No matter what language -
no matter what country -
no matter what age -
dyslexia is everywhere.

European Dyslexia Association
DYSLEXIA 3-LEVEL FRAMEWORK
by Utah Frith

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Kummits, N. (1938) Lambi valgel
In the Light of the Lamp
Oil on Canvas
National population censuses in Estonia

Literacy: reading and writing

1881 – 42.7%
1922 – 90.6%
1934 – 93.6%
2000 – 99.8%

Excellent results in PISA 2009.
3th position in Europe
10th position in OECD
13th position in world
Kummits, N. (1938) Lambi valgel
In the Light of the Lamp
Oil on Canvas
Current presentation:
1. Brief overview about different theories in dyslexia
2. 3-level framework by U. Frith
3. Some implications

References are available in the end of the show.
Definitions

- International Dyslexia Association's Board of Directors, November 2002.

“Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.”
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- **The social model of dyslexia** emphasises the role of society in limiting those with specific learning difficulties as well as recognising the talents and strengths that are often present.
Different theories about dyslexia

1. The Phonological Deficit Hypothesis
2. The Double Deficit Hypothesis
3. General Senso-motor Deficit Hypothesis
4. Magnocellular Deficit Hypotheses
5. The Automatisation Deficit Hypothesis / Cerebellar Deficit Hypothesis
Does it seem like that?

"Blind monks examining an elephant"
Hanabusa Itcho (1652–1724)
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• Different theories present dyslexia at different levels.
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• Different theories present dyslexia at different levels.

• Need for broader approach:
  - integrate existing theories
  - neutral and more broad framework
  - include environment: culture, education, language, social, economy
  - holistic way
  - social model
• U. Frith 3 level framework of dyslexia since 1995

• Brief history and references:

  • ... years of researches, new knowledge, publications ...

Utah Frith theoretical framework consists 3 level:

BIOLOGICAL

COGNITIVE

BEHAVIOURAL
Utah Frith theoretical framework consists 3 levels:

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>BIOLOGICAL</td>
<td>genes, brain, hormonal condition</td>
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<tr>
<td>COGNITIVE</td>
<td>pre-reading, pre-reading processes for reading</td>
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- what dyslexia is and what is not
- co-incidences
- remedial and supporting effects
- environmental influences and holistic approach
- suitable to describe developmental diversities
Frith, U., Ramus, F.
Utah Frith theoretical framework consists of 3 levels:

- **BIOLOGICAL**
  - genes, brain hormonal condition

- **COGNITIVE**
  - pre-linguistic processes for reading

- **BEHAVIOURAL**
  - reading and related behaviour
Biological level: genes, brain cortex, laterality

1. chromosomes consist of missing or malfunctioning genes
2. discrepancies in the brain size, structure of functioning, reduced activity
3. significantly less magnocells in visual and auditory pathways

COGNITIVE difficulties
1. in multisensory timing processes
2. in automatization, sequencing and timing
3. in processing fast sequencing stimuli
4. in motor and balance, unfluent movements

BEHAVIORAL permanent difficulties in reading
Can we intervene at biological level in the libraries?
Utah Frith theoretical framework consists of 3 levels:

- **ENVIRONMENT**
  - **BIOLOGICAL**
    - genes, brain hormonal condition
  - **COGNITIVE**
    - pre-linguistic processes for reading
  - **BEHAVIORAL**
    - reading and related behaviour
Cognitive level:

Difficulties in:
- visual perception → orthography
- auditory perception → speech perception, phonological awareness → reading skills
- space and rhythm: speech, writing, movements, kineasthetic and kineatic processes, general and fine motor
- motor perception and control
- short term memory, long term memory
- speech and language:
  - phonological awareness and processing
  - poor alphabet knowledge
  - poor grapheme-phoneme knowledge
  - difficulties in lexical aspects (slow retrieving)
- poor information processing
- poor executive functions:
  - automatization, - sequencing, - timing
Summary so far –

these readers are not stupid or lazy

as they are often recognised.
Can we intervene at cognitive level in the libraries?
Utah Frith theoretical framework consists of 3 levels:

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- **COGNITIVE**
  - pre-linguistic processes for reading

- **BEHAVIORAL**
  - reading and related behaviour
BEHAVIORAL LEVEL: permanent difficulties in reading

Always:
1. poor decoding performance: omission, addition, substitution of phonological units
2. poor reading comprehension

Features that may or not may occur:
- poor naming speed
- poor speech development
- grammatical and lexical deficit
- poor verbal processing: perception, memory
- poor time estimation
- poor motor and balance
Can we intervene at behavioral level in the libraries?
BEHAVIORAL LEVEL: permanent difficulties in reading

Decoding:
1. Mistakes, beside verbal speech
2. Slow reading process
3. Guessing reading
4. Whole word reading, omissign of the suffixes, postpositions
5. Line loosing, word omission

Reading comprehension
1. Imprecise comprehension
2. Difficulties in finding and remembering details
3. Difficulties in learning via reading: new terms, sequencies, details, ...

Reading behaviour
1. Avoidance reading activities: games, instruction, subtitles, etc
2. Avoidance loud reading
3. Headache, eye-ache, get rapidly tired

NB! Additionally may occur:
Difficulties in self order, self managing, planning, putting priorities, finalising and promoting

All this (may) have impact on personal development, self esteem, socialisation, ...
Can we intervene or take account in this?
Readers with dyslexia present a lot of special features.

Only weaknesses?
Do dyslectics have any strengths?
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Good or excellent:
- Non-verbal abilities
- Visual abilities
- Spatial abilities
- Alternative thinking
- Curiosity, creativity
- Intuitivity
- Whole perception, whole language approach
- Visual problem-solving
- Mind mapping
- Social skills
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as resources for future education, social coping
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as ressources for future education, social coping

They rather listen than read,
rather speak than write.
Getting close to environmental level, social aspects and holistic approach

- Current situation
- instead *What is dyslexia*
- current question is *Where is dyslexia?*
Getting close to environmental level, social aspects and holistic approach

• Current situation

Instead What is dyslexia

current question is Where is dyslexia?

• Answer is:

Dyslexia is in value judgements, attitudes,
measurements, assessments,
in environment, in society
Environmental level and holistic approach

The role of environment and society:
• Access to services
• Flexible arrangement of services, universal design
• IQ versus the other options
• Beside weaknesses identify and handle strengths
• Impact of the new visual media and ICT, advantage for dyslectic people
Library as option to practice and master learned literacy and social skills

What we can do?

1. Little or few accommodations in environment and print presenting: text and pictures, size, color, font
2. Alternative methods (non verbal) in information presenting, communication
3. Appreciate every readers even small advantages
4. Trust your readers
5. Avoid learned helplessness
6. Make safe and enjoyable atmosphere
7. Be creative to combine different methods, ways.
Library as option to practice and master learned literacy and social skills

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Never forget - for dlx readers - getting to the library means getting to the lion gave.
In more concrete way

Arrangement
1. Introduce your library rules, make it visible in different way
2. Devide the information (written and spoken) into smaller pieces
3. Structure the information, devide the information into clear blocks, provide unambiguous start and final.
4. Use unambiguous sentences, support by body language
5. Provide time to react and reflect the information for readers.
6. Be sure that reader understands and attains
7. Find out and remove obstacles as much as possible
In more concrete way

Texts
1. Available handouts
2. Emphasise important pieces especially: size, color
3. Devide long text into smaller pieces
4. Use fonts Calibri, Arial, Comic Sans, Verdana
   proper size, colors, background color, dark text in bright field
5. Use plain language (if needed)
In more concrete way

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Homework:
1. What is already done in my library?
2. What we should start or go on in my library?
Dyslectic librarians – is it possible?!

- Statistics 5-15% of population
- Identified or not
- Personal experiences in life, in professional carrier
- Let`s them talk!
Main authors:
Frith, U., Ramus, F.
Ahonen, T., Bacon, A., Bennett, J., Boets, B., Deponio, P., Fawsett, A.,
Gyarmathy, E., Lyytinen, H., Nicolson, R., Pennington, B., Powell,
Price, T., Reid, G., Shapiro, H., Snowling, M., Stanovich, K., Torgesein,
J. K., Wolf, M.

Galaburda, A., Lundberg, I., Miles, T.
The aims of the current presentation:
- Introduce dyslexia framework which provides broad and different theories integrated approach
- Present that originally biological problem has lot of different solutions
- Look at the possible solutions in the environment, in library situation
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If we know more, we can do more and on the better way.

Let`s do that!
Thank you!
Comments?
Questions?
ESTONIAN REDING ASSOCIATION  
EESTI LUGEMISÜHING  
www.lugemisyhing.ee

• Founded in May 1992
• More than 200 members
• Members: university professors, students, school principals, teachers, in-service trainers, kindergarten teachers, special educators, speech therapists, editors, librarians, etc.
• Associated member of the International Reading Association (IRA) from April 1993
• Member of the International Development in Europe Committee (IDEC) of IRA, leader Meeli Pandis
• 13th European Reading Conference in Tallinn in 2003

Handouts and poster are available in foyer. Please!
Thank you!
Role of teaching, language and socio-cultural environment

What dyslexia is not?
Holistic approach

Environmental aspects:
- socio-econ-cult
- language
- international and cross-linguistic approach
- familiar risk
- early identification
- and intervention
- teaching and supporting effectiveness
- coincidence with other developmental conditions
- nutrition
- etc .........

Visual and auditory magnocellular system supporting reading process

Visual magnocellular theory
- magnocells - 10% of eye retina cells: fast reactions to visual stimuli, visual stimuli sequence and timing, eye movement control, visual representations detection
- parvocells – 80%, colors, details, slow reactions

Magnocells differences in dyslexia:
- structure, size – 27% smaller
- → reduced difference between magno and parvocells
- → low sensitivity in visual contrast

Results:
- discrete, unregular, non-synchronised eye movements in visual perception
LUGEMISRASKUS/DÜSLEKSIA:

- LUGEMINE: - tehnika, - mõistmine, -aeg
- LUGEMISRASKUS: nn: tort
  - lugemistehnilised raskused,
  - loetu mõistmise raskused,
  - raskused kognitiivsetes protsessides
- Kõne- ja keelekasutuse iseärasustel põhinev lugemise- ja/või õppimise raskus
- Püsivamaid tunnuseid on ebapüsivus
- Vigade arvu järsk suurenemine stressi korral
- Varase ea iseärasused → L raskus → õpiraskus → akadeemiline jõudlus → toimetulek elus

http://www.youtube.com/watch?v=mHGo-64dXJc I am Dyslexia

- Terminite kasutamine LUGEMISRASKUS – DÜSLEKSIA
- 3-astmeline mudel: bioloogiline, kognitiivne, sooritus, lisaks soovitused