reproduce

Social development

Kindergarten: Name: Date of birth:		Entering	Little-group	Middle-group	Big-group
Contact with adults (rapport)	initiate				
	accept				
	withdraw				
	refuse				
Contact peers	initiate				
	accept				
	withdraw				
	refuse				
Acting	looking around				
	acting alone				
	streaming				
	getting connected				
	with the others				
	complying				
	cooperating				
	initiating				
	leading				
Perceiving the task	reacting				
	accepting				
	performing				
	can’t make sense				
	perceives but does				

	not perform
	perceives in parts
	perceives under directions
	perceives alone
	absorbed and persistent
	confused
	even-tempered (balanced)
Emotional aspects	nervous
	aggressive
	moody
	withdrawn (uncommunicative)

Subject matter readiness

Kindergarten: Name: Date of birth:		Entering	Little-group	Middle-group	Big-group
	performs without help				
Independence	sometimes with help				
	only with help				
	well motivated				
Coping with a task	unmotivated				
	absorbed				
	doesn't absorb				
	persistent				
	non-persistent				
	fast, dynamic				
	average				
	dawdling, hesitant				
Speed of working	shifting attention easily				
	shifting attention not easily				

When frustrated	tolerant gives up hot-tempered aggressive regressive

From Katalin P. Balogh et al. (1997, 2004): Komplex prevenciós óvodai program. Kudarc nélkül az iskolában. Trefort Kiadó, Budapest.

For ***school-based observation*** Katalin P. Balogh provides observational questions/criteria for the teacher to follow:

I. Typical behaviour

1. Moves consistently (fidgets).
2. Touches something consistently.
3. Cannot hear when called (or pretends).
4. Startles when called.
5. Moody with outbursts.
6. Changes (or discontinues) activity with difficulty.
7. Moves very slowly and/or hesitantly.
8. Very shy, fractious.
9. Others:

II. Behaviour during school-activity

1. Does not pay attention, as if he is not being there.
2. Easily distracted.
3. Does not follow teacher's instructions.
4. Does not begin to work, it seems as if he is not understanding the task.
5. Remains silent (as if confused) when being asked.
6. Does not work neatly but provides convulsive writing and drawing when presented with pictures and written text; crumples the paper.
7. Is not able to wait or is delayed.

*The **main points of the educational programme*** are as follows:

To ensure complex manifold effect the emphases are put on:

- the development of the motor skills (gross, fine),
- the development of the various perceptual (visual, auditive, tactile and kinaesthetic) channels,

- body scheme, development of the perception of three-dimensional space by developing laterality,
- verbal development.

Indirect approach, the use of playful methods – in accordance with the children's development stage.

Main areas of the educational programme

Development of motor skills:

- gross motor (e.g. walking, running, jumping, sliding, crawling, climbing in different kinds of rhythm)
- balancing (e.g. standing on toes, heel, one foot; walking, crawling on a narrow surfaces; body roll; rollers; bicycle, skates)
- eye-hand coordination (e.g. throwing a bean-bag at a different size of cycle from different range; throwing a hoop in different directions; bowling; ball-games)
- eye-foot coordination (e.g. skipping-rope; hopscotch; drawing with foot different kind of shapes on the floor, sand, etc.)
- fine motor (e.g. forming play-dough; building blocks; folding paper, puzzles; cutting; paper-and-pencil exercises: drawing, painting, colouring)

Development of body-scheme:

- recognizing the parts of the body (e.g. exercises with mirror – recognizing external features; touching and identifying the parts of the body with eyes opened and closed; focusing attention on definite parts of the body in different postures)
- laterality (e.g. motor exercises with left and right hand, foot; recognizing front and back parts of the body; teaching vertical zone of the body; exercises with compared postures: stand/climb/sit/kneel/lie in front of, behind, beside, between or under something.)
- concept of the body (knowledge of the function of the body and its parts) (e.g. motor exercises with parts of the body: head, trunk, arms, fingers, feet, toes; identifying the parts of the body and their functions; recognizing the parts of the body according to their function; recognizing the parts of the body on a picture)

Development of perception:

- visual (e.g. controlling of the eye-movement; visual fixation; visual gestalt – parts and whole: what's absent, finding the hidden figure; recognizing chronological order according to pictures; continuation of visual rhythm; recognizing visual position; development of visual memory)
- gestalt and shape constancy (e.g. forming different shape, size with movement; recognizing different objects, shapes, sizes in the environment; organizing visual patterns in relation to shapes, sizes, colours; setting different shapes in order)
- tactile (e.g. rounding, rolling, flatting play-dough, clay; forming different shapes, sizes; changing different forms, sizes; recognising small objects by touching)
- kinaesthetic (e.g. moving certain movement with hand, foot – with eyes opened and closed; drawing a shape on one's back – recognizing and removing it)
- space perception (e.g. recognizing the basic directions with parts of the body, with objects; teaching the expressions of relative position)
- auditive (e.g. listening to different sounds of the human, nature; clapping, tapping rhythm; collecting words with certain vowel)
- intermodal channels: visual – tactile (e.g. where are the recognized by touching objects in the visual field); visual – auditive (e.g. show the object, animal you have heard in the picture); visual – kinaesthetic (e.g. recognizing movements in the visual field); auditive – tactile (e.g. describing objects by touching)

Development of verbal skills: naming objects in the house, kindergarten, close environment:

- clothes
- parts of the body
- actions
- relative positions: directions, locations, space of time
- classification: basic shapes, basic colours, sizes, similarities – dissimilarities, opposites.

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