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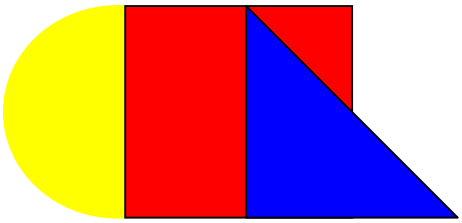
NLD primary materials

Basic theory, approach and hands-on strategies



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Child Neuropsychology Foundation

Objective

- The NLD interventions are dedicated to children who have a special auditory-verbal sensitivity.
- Living in an overwhelming visual world is difficult. Many school books that contain crowded pictures, projects need to be filled with figures, assignments have to be made by searching for the answer on the visual-spatial internet, arithmetic no longer contains only numbers and technical calculations and instructions are given visually, directly referring to its implementation.
- It’s a heavy task to stay calm.

Learning how to learn

It seems as if it is an unspoken rule that all the information channels have to be opened at once. Many children find it common to listen, to see and to act simultaneous. They listen to other children, look at the pictures on the school board and do their assignment in their exercise books.

Children with NLD cannot listen and see and act at once - this is their problem. But a problem exists only when there is no knowledge about it, if there is ignorance about it, or if there is a defense of doing something about it.

A too one-sided information processing

NLD arises when the development of a specific learning preference of auditory-verbal information processing is too one-sided and isn’t accompanied with a similar level of visual-constructive information processing.
When there is too great a difference between the level of auditory-verbal and visual constructive information processing, consequences will follow.

Consequences

The main consequence is ignoring tactile-visual information. Children with NLD ‘’forget’’ sensory and visual exploration because they get their information through asking, hearing and telling a lot of stories.

But the teacher doesn’t verbalize everything. After a short instruction, they refer to - the school board, the pictures or the figures in - the exercise book.
Then the teacher says, ‘’get started with your assignment’’. The child with NLD is still trying to understand the short instruction, not knowing what to look at, or where to start. The other children are still busy and can handle the combination of auditory-verbal and visual information. They are used to it. The child with NLD will often ask again what to do and the teacher usually answers that it was just told. The child thinks that he or she is stupid and the teacher thinks that the child is dull.

Different learning style

All of this refers to the different learning style that children with NLD have. When they hear instructions for the first time, they are only preparing themselves to listen. When they hear the instructions the second time, they listen. When they look at a picture for the first time, they look at a detailed piece. When they look for a second time they see another part of it and when they look for the third time they see something else and so on. There is no visual overview at once. Only when they use the sequence ‘’first text, picture next’’, does the picture make sense.

Listen and tell, verbalize

Children with NLD need to be aware of their own learning style and quit comparing themselves with others in the wrong way. Their learning style is: ‘’listen twice, look for three times, tell yourself what you are searching for, verbalize it, look another time and then get started’’. Many children can start at once, but a child with NLD wants to start to quickly and tends to forget all the steps in between.

NLD primary materials

The NLD primary materials provides:

- practical overview of the basic theory,
- method
- hands-on strategies of the essential educational materials for the intervention of children with Nonverbal Learning Disabilities (NLD).

NLD, how to deal with?

- Important question
  - Parents, teachers, resident tutors, ambulant tutors and remedial teachers
- different basic assumptions in defining what is and what is not NLD.
- In order to reach the necessary consensus, the basic principles of the theory – definition, characteristics and criteria, cause and typical development – are given to enable suitable assistance and to find an effective approach.

Neuropsychological profile the causal criterion

There must be a neuropsychological profile which consists of assets in combination with deficits. In this there must be:

1. A significant difference between the auditory-verbal memory as an asset and a deficit in the visual-constructive memory. Both memory profiles must be measured with a standardized auditory-verbal memory test, and a standardized visual-constructive memory test respectively.
2. A significant difference between the asset of the dominant hand and the deficit in the performance of the non-dominant hand in fine motor performance-tasks and in the tactile performance and memory tasks.

Subtype Learning Disability

NLD is a neuropsychological diagnosis.

subtype learning disability

great difficulty dealing with nonverbal information.

New information they see and have to act upon does not come automatically to them.

At a young age, they barely investigate their environment, don't play much and have great difficulty with visual-constructive and sensopatic material, in other words, areas where they must feel and act.

As they grow older, their visual-spatial development and sense of numbers show great differences compared to other children of their age group.

Appliction problem

Children with NLD can remember information they hear perfectly everything they are being told.

However, their attention to visual information is poor.

Dealing with visual-spatial information poses great problems and requires special assistance.

The basic profile

So, NLD is about children who perform well in hearing (auditory) and speaking (verbal) and have great difficulty seeing (visual) and acting (constructive).

In order to be able to help children with NLD, special materials are required.

Based on scientific studies (Serlier-van den Bergh & Jongepier, 2005) it has been researched which materials will be needed to deal with their basic deficiencies.

Definition

NLD is a neuropsychological profile of assets, (auditory-verbal) with a significant Difference with the deficits (visual constructive).

This causes differences between good Technical reading and problems with Comprehensive arithmetic and imperfections in their social-emotional growth.

The discrepant development of the perception, the attention, and the memory is crucial. The Seriousness and degree of NLD is determined by the extent of the difference between the assets and deficits. The greater the difference between these two, the more serious becomes the NLD development - the more compensation is needed.
(Serlier-van den Bergh, A.M.H.L.)

Disharmonic functioning

When there is a great difference between assets and deficits, a profile of “highs” and ‘’lows” originates.

NLD is a combined diagnosis of (very) good auditory-verbal learning in relation to (very) poor visual spatial constructive understanding and much resistance to prompt acting and performing.

Academic profile

the academic consequence criterion

1. There must be an increasing difference in performance between the technical reading as an asset and the comprehensive arithmetic as a deficit.
2. Often there is an increasing difference between the technical reading as an asset and the comprehensive reading as a deficit.
3. There may be an increasing difference between the technical – ciphering arithmetic as an asset and the spatial comprehensive arithmetic as a deficit.
4. There may be persistent phonetic accurate spelling mistakes (writing according speech) and mistakes in applying spelling rules, due to problems of the ‘’sound-sign’’ switch.

Socioemotional profile

the behavioral consequence criterion

There is often a growing problem with bonding and adapting to novel social situations. They perform better in a one on one situation and the second time. They often think black and white, they are focused on details and miss cause and consequence. They show a cyclical alternating behavior and there is a slower social awareness except their alertness for injustice. They are longer physical and emotional dependent.

Screening and detecting children with NLD.

- To verify whether the academic and/or social-emotional growth is a consequence of NLD and whether a neuropsychological examination for children is necessary, the Non-verbal Learning Disability scales were developed (Serlier-van den Bergh 2006). These NLD-scales are now available.

NLD scales

- The NLD-scales consist of two questionnaires: the pre-school NLD scale and the NLD scale.
- The pre-school NLD scale is a questionnaire consisting of 40 questions and is intended to determine the early characteristics of NLD at the age of 0 up to and including the age of 6.
- The Non-verbal Learning Disability scale is a questionnaire of 34 questions and is a revision of the Non-verbal Learning Disabilities scale by Rourke (1993).

The NLD scale is intended to detect NLD characteristics in children at the age of 6 through 12. With both scales, the assessors, who know the child well (parents, teachers, mentors, social workers), can determine whether the total scores of the scales fit within the NLD risk-area or not.

How often does NLD occur?

- From studies (Serlier-van den Bergh, 2000, 2002) among 3.765 children in primary and special need schools in the Netherlands, it has been determined that NLD occurs in approximately **5% of the primary school** pupils and in approximately **10% of children in special schools.** This means that in every class, potentially one child can have a non-verbal learning problem. In special school, this can expand to two per class.

Developmental stages

Right after birth they are silent, quiet and during the day, easy,

The toddler is attached and frequently asking ‘’tell more stories to me’’,

The infant wants to listen and talk, instead of cutting, pricking and pasting,

In grade 1 to much new visual information, they don’t want to take the first step in anything,

In grade 2, hand-eye coordination is slow, they miss instructions on the school board,

In grade 3, visual-constructive memory and arithmetic is panic, not getting a reward,

In grade 4, they have to apply and combine, but the gap is now too large,

In grade 5, they have to catch up a lot of arithmetic, but there is no march,

In grade 6 being aware of coming transition, not seeing their assets anymore,

Then, help the other self to arise; no complex visual-constructive information, before …

they have heard what to do next; that’s their auditory-verbal beginning …

of a new story,

so, don’t worry.

Learning preference, learning style, learning behavior

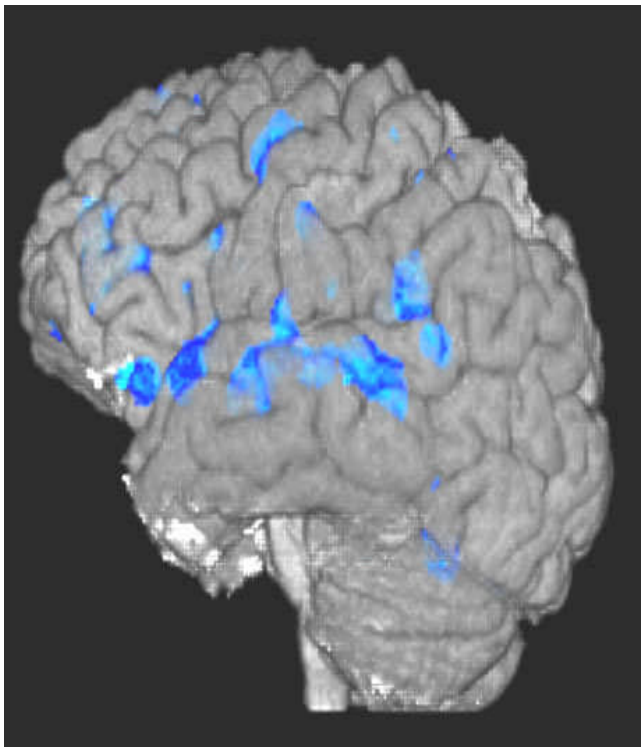
- Children with NLD have by nature a specific basic preference for learning; the preference of how they learn and how they want to absorb information.
  - Their way of learning is: hear first, then think about it, then see it, and only then, act upon it.
- The learning style refers to the way a child learns and the learning behavior is a combination of the learning preference and the acquired learning style.

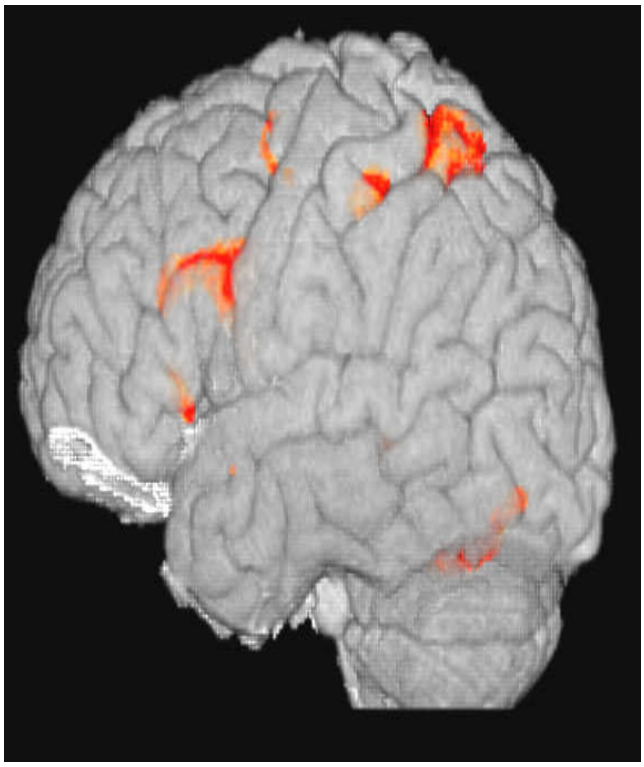
Basic approach

First text,

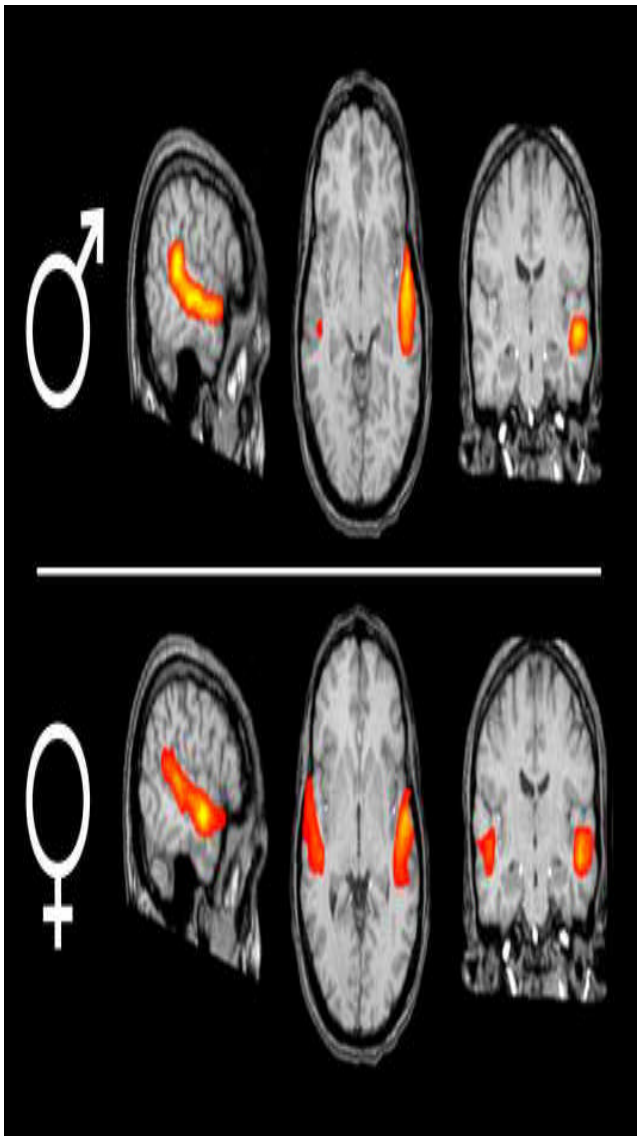
picture next.

Brain areas when talking versus comprehension of spoken language





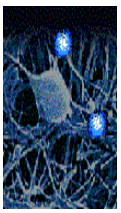
Difference between boys and girls



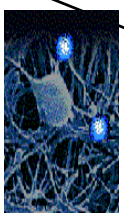
- **Indiana University School of Medecine** Confronto dell'attività cerebrale tra uomo e donna durante la lettura di un romanzo. Ogni immagine è la media di 10 persone osservate con la MRI. In rosso, le zone cerebrali che ricevono un afflusso di sangue durante l'ascolto. Le donne presentano un'attivazione cerebrale molto più simmetrica rispetto agli uomini.

Learning Disabilities: Learning preference

VLD



Information processing:



NLD

Auditory-verbal -
and
Visual-constructive +

Auditory-verbal
and
Visual-constructive

average

Auditory-verbal +
and
Visual-constructive -

Method: first picture
Tekst next

Method: text
And picture

Method: first text
Picture next

Basic instruction

Listen well,
repeat and tell,
I show you a part,
verbalize and start,
use the right order,
and look at the border,
look and tell what’s there,
together we compare,
remember: first comes text,
then picture comes next

Following …

Then we go on with the assignment

Again in the same order:
You listen,
You talk,
I show you,
You watch
I demonstrate,
You imitate

Sequence

- The sequence of instruction is: listening – telling – looking and acting, in accordance with their skills from auditory to verbal, to their deficiencies, which are visual and constructive.
- It is important that the instructions are given slowly and clearly. During the first verbal explanation it is also important that the various parts of the assignment are not immediately visible. This can distract the child from listening.
- Also it is not necessary for the child to look at the tutor because this can also be a distraction.

Tackling the deficits (seeing and acting) with the assets (first hearing and then telling).

- **Basic approach**

1. Hearing
2. Telling themselves
3. Seeing
4. Acting
5. Repeat
6. Combine

- **First text, picture next**

1. Tell them the whole assignment and tell the order of the segments.
2. Repeat briefly the essence and let them repeat it.
3. First show the child everything and then show the segments.
4. Demonstrate – imitate – do it themselves following the order.
5. Verbalize the action; segment by segment until completion.
6. Telling themselves, as a start, with seeing and acting simultaneously, as the ultimate goal.

NLD primary materials

- The materials being used to assist children with NLD have been carefully selected and are aimed at tackling the basic deficits that children with NLD have.
- The perception and attention of children with NLD are very one-sided - directed at auditory-verbal information. Consequently their tactile and visual perception is not practiced automatically. As a consequence, the tactile and visual memory develops poorly.
- Changing this learning style is achieved by training with the primary or basic materials where the materials are first directed at the improvement of the tactile and visual perception and attention, then followed by tactile and visual memory tasks.

The basic materials

- Sensibox stimulates the tactile perception, attention and memory.
- Geo and Panoramix are directed to the visual-spatial perception and attention.
- Children with NLD have great difficulty with part-whole perception. They can learn this step by step with Geo.
- Because they have no visual image of three-dimensionality, the visual-spatial three-dimensional perception needs to be practiced.
- Arithmetic and mathematics refer to the understanding of visual three-dimensional shapes. If this notion is insufficient, systematic mistakes are made when doing the assignments.

Kindergarten

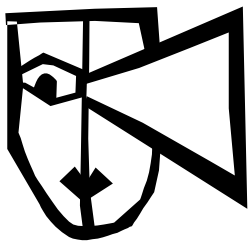
Children with NLD
barely touch
objects
and examine them
insufficiently.

Feeling and seeing objects

- No “internal” image
- Before shapes can be used for arithmetic or can be drawn, they must first know how they feel and what they look like.
- feeling and seeing as a condition for implementation.

Visual memory tasks

- special attention is necessary for the part-whole perception.
- practicing and understanding what it is all about combining and widen the knowledge.
- Overview of the materials



Basic game rules

- The child is not allowed to talk while acting; it is the tutor who speaks.
- Convert actions to speech; mind: numbers are also verbal; number everything and explain the direction: ‘’now I go to the right or left, upward or downward’’.

Basic game rules

- verbalize the actions in the right order
  - (to remember them).
- Before each new start, explain again the next steps:
  - what are you going to do,
  - with what and
  - how.

Basic game rules

- For fine motor and tactile assignments:
  - practice first working with the dominant hand.
  - When the assignment can be done adequately with the dominant hand, have them repeat the assignment using the non-dominant hand.
  - If possible, with both hands at the same time.
  - Teaching this separately is for the purpose of stimulating the integration of working with both hands.

Basic game rules

- First familiar, followed by unfamiliar - novel information.
- ‘’first text, picture next’’.
- With familiar material there is more motivation.
- Children with NLD begin to work when speech is used. So, use speech as a starting point.

- Replace the phrase ‘’you must’’ by ‘’you may’’, this signifies an invitation and not an obligation.

Intervention plans

- Not all channels of information can be used immediately.
- Gradual arrangement.

- The first level is directed at the improvement of the tactile perception and the improvement of the focused attention. Only then, the exercises for the improvement of visual perception are added.
- Reinforcing the visual attention is directed at the improvement of the perception of the total picture.

New tasks

- the intervention plans are arranged from tactile to visual to tactile and visual.
- The increasing degree of complexity of the assignment is determined by the amount of information channels (auditory and/or tactile and/or visual).
- The assignment should be presented first using two channels (auditory-tactile or auditory-visual) and then by using all three (auditory-tactile-visual).
- The match of ‘’first text, picture next” remains the fundamental idea.

First tactile than visual perception, attention, memory

This arrangement is obtained by The sequence of:

1. the touching or feeling game,
2. the guessing game and the
3. searching game.

The interventions

- Start training the sensory input (Sensibox) through feeling the differences between familiar objects followed by unfamiliar abstract objects. The discovering of various shapes and features of objects begins here.
- This is continued through the teaching of the part-whole visual game (Geo) because the piece-meal approach of children with NLD makes it difficult for them to see the whole picture.
- This teaching is then followed by the visual-spatial perception game (Panoramix) where they learn the sequence of color-content and shapes.

Sensibox: improving the tactile perception

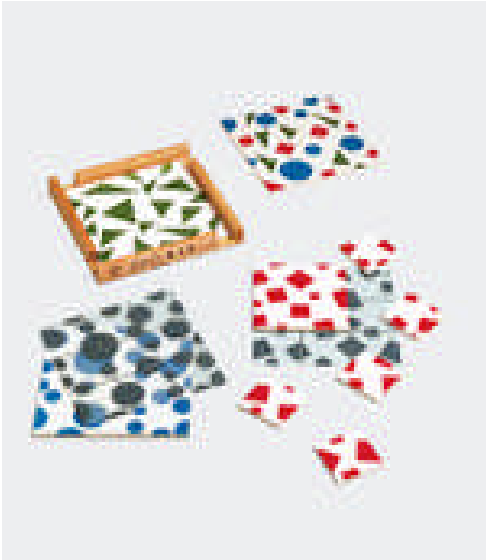
Sensibox materials:

- Sensibox that consists of 5 separate wooden segments fitting together.
- Box with materials to feel with 12 diversified objects and 12 associated cards.
- Box with materials to feel with 10 wooden abstract shapes and 10 associated cards.

- **Learning to feel: training of tactile perception – attention – memory:**
- Using the Sensibox, the child learns to feel from concrete to abstract shapes, working first with one hand – first the dominant hand and then the non-dominant hand – and then with both hands. Starting point: first familiar material, then novel material.

Geo: Improving the part-whole perception

- **Geo puzzle materials:**
- A square wooden storage tray with the name Geo on front.
- Four square puzzles with nine square pieces each.
- Four pattern cards for self-correcting.



- Learn to see: training the visual perception, attention and memory.
- Guiding the child to learn the proper part-whole viewing strategy is essential. Using the Geo puzzle, the child learns to distinguish the separate parts, by naming them and arranging them by sequence of color, shape, number and size. Teaching children to look at the parts in this step-by-step manner, gives them the structure of the whole. The parts are no longer memorized separately.

Panoramix: improving visual-spatial perception

- Panoramix materials:
- One viewing box – box with eyehole and lid – and one white background plate.
- Two wooden stands.
- One cotton bag with thirty-six geometric shapes.
- Thirty-two activity cards.

- Learning how to see: training or the visual-spatial perception, attention and memory.
- They learn to verbalize the visual position and train their auditory-visual performance. After the training of their visual-spatial perception and attention, exercises are performed that help to train their tactile-visual and then their visual-spatial memory.

What, How and Concepts of the materials when learning to see.

- What are we going to do? Place different figures of the activity cards in the wooden stand in the viewing box.
- Materials we are working with? Viewing Box, wooden stands, figures and activity cards.
- How are we going to do it? First text, picture next.

The main switch

- To learn a new viewing strategy asks for courage and reward. It is a huge switch-over where extra help is needed. The world remains the same, but it makes more sense when you can handle the visual supply more easily through your own new trained auditory-visual strategy. All the pictures, figures and shapes become different when they are accompanied with verbal knowledge. Facts help explain how the visual world is set up.

Secondary materials

Kwinto

The main aim of playing with Kwinto is the development of controlled (fine) motor movements in preparation for learning to write.

There are also specific aims designed to encourage the mobility and function of fingers and hands, hand-eye coordination, development of right or left-handed writing preference, relaxed writing motion, spatial orientation and concentration.

Contents:
A beech wood box;
one yoyo;
felt-tip pen, eraser;
a catching cup;
an hourglass;
tiddlywinks;
a soft ball;
a spinning disc;
a box with 50 cubes;
a box with counters;
a small top;
a catching board;
8 assignment cards;
3 counters;
3 pattern cards;
spills;
a round card with a scoring system;

Skribi

With Skribi, children practice hand-eye coordination.

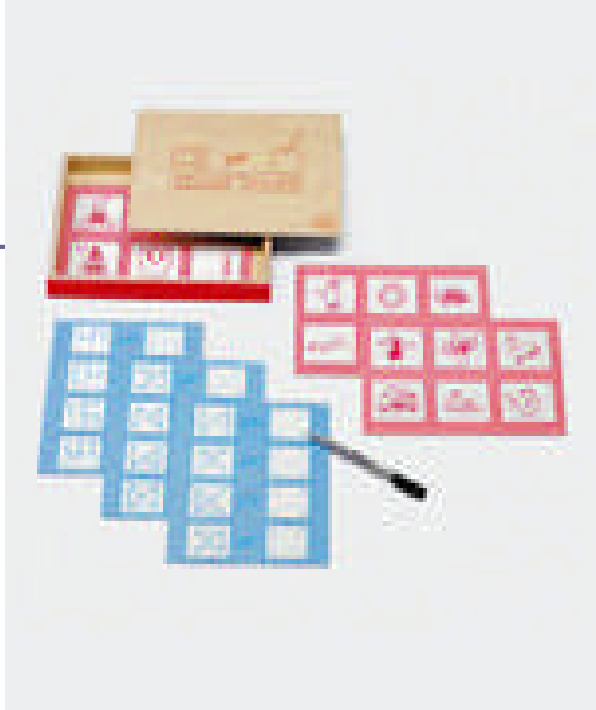
Preparation for writing is developed by making large writing motions on the playing board.

Because of the many ways of playing the game, the child makes different fine-motor movements.

Contents:
A box with a lid. Holes have been bored in the lid - it is used as the playing board.
In the box there are two loose partitions, that the child can affix to the box before play begins; 3 playing cards; 4 transparent trays: 2 large and 2 small ones; 10 marbles in 2 colors; instructions.

Draw What's Missing.

- It is a real challenge to discover where ‘the mistake is’ and…to correct it. The child has to pay close attention when connecting the dots so further mistakes are not made. Good, concentrated visual-spatial observation is developed.
- Taking turns, visual observation, focus on the total representation, on detail and vice versa.
- Through applying logical reasoning, the child’s observations convert to precise motor activities that are used throughout the entire exercise.



- **Contents:**
- A box with lid; 6 cards with 36 exercises: ‘draw the missing items’; 6 cards with 24 exercises: ‘connect the dots’; 1 felt-tip pen (water-soluble); instructions.

Minimemo

- Minimemo helps children develop their visual memory and motor reflexes.
- Children learn to recognize similarities and differences in shapes, colors and sizes, train their memories for objects and develop social skills by playing with other children.

- **Contents:**
  A blue lacquered box; a plastic cover (the game board); 16 small yellow plastic cups; two sets of 16 objects; instructions

Atlantis

- Atlantis is a puzzle of the underwater world.
- The realistic drawings offer many possibilities for discussion and thus, help to develop the child's ability of ''first text, picture next''.
- Many different geometric shapes appear when the child works with the triangular puzzle segments. When put together, they form one large hexagon.

- **Contents:** Atlantis contains 24 triangles. When the puzzle is put together, its maximum diameter measures 52 cm. The wood (MDF) is 0.6 mm thick. The puzzle is packaged in a triangular box and supplied with instructions.

Blocolo

- Using two and three-dimensional materials in a playful manner, by observing, reasoning and doing, the child becomes familiar with the perception of and focuses attention on various geometric shapes;
- re-constructing the assignment card; spatial concepts (behind, in front, left, right, etc.).
- When playing the memory games, the visual-spatial memory is being taught.

- **Contents:**
  1 box with lid; 24 wooden blocks; 4 color cards; 46 assignment cards; 14 assignment strips; 1 cotton bag; instructions.

Careta

Careta teaches children to distinguish and identify basic emotions. This game for 1-6 children also teaches them to recognize and sort items according to two characteristics of facial expression and color.

- **Contents:**
  A box with lid; 40 plastic cards; 1 double die; 6 bingo cards; 1 box with counters; instructions.

Grimas

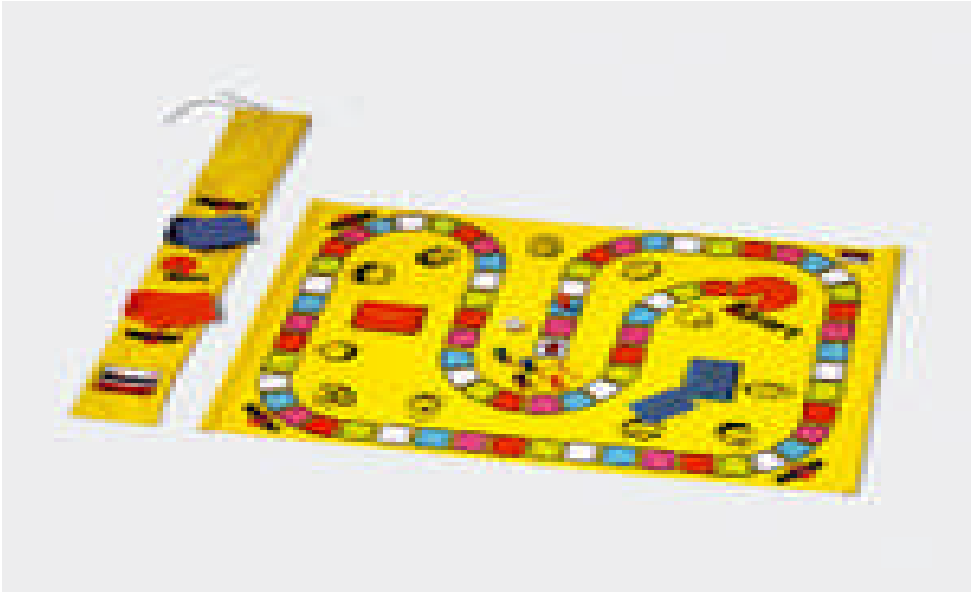
Besides spoken language, facial expressions play an important part in communication.

It is almost impossible to express emotions without them. Grimas is a game designed to help children learn to express their feelings with and without spoken language.

- **Contents:**
  A plastic case; four wooden stands; 30 cards: 25 each with different faces and 5 auxiliary cards; a mirror; five different attributes: a pair of spectacles, a headband, a nose, a pair of earrings and a bowtie; instructions.

The anti-tease game

- The Anti-Tease-Game is made by children and meant for children to make harassment and associating subjects to discuss. The game offers possibilities for the instructor to find out what children think about harassment in a playful way.



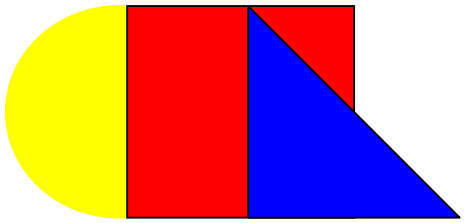
Color and shape

- Differences in color presents shape, and without these differences, we can’t see. The three primary colors: yellow, red and blue are essential in the materials as are the three primary shapes of a circle, a square and a triangle. Knowledge about the combination of shapes and colors helps to integrate them into the new world for children with NLD.

Epilogue color and shape

- Yellow is the color of highest wisdom and deepest insight, red is the color of the earth, the rising sun, our birth, the youth and the spring (Itten, 1961).

- From the material-spatial awareness, red is active and blue is passive, red is warm and blue is cold. Blue is more elusive and attracts our spirit to the distance of eternity, referring to the transparent, not visible heaven. Blue is the color of faith, the transcendent and for the Chinese people, the symbol for immortality.



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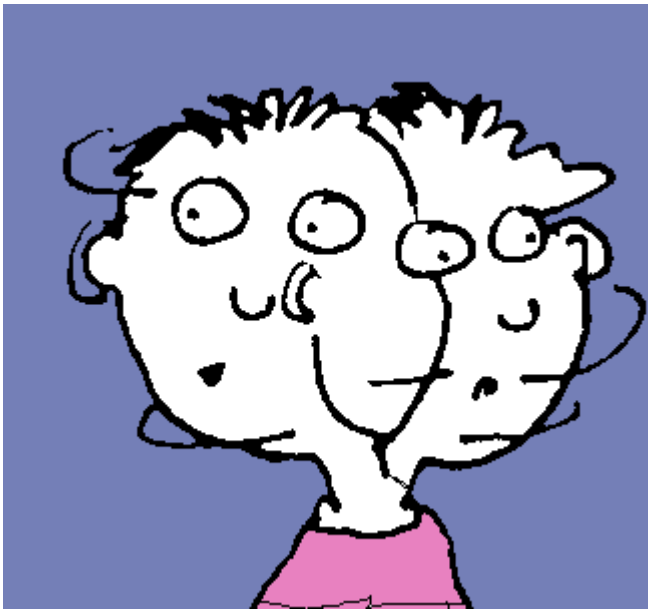

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