

## ***The Learner, Teaching and the Curriculum, Analyzed within Frameworks of Cognitive Thinking.***

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*When the Learner is a dyslectic child, the actual part of curriculum is fluent reading, then learning is complicated and teaching is a challenge. Case Presentation.*

The Learner, Teaching and the Curriculum; this was the headlines for the XI International IACEP International Conference. It could have been a summary of a statement from the former Norwegian professor Magne Nyborg<sup>1</sup>. *A teacher needs to know, first the learning task and what prerequisites would be needed to accomplish it; next, the learner, what is his or her capacities; and if the capacities do not meet the needed prerequisites, how to make conditions for the learner to acquire them.* This appears to be a lifelong project for teachers, a project to which Nyborg left important contributions. His theoretical framework considering learning in general, as well as his Concept Teaching Model, remains to be a step forward in understanding learning and teaching.

The case in this paper is that of the eleven years old boy, Pål. He, the learner, has severe dyslexia, and the actual curriculum is limited to this specific part of it: fluent reading.

### ***The learner.***

Pål has experienced failure in learning to read. We do not know the classroom practice creating his particular learning context, but during the last 20 years, a culture of freedom concerning methods, has been ruling the Norwegian schools. Teaching reading and writing have been rather unsystematic, owing to assumptions that children will learn to read if we give them interesting texts, and introduce the letters to them in a playful way. Of course, there are also language games, rhymes and so on, to influence linguistic awareness. The adult or older children read together with the learner, to facilitate processes like discovering the connection between the letters and the speech sounds.

However, Pål did not learn to read. Instead, he learnt about himself that he could not read like the others, and this caused him a lot of frustration. On a couple of occasions, he ran away from the classroom, and there were episodes when he behaved violently.

10 years old, he struggled reading even two-letters words when the letters ø, y, å were included, for instance by mixing the order of letters or by just saying whatever sounds occurring to him at the moment. He also had severe problems in reading most three-letter words, and consequently severe problems with longer words.

The teachers had some advices saying it would be helpful for him to acquire knowledge for analyzing letters and speech sounds, but they did not have competence in such methods.

LOGOS<sup>2</sup>, a Norwegian test designed to diagnose dyslexia, administered when he was ten, gave result as displayed in Figures 1 and 2.

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<sup>1</sup> Dr. Philos. Magne Nyborg (1927-1996) was professor of the Institute of Educational Research, University of Oslo

<sup>2</sup> Logos Test of Reading Abilities (Norwegian). Logometrica 2006.

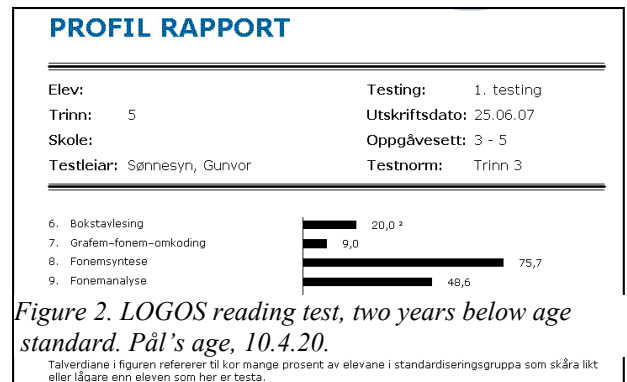
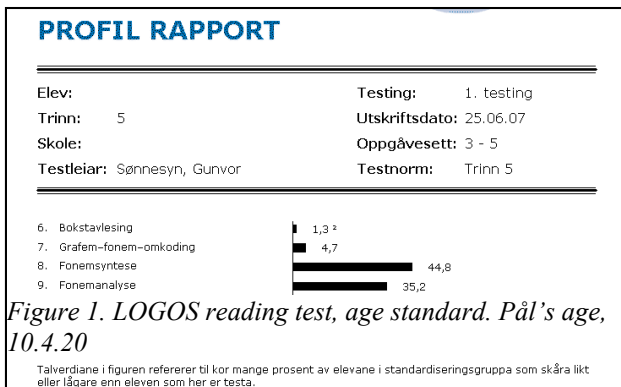
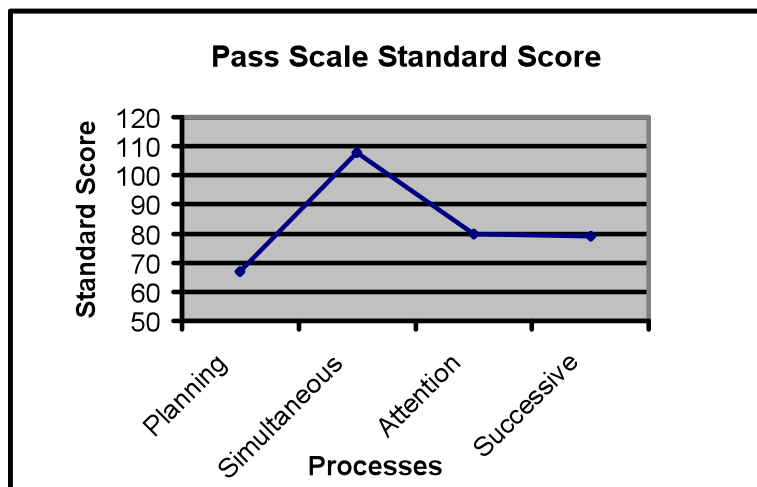


Figure 1 shows the percentile scores with the correct age standard, while fig 2 shows the percentile score compared to two years younger children. The scores are for letter reading (1, 3/ 20 percentile); grapheme/phoneme coding (4,7/ 9 percentile); phoneme synthesis (44/ 75,7 percentile); phoneme analyzes (35,2/ 48,6 percentile); visual analyzes (2,6/ 16,4 percentile). The test administrator had to stop all the tasks comprising word reading.

*CAS, Cognitive Assessment System.*

In addition, the Cognitive Assessment System, CAS<sup>3</sup>, was administered for this child. CAS reflects four areas of cognitive functioning, derived from Luria's works and described in the



PASS theory as Planning, Attention, Simultaneous and Successive Processes. (Das, J.P.; Kirby, J.R. & Naglieri, J. (1994).

The PASS Scale Standard Score Profile clearly shows that Pål has his strength in the Simultaneous Processes. The table below displays values telling that the strength is significant.

Figure 3. PASS Standard Score Profile, Pål's age, 10.5.11

	Standard score	Per-centile	Confidence Interval 95 %	Deviation from mean	Significant deviation
Planning	67	1,4	62-80	-16,5	10,9

<sup>3</sup> The CAS, Cognitive Assessment System (Das & Naglieri, 1997) has so far only a beta-version in Norwegian. The standardisation applied is the American. The Norwegian protocols show the same correlation with the WISC-III as the American sample.

Simultaneous	108	70	100-115	24,5	9,1
Attention	80	9	73-92	3,5	11,3
Successive	79	8	73-88	4,5	9,7
Mean	83,5				
PASS standard Score	76	7	73-85		

Table 1. PASS Standard Scores and analyzes. Pål 10.5.11

Because of the variation between the PASS scores for the different processes, the PASS standard score in this case is not valid as a measure of the persons learning abilities in general.

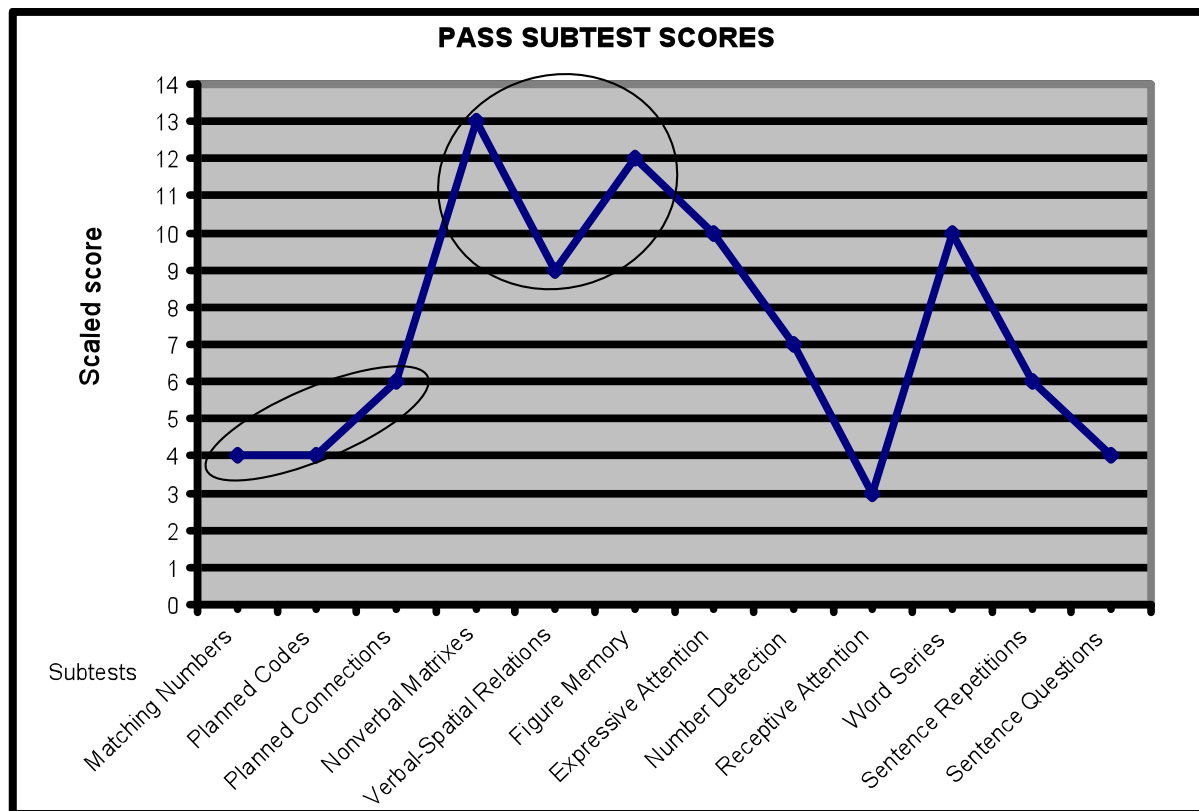


Figure 4. PASS subtest scores. Pål 10.5.11

The scores within each group of subtests differ in variation. While the three subtests measuring attention and simultaneous processes have deviations that prevents valid inferences of these as groups, this is unproblematic for simultaneous and planning processes. It should be possible to conclude, then, that Pål's strength is in simultaneous processes, while he in this situation has a considerably low score in the planning subtests.

	Subtest score	Deviation from Mean	Significant Deviation
Matching numbers	4,0	-0,7	3
Planned Codes	4,0	-0,7	2,5
Planned Connections	6,0	1,3	3
Planning mean	4,7		
Nonverbal Matrices	13,0	1,7	1,9
Verbal-Spatial	9,0	-2,3	2,4
Figure Memory	12,0	0,7	2,1
Simultaneous mean	11,3		
Expressive Attention	10,0	<b>3,3</b>	3
Number Detection	7,0	0,3	2,8
Receptive Attention	3,0	<b>-3,7</b>	3,1
Attention Mean	6,7		
Word Series	10,0	<b>3,3</b>	2,5
Sentence Repetition	6,0	-0,7	2,4
Sentence Questions	4,0	<b>-2,7</b>	2,4

We also see this in the table to the left. There are no significant deviation from a subtest to Pål's mean for the group of subtests in either the planning subtests or the simultaneous. Problems with serial order could account for some of Pål's problems with the subtest Matching Numbers. He confused the numerals containing identical digits but in different order. In addition, the fact that time measure is a part of the test, considerably affected him. This disturbed his performance on the actual subtests, but we do not know to what extent.

For the attention and simultaneous subtests, it is of interest to consider each of the subtests to look for strengths and weaknesses. At a first glance, Pål seems to have strength in the Expressive Attention. Having in mind his severe reading problems, we can suspect another explanation. The task in this subtest is to disregard the written words, the meaning of which is color names, and express the actual color of the letters in each word. This is ordinarily a demanding task, but in this case, it could be easier because of the reading problems.

The score of the subtest Receptive Attention is about four standard deviations below the general mean, and more than two below Pål's mean for this subtest group. This is considerably low, and we must interpret it to be a weakness. What is

Table 2. Subtest Scores and analyzes. Pål 10.5.11

difficult to tell, is the role of his emotional disturbance in such a task, where he is supposed to work with letters, something we already know is very difficult for him. In addition, time measuring, as already mentioned, proved to be a reason for stress and counted for a reduced performance.

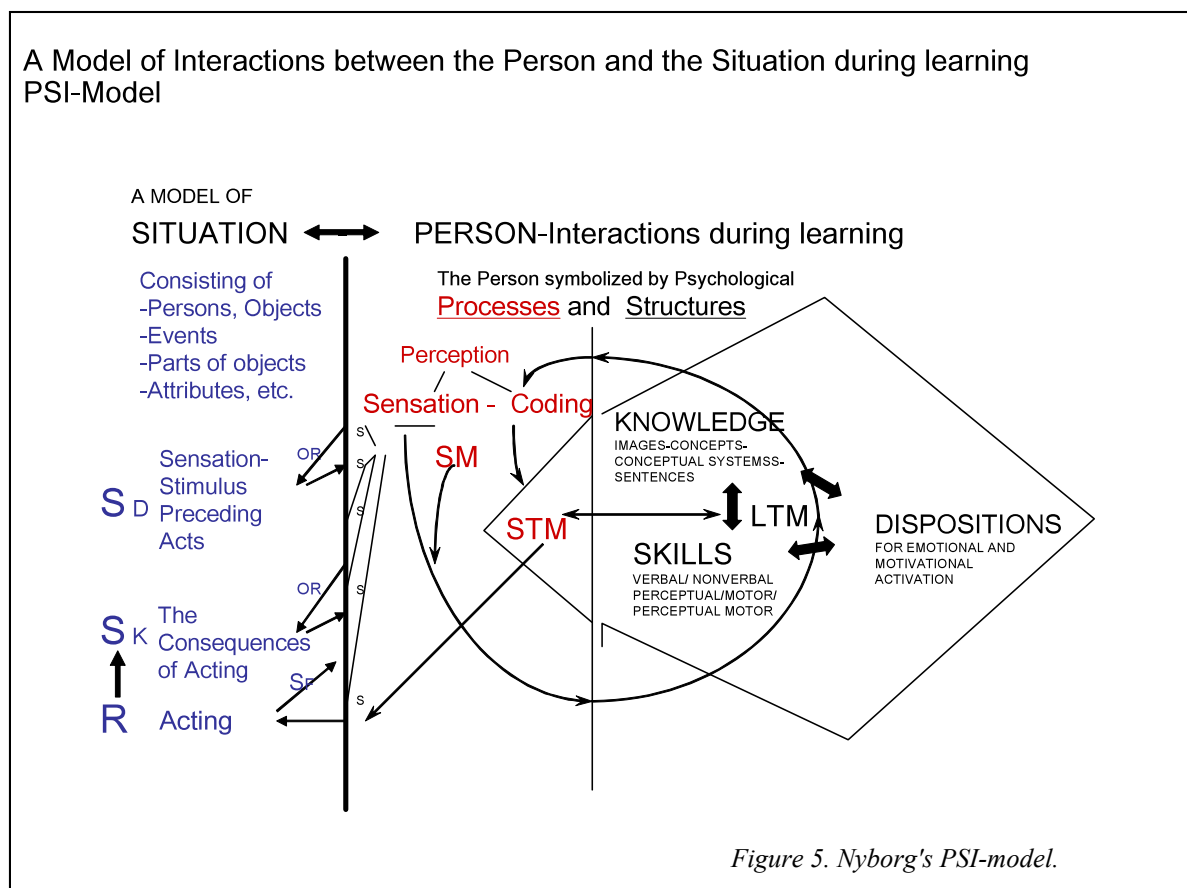
Pål has an adequate score for the Word Series. He has not grasped the structure in the Sentence Repetition and Sentence Question, and seemingly has problems remembering a meaningless series of word. A pedagogical inference could be to suggest the importance of providing the needed capacities for a task he is supposed to accomplish. In successive processing Pål's performance seems to be dependent on working on objectives familiar to him. He needs a context where he knows what to do, and where he has the required capacity to meet the prerequisites for the task.

Therefore, there are reasons to be careful in the interpretation of the latter processes, and look closer to those where we have a certain security that the result tells us about strengths and weaknesses. We need to take advantage of this in our work to create conditions for learning that will contribute for Pål to achieve a capacity to analyze written signs in order to understand them and apply them in his learning.

In some respects, then, we have described the learner. He has a relative strength, not far from a cognitive strength in simultaneous processes. In spite of this, he has not succeeded in learning fluent reading during his first four years at school, not even the part of it that could be considered to be loaded with simultaneous processes. Pål easily is affected by failures and unsuccessful performance; still he meets the world with an open and friendly mind.

### ***Learning and teaching.***

A model of interactions between the learner and his or her context during learning is one of the main building blocks in Nyborg's theory. This model gives us opportunities to do task analyzes (curriculum), process analyzes (learning and teaching) and analyzes concerning the learner and his or her conditions. The model regards knowledge in terms of cognition, skills and dispositions for emotional and motivational activation. From this, important questions emerge. How can we make create a context to establish a basis for perception and experience? How can we apply language as a part of the context, to facilitate learning? Which experiences will contribute to developing capacities concerning cognitions, skills and emotional/ motivational predispositions needed for the task at stake? How can we make conditions to facilitate important learning processes, like attention, sensory memory, short-term memory, working memory, coding, rehearsal, and so on? What cognitions and skills does the actual task comprise, and how can we teach so that positive feelings and motivations are activated?



These, and further questions we can point to some answers to, based in Nyborg's theory and the practice it has become basis for.

Now, let me give a quick reminder of Nyborg's model. Its left part illustrate the context. This is the teacher's arena. All remedies, language use and whatever should be a part of the

learning situation could be included in analyzes of the situation: Persons, objects, parts of objects, properties of objects, relations etc. All practices to be developed would constitute such situations. The middle part gives structure to relations between some important processes, active when learning takes place, like Sensory memory, Sensation, Coding, Short Term Memory. Finally, the left part shows the Long Term Memory Structures Knowledge, Skills and Dispositions for emotional and motivational activation.

This model clearly points out how the LTM structures influence STM and experience/perception, regarding both the content and the organization. It thus displays the impact from LTM on cognitive processing, specially short term memory, and we could add working memory. According to this model, it is obvious that only knowledge represented in LTM can be activated and contributes to coding/ perception and Short Term Memory. What is also important is the organization into hierarchic structures, where super ordinate concepts like furniture or vegetables give another, and more general kind of information than sub-ordered like bookshelf or cauliflower. It is not by accident that answers containing such generalizations give maximum points as word explanation in certain intelligence and linguistic tests.

This reflects a person's organization of his or her knowledge. We easily relate to this issue of organization as something embedded in a person, and fail to see how it is possible to learn, and possible to facilitate the learning of by means of language use. An example of this could be Norwegian children, who regularly help cutting bananas, apples, oranges etc, and serve the other children *fruit*. Children with verbal difficulties often have problems when the task is to classify in super categories, but they seldom fail categorizing exactly *fruits*. This means we should be careful to apply super ordinate categories in interplay with children, and specially when providing learning contexts for children at risk of developing learning problems. This leads us to another crucial process, involved in most learning processes, in Nyborg's literature called analytic coding. We could also apply terms like verbalizing multiple classifications, performing sets of abstractions and so on. A basic level of such analyzes refers to perception – to sense and code whatever could claim my attention, so I can be able to know what it is, that I see, hear, touch, taste. This is in general an unconscious process, just taking place without the person's awareness of it. For some persons, however, it does not always take place, or it does in a restricted manner, less useful for mental processes than it could be.

In my own practice, I have regularly seen that the analytic coding is a task possible to learn, even for persons with mental retardation. Particularly the raised skill for analytic coding makes a difference in the persons learning style. The super categories mentioned above facilitate this process in respect of directing attention to feature after feature concerning the item in focus for one's attention. This leads us to the distinction in Nyborg's literature between two main groups of concepts; concepts of whole objects, events, or phenomena, to include whatever; and concepts comprising parts and features of them. The latter he labeled basic concepts, and he explored how they are important in different kinds of learning.<sup>4</sup> These basic concepts or analyze concepts, as we could label them as well, constitutes exactly the prerequisites for the analytic coding processes.

Another important issue made clear in the model is the differentiation of the Long Term Memories into Knowledge, Skills and Dispositions for Emotional and Motivational

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<sup>4</sup> This is nothing new; rather it is something understood and written about centuries ago. Thomas Aquinas is one of those whose writings also currently are easily accessible, and who points to this distinctions and their consequences for human thinking, all with reference to Aristotle and his *Categories*.

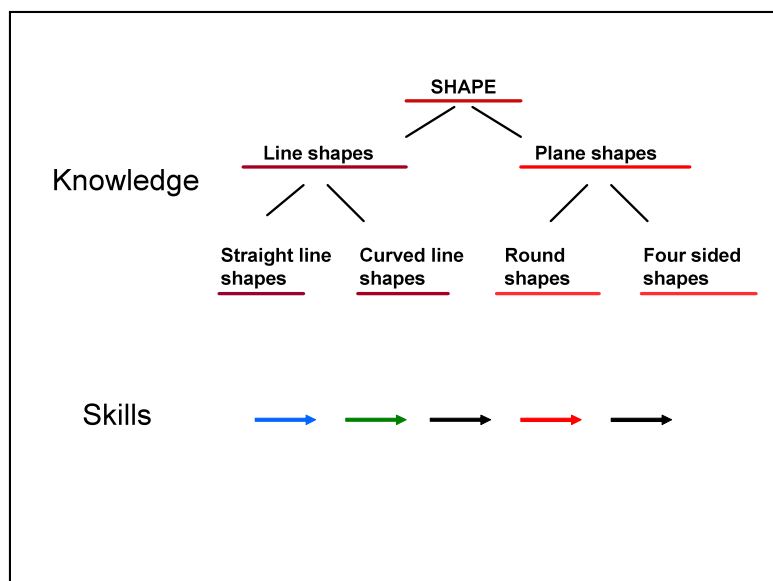


Figure 6. Knowledge and Skill Structures.

Activation<sup>5</sup>. The arrows indicate the interactions between them, for example the fact that the emotional or motivational factors can overrule Skill performance, Coding and Short Term Memory as well as other mental processes. When we talk about the Skill of Fluent Reading, it is proper to focus the Knowledge, specially needed in the learning process, and the Skill Structures. While the Knowledge has, as already mentioned, a hierarchical structure, Skills are organized in sequences. We could express performing a skill

in terms of carrying out a set of movements or acts in a fixed sequence. That would be correct if we talked about a perceptual skill like recognizing a landscape you pass when driving a well-known distance, as well as if we talk about pronouncing speech sounds in a sequence when we say a word, or of skills in general. Learning a skill, then, comprise knowledge of each item in the sequence as well as the order of it. In this part, the learning prerequisites consist largely of knowledge, often with this kind of learning achieved by observing other persons performing the skill. The next step is to exercise and revise, and then further exercise until the skill has become automatic.

### ***Curriculum, in Respect of the Learning Objective Fluent Reading.***

We are moving from the process analyzes to analyzing the task. When the task is Fluent Reading, there must be numerous sub tasks regarding learning the letters, the speech sounds, the connections between them, sequences, words spoken and written, the meaning of them and so on.

The following table views a number of conceptual systems and concepts being an important part of such sub tasks, also possible to be regarded prerequisites for learning fluent reading. They are all possible to recognize as basic concepts or concepts for analyzes in general.

<b>Basic Concepts for Reading and Writing Learning Processes</b>		
<b>Conceptual Systems</b>	<b>Concepts</b>	<b>Analyzes and Comments</b>
Shapes	Round shapes Curved shapes Straight line shape Angle shapes	Parts of/ whole letters have round shapes. Parts of/ whole letters have curved shapes. Parts of letters have straight-line shapes. Parts of/ whole letters have angle shapes.
Positions	Horizontal position Vertical position Sloping positions	Parts of/ whole letters have straight lines in vertical, horizontal or sloping position.
Sizes/ heights	Larger size related two	Basis for discrimination of "small" letters from letters having smaller size related two

<sup>5</sup> This thorough expression state also the differentiation between the memory structures and the activation of them. The Knowledge, Skills and Dispositions are stored, but only in a relevant situation they are activated into coding systems and acts of numerous kinds.

Concepts of Relations	Larger height related two	each other. Parts of/ whole letters has a straight line in vertical position with a large height related to ...
Place	Place on the left side of Place on the writing line Place first in a row Last place in a row Second place in the row Place in the middle of the row	Parts of letters has place on the left side of... (The letter d has the number two parts. One part has straight-line shape in vertical position; the other part has a round shape and place on the left side of the vertical line.... Letters has place on the writing line/ cross the writing line. The speech sound, "s", has place first in the word "sun" (spoken). The letter s has place first in the word sun (written). The speech sound, "n", has last place in the word "sun" (spoken). The letter n has last place o the word sun (written). The speech sound, "ʌ", has the second place in the word "sun". The speech sound, "o", has place in the middle of the word "sun".
Direction	Direction upwards/ downwards Direction down to the right/ left Direction from left to right	The letter U has a curved shape. The opening has direction upwards. The letter k has the number two parts. One part has a straight-line shape in vertical position, large height (related two e) and place on the writing line. The other part has an angle shape, the opening to the right, the tip has place against the vertical line a little below the middle. Reading direction is from left to right.
Whole/ part of whole		The letter d has one part with a straight-line shape and another part having a round shape. Speech sounds are parts of whole words. Letters, graphemes, (ng, chr, ch, wr, ie etc.) and syllables are parts of whole words.
Number	Number of parts	The letter d has the number two of parts. The word sun has the number three of letters. The word, "sun", has the number three of speech sounds.
Sound	Speech sound	The word, "sun", has the number three of speech sounds. The letter o are symbol for the speech sound "ou" (or the speech sound "ʌ").
Changes	Changes in shape, place, number, sound, position, height etc	First I say "car", then I say "cars". Then I have changed the number of speech sounds, word length, and the exact meaning of the word. First I write <b>a</b> . Then I change the height of the vertical line, and make it a <b>d</b> .
Symbols	Letters as a symbol of speech sounds Words as a symbol of the meaning (category members)	The letter t is symbol of the speech sound, "t". The word, "apple" is a symbol of a real apple.

Table 3. Conceptual Systems; Prerequisites for learning reading skills.

In Norway, there is a strong belief that you learn to read fluently by reading. Thus, the teacher's assignment is to provide a variety of books and booklets, and give the children motivation for reading. What one can easily forget, is the, at least for some children, huge task of learning preceding the step where reading materials is the objective.

We talk about cracking the code. We should be careful to reveal the code, provide conditions for the children to know to an automatic level the letter/ speech sound combinations, which is not, neither in Norwegian nor in English a one-to-one correspondence.

In USA, we can see that the National Reading Panel through research and publications has an impact on this. The term *phonics* makes it an issue, and raises the consciousness on this important part. In Norway, only one of the newer schoolbooks for learning reading and writing works systematically both with speech sounds and letter analyzes.

Learning how to read does, as learning skills in general, comprise several phases. The first have been labeled the cognition phase in several approaches. (Nyborg, 1985, 1989, 1994 I,



Downing 1979, 1984) For reading, the cognition phase of the Skill Learning must include learning the letters, the speech sounds, and the correspondence between them. It includes learning about sequences, as both speech sounds and letters occur in sequences when they construct a word. It must also include learning about symbols, as both spoken and written words and sentences symbolize meaning of different kind, while written words also symbolize spoken. All this is included in the table above.

### ***The Learner and the PSI Model.***

We have applied the PSI Model as a tool for analyzing prerequisites for learning to read. We have earlier analyzed Pål's capacities, and described his abilities in terms of test scores. Now the intention is to apply these analyzes in order to provide tools for Pål to overcome his problems to learn reading. The PSI Model also offers a framework for analyzing Pål's capacities, and see whether they meet the prerequisites needed for this task. Pål fails in remembering the letters, and easily connect them to speech sounds. It seems evident, that his initial "learning how to read", has not provided for the needed prerequisites. We can presume that he knows that the written words are supposed to carry some meaning, but he is confused about how to stick to them in order to code and understand. Before it will make sense to train reading skills, we must provide him requisites in terms of basic concepts. While the CAS tells us about Pål's strength in simultaneous processes, the numerous conceptual systems derived from the PSI-Model shows, which concept and conceptual systems Pål will need to be able to be able to transfer his work, primary with letters, into simultaneous processes. He needs tools to verbalize similarities and differences, and make careful analyzes in order to better distinguish between the letters, and hence remembering them. Next steps will be to work with graphemes, speech sounds and words in the same way.

### ***Teaching.***

Pål needed to learn the actual concepts, and we had to secure the success of this learning. We could not afford another experience of failure in Pål's learning history regarding learning fluent reading. More than any other method I know, Nyborg's Concept Teaching Model (CTM) has proved to give children with a diversity of learning conditions the prerequisites demanded by the several learning tasks stated in the curriculum (Bócsa, 2003; Nyborg m. fl. 1985 II; Nyborg 1989, 1994 II; Hansen 1998, 2001, 2007; Sønnesyn 2005, 2006). This model was applied during an intervention period with Pål, where the intention was to have a teacher at the sideline during the lessons, to make it possible for him to follow up and take over. The latter was, owing to several circumstances, not successful, but I will still report the work actually carried out.

Let me first give a brief presentation of the CTM-model.

### **Nyborg's CTM-Model.**

Nyborg identified three phases of concept learning, besides the more global mental process, analytic coding, as mentioned before. These processes are all reflected in the CTM.

#### **1 Selective Associations.**

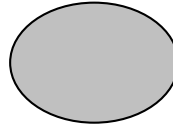
In this phase, the children learn to associate the phrase naming the category with one after the other of phenomena belonging to the category. Thus, it is a particular association we provide in this case, hence the label Selective Associations.



*The edge of the lid has a round shape.*



*The dart game has a round shape.*



*This figure has a round shape.*



*The clock face has a round shape.*

These are examples of things we could use to provide good conditions for the children to learn the concept of round shapes. As a reader, you must be satisfied with the picture of things. The children need to experience real things in a learning situation like this. Every child must get the opportunity to manipulate the round shape, let a finger follow the edge round and round, and express: "It has a round shape". That means we will have to use a lot more things than presented here. In addition, the children could make round shapes of pipe cleaners, paper cutting, drawing and painting; make round shapes with their bodies, or what else we could think of. Notice that we try to find objects familiar and attractive to the child, to gain power from his or her motivation.

## 2 Selective discriminations or learning of differences.

In this phase, the children learn to distinguish between objects that belong to the category, and objects that do not.



*Can you point to the figure having a round shape?*



*Can you point to the figure having a round shape?*



*Can you find a round shape, on the ladybird's back?*

a k

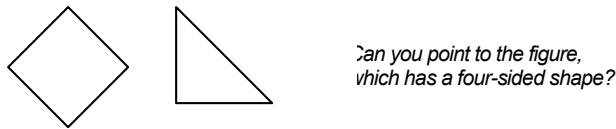
*Can you point to the letter having a part with a round shape?*

We present two objects, and the task is to point out what belongs to the category we work with. The children must verbalize; "I take this one, because this has a round shape". The first task is simple, as the figures do not have other features that they will have to disregard. For the task with the ladybird, the discrimination is to discern between the round shapes and the rest of the entity. Like in the association phase, it is important that every child get chances to pick out the item belonging to the category and verbally express it.

It is an issue in this phase to prepare for the children discriminations between items that is easily confused. That will help them discriminate and disregard features they could believe should belong to the category, and vice versa, to include what they could easily exclude. There are good reasons to present items we know often appear as misunderstandings. The next task illustrates this for the concept of the four-sided shape. Many children would not recognize a four-sided shape in that position as a four-sided shape.<sup>6</sup> By presenting it like this,

<sup>6</sup> Aston Index, a test still frequently used in Norway name the four-sided shape in this position "routes", and in that way abandon the mental connection between the different four-sided shapes, instead of strengthening it by using the language in another way, facilitating the discovery of this coherence.

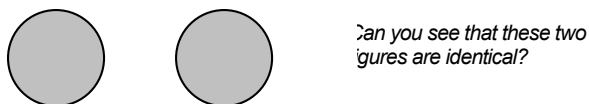
the children are compelled to include it in the category four-sided shapes. Notice that this belongs to another concept than the examples above. It is mentioned here to illustrate the process, but for the children we apply it when we work with the concept of four-sided shape, or when we meet a child who has this misconception.



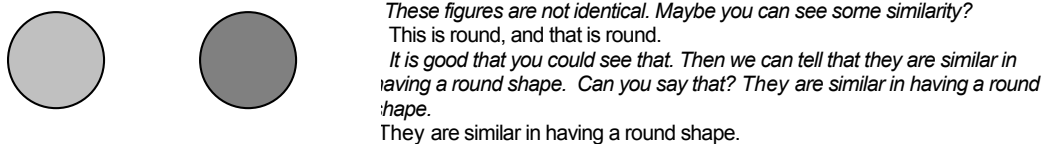
### 3 Verbally Conscious Selective Generalizations.

In the third phase, the issue is to arrange tasks allowing the children to verbalize the partly similarities they started to discover already in the phase of association.

When you start applying the Concept Teaching Model with a new group of children, it is wise to include a task with identical items here, to demonstrate the difference between identical and partly similarity. Below, we demonstrate this. Again, we offer just pictures, reminding the importance of providing concrete experiences for the children. In this case, the concrete things could be two identical plastic pieces.

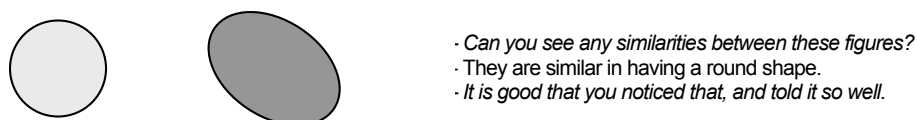


When we have noticed the total similarity, we continue with two figures similar in shape, but with different colors.

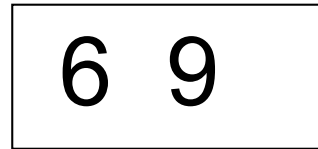
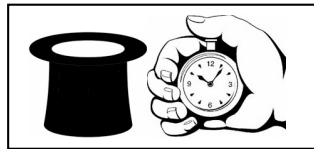


This small dialogue shows how the children often will answer such a question, and how we can guide them a step forward towards the verbal consciousness implicit in the expression: "they are similar in..."

A more complicated process underlies the discovery of similarities between the next figures.



Additional tasks could be to find similarities between the next figures. Every box has a new task.



All the children in a group will have to verbalize the similarities they have discovered. We also must praise other similarities they find, but then lead them further, or realize that we have not done our job well enough.

The verbal consciousness implied in the expression: "they are similar in.." showed in Nyborg's research to be a crucial issue for the learning processes. The same expression sounds odd in the ears of many adult persons. Someone responsible for other person's learning must make his or her own decisions about the priority of considerations. The experience is that utterances like this do not influence the children's language in an artificial way, rather contribute to enhanced and increased verbal activity.

In this case, we know from the CAS that Pål has strength in simultaneous processes. The better reason there are to arrange conditions that systematically give him the opportunity to take advantage of this in his learning. I have already pointed out several concepts needed for analyzes concerning letters, speech sounds, written and spoken words. To learn these was the first "curriculum".

Unfortunately, it was not possible to do this work as systematically as ideal. However, Pål learned the most crucial of the concepts, and applied them in analyzes for example in games like ANNA, a lotto game where he had to direct his attention to shape, color, number, size etc. of the figures, or what I use to call "changing sheet", both displayed below.

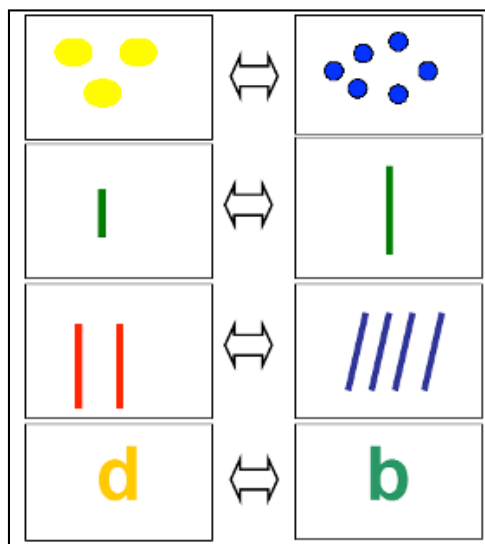


Figure 7. Comparison sheet. Look at two figures connected with an arrow. In what respects are they similar? In what respect are the right figure changed?

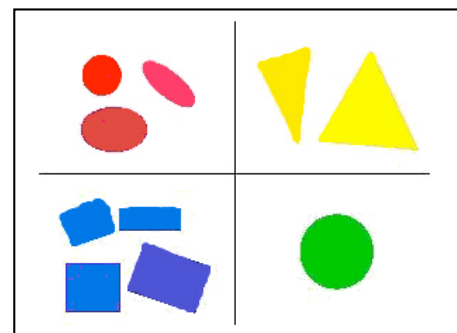
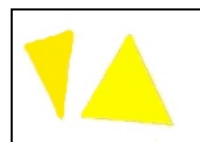


Figure 8. ANNA game.

"Who has the figures with triangular shape, the colour yellow, and the number two?"

"I have the figures with triangular shape, the colour yellow, and the number two".

These tasks he very soon performed well, and with joy. When a similar game consisting of letters came on the table, he was initially less able to perform the analytic coding, but after playing it some times, he became aware of the different parts of the letters, their shapes and several relations to each other concerning size, place, position etc. Everyone could be impressed by listening to his description when hiding a letter in his hand: *“It has three parts; two has a straight line shape with a vertical position, one of them has a large height compared to the other, and between them there are a curved shape with it’s opening downwards”*. One should have some experience in this type of analyzes to immediately answer h.

This is not common knowledge among teachers in Norway, and not easy to mediate to a teacher. Consequently, instead of the teacher taking over this kind of intervention, it was limited to a lesson three times a month for two months when I was able to work with him.

As soon as he grasped this way of analyzing letters, we started to analyze parts of words and words, in order to automate the connection between graphemes and phonemes, like ng immediately coded as “ng” or fr as “fr”.

We worked with it in games in the same way as the letter analyzes. Below there are examples of Comparison Sheets and cards from LOTTO game designed for the purpose.


frog	↔	
frog	↔	frog
frog	↔	fry
frog	↔	rfog

Figure 9. Comparison sheet (1) for work with the grapheme fr.

free	↔	FREE
free	↔	fere
free	↔	reef
free	↔	tree

Figure 10. Comparison sheet (2) for work with the grapheme fr.

free	Look at the word to the left. Write a word to the right. Use two of the same letters. You decide the rest.	
fry	Look at the word to the left. Write a word to the right. Use the same color. You decide the rest.	
FRED	Look at the word to the left. Write a word to the right. Use the same number of letters. You decide the rest.	

Figure 11. Comparison sheet (3) for work with the grapheme fr.

frog	tree
free	from

“Who has the word *free*?”  
 “ I have the word *free*”.

For the last two years, school has provided texts to read for Pål. Teachers have tried hard to find proper texts, at the fitting level, and with a certain interest. This has not been successful. Pål still will need to work with words in several ways, and the best would be to design also textbooks for him, where words he has graphic representations for in his mind are present.

What we see after this period of intervention, is that Pål now reads four letters – and longer words, and he has automatic a number of graphemes. There is still a distance to pass before

Pål has learnt fluent reading. He is on his way, and the steps he has taken give promises for the following. The challenge is for the teacher to analyze as carefully as necessary the task, and provide the best conditions for learning in each part of it. The training must be on the level where the child actually is, hence training word reading when the child is on the level where he needs to analyze letter by letter, could be a catastrophe, like in Pål's case. Vice versa, to keep a child on a level where he or she no longer is should be considered a crime. It is important, then, to point out that for most children we do not need to work as systematic as in this case. What we should feel obliged to, however, is initially to give conditions for learning that also take care of children like Pål<sup>7</sup>.

In a case, it is possible to point to important aspects, and to suggest some connections. It is not possible, though, to draw conclusions about causality. That reveals a need for research concerning these methods.

#### Litterature.

- Aquinas, T. (1995). *Om væren og vesen*. Vidarforlaget akademibøker, Oslo.
- Aquinas. *S.T. 1a Quaest. I, art. IX*.
- Aristoteles (2004) *Categories*. Translated by E.M. Edghill.  
<http://etext.library.adelaide.edu.au/a/a8/categori.html>.
- Aristoteles (2004). *On interpretation*. Translated by E.M. Edghill.  
<http://etext.library.adelaide.edu.au/a/a8/interpret.html>.
- Aristoteles (1986). *De Anima (On the Soul)*. Penguin Classics, Penguin Books Ltd., London.
- Aristoteles. *Posterior Analytics I, 35*
- Bócsa, E. (2003). *School Adjustment of Borderline Intelligence*. PhD, Babes-Bolyai University, Cluj.
- Das, J.P., Naglieri, J. & Kirby, J. (1994). *Assessment of Cognitive Processes: The PASS Theory of Intelligence*. New York: Allyn & Bacon.  
by [J. P. Das](#) (Author), [Jack A. Naglieri](#) (Author), [John R. Kirby](#) (Author)
- Downing, J. (1979). *Reading and reasoning*. W. & R. Chambers.
- Downing, J. (1984). *Task awareness in the development of reading skill*. In: Downing, J. & Valtin, R. (ed): *Language awareness and learning to read*. New York: Springer Verlag.
- Hansen, A. (1998) A report from the field: Concept teaching and the application of a Concept Teaching model as a strategy to prevent and reduce learning disorders. *The thinking teacher. A journal of Cognitive Approaches in Education*. Vol. XIII Number 1, August 1998.
- Hansen, A. (2001). *A study of the effects of concept teaching for children with learning difficulties* (undertaken 1998-2000). Paper to the 8th International IACE Conference Finland Tuesday 12 June 2001.
- Hansen, A. (2007). *Begreper til å begripe med. Effekter av systematisk begrepsundervisning for barn med lærevansker på målområder som angår læreforutsetninger, fagfunksjonering og testresultater*. Institute for Education, Tromsø University.

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<sup>7</sup> It would be relevant to mention that Norwegian schools now have available textbooks for initial reading learning, and follow ups throughout primary school, where the CTM is applied in beginner's reading as well as in grammar and spelling in higher grades.

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- Hansen, A.; Hem, M. og Sønnesyn, G (2002). *A strategy of concept teaching and a Concept Teaching Model*. Project INSIDE/ Down Syndrome Educational Trust, South Sea, UK.
- Kirby, J.R. & Williams, N.H. (2000). *Learning Problems. A cognitive Approach*. Kagan & Woo Limited, Toronto.
- Luria, A. R. (1973). *The working brain*. Harmondsworth, England: Penguin
- McNamara, R (1994). Knowledge representation. I Sternberg (ed): *Thinking and Problem Solving. Handbook of Perception and Cognition* (s 83-117). Academic Press, San Diego.
- Naglieri, J. & Das, J.P. (1997) *Cognitive Assessment System* . Riverside Publishing
- Nyborg, M. (1985). *Læringspsykologi i oppdrags- og undervisningslære*. Nordisk Spesialpedagogisk forlag, Haugesund.
- Nyborg, M. (1985). *Endring av barns språklige læreforutsetninger*. Nordisk Spesialpedagogisk forlag, Haugesund.
- Nyborg, M. (1989). *Barn og unge med generelle lære- og språkvansker*. Norsk Spesialpedagogisk forlag, Haugesund.
- Nyborg, M. (1994 I). *Pedagogikk*. INAP-forlaget, Asker/ Kvam
- Nyborg, M. (1994 II). *BU-modellen*. INAP-forlaget, Asker/ Kvam
- Nyborg, M. ( Red.) (1994 III). *Økt frihet til å lære*. INAP-forlaget, Asker/ Kvam.
- Nyborg, R.H. (1983). *Frihet til å lære ved å lære: Barns læreforutsetninger endret ved bruk av en begrepsundervisningsmodell*. Statens Spesiallærer-høgskole, Hosle.
- O’Callaghan, J.P. (2003). *Thomist Realism and the Linguistic Turn. Toward a More Perfect Form of Existence*. University of Notre Dame Press, Notre Dame, Indiana.
- Peirce, C. S. (2003) On a new list of categories. *Proceedings of the American Academy of Arts and Sciences* 7 (1868), s 287-298. [www.peirce.org/writings/p32.html](http://www.peirce.org/writings/p32.html)
- Sønnesyn, G. (1999). *ANNA begrepslotto*. Be-Ma forlag, Pedverket, Voss
- Sønnesyn, G. og Hem, M. (1996). *Grunnlaget*. Undervisningsperm for begrepsundervisning. Be-Ma Pedverket, Voss.
- Sønnesyn, G. og Hem, M. (1999). *Grunnlaget*. Learning Programmes for Concept Teaching. Be-Ma Pedverket, Voss. Supported by the European Union.
- Sønnesyn, G. (2006). *Good practices for integration and inclusion*. Paper, INCLUES Network International Conference: “Good practices for integration and inclusion”, Rome.
- Sønnesyn, G. (2005). *Principles of Cognitive Education – some Basic Cognitive Processes. A brief presentation of some learning principles basic to Nyborg’s Model for Concept Teaching*. Paper, INCLUES Network International Conference, Prague.
- Vygotskij, L.S. (2001). *Tenkning og tale*. Oslo, Gyldendal Akademisk.
- Vygotsky L.S. (1962). *Thought and language*. Cambridge, Massachusetts, The M.I.T. Press