



Profile of Visual Functioning

as a bridge
between education and medicine
in the assessment of impaired vision

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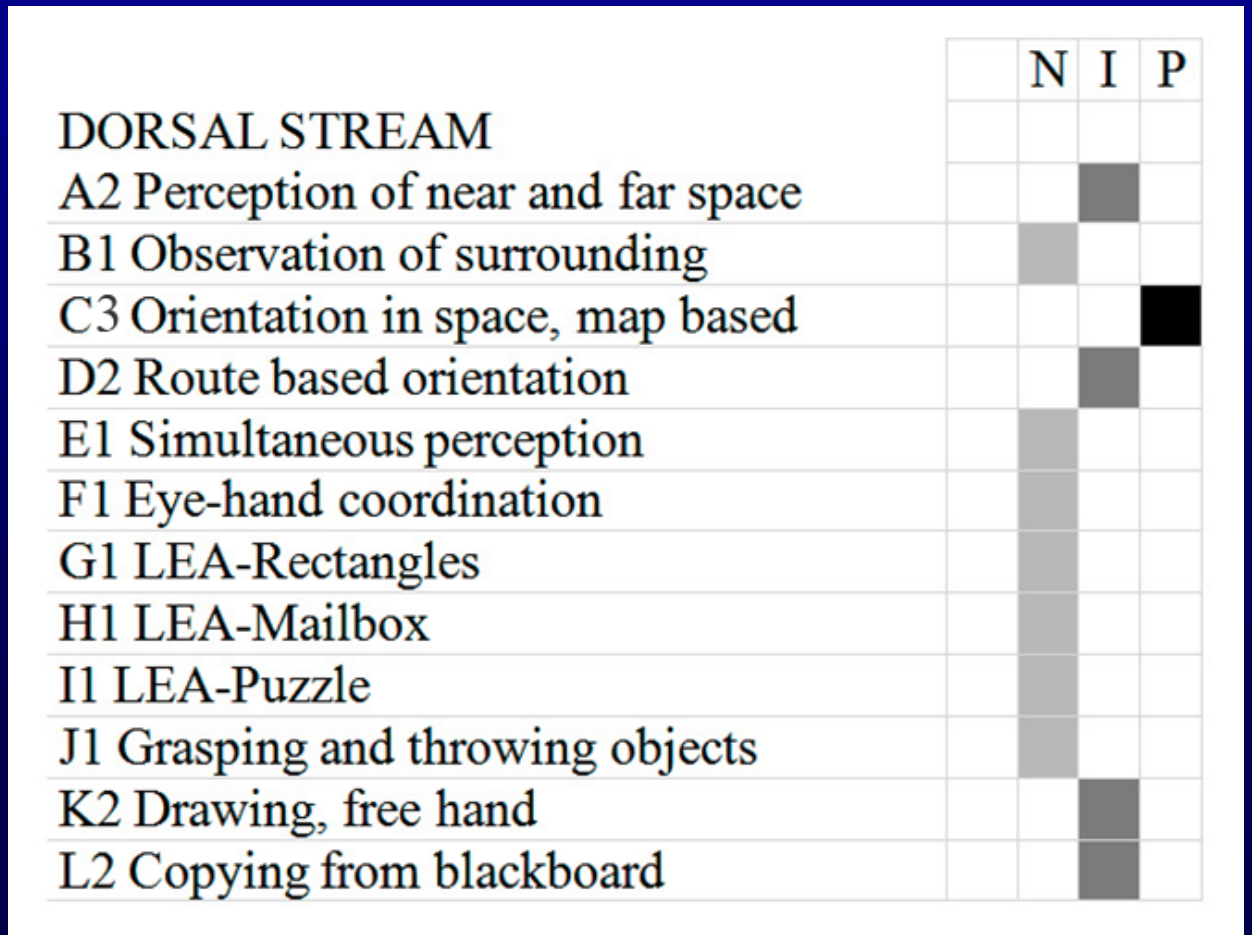
Profile of visual functioning

For the IEP/ILP 2004, the learning strategies that probably will be used

N= normal (1), I= impaired but useful (2), P=profound VI or blindness (3)



Assessment of Visual Functioning

1. OCULAR MOTOR FUNCTIONS and REFRACTION

2. QUALITY OF VISUAL INFORMATION

CLINICAL TESTS

A. Information from the ophthalmologist, optometrist, neurologist

B. Observation and measurements at EI, KG, and schools

C. General and visual ergonomics

3. ASSESSMENT OF VISUAL PROCESSING

CASE		N	I	P
OCULAR MOTOR FUNCTIONS				
A Fixation				
B Following movements				
C Saccades				
D Nystagmus				
E Strabismus				
F Accommodation				
G Convergence				
CLINICAL FINDINGS, sensory				
H Binocularity				
I Visual Acuity				
J Grating Acuity				
K Contrast sensitivity, optotype, grating				
L Colour Vision				
M Adaptation speed, observation				
N Photophobia				
O Visual field, central scotoma?				
P Visual field, peripheral				
Q Motion perception, Pepi-test				
R Biological motion, Walking Man				
S Refraction				
T Correction of refractive errors				
EARLY PROCESSING				
V Length of lines				
W Orientation of lines				
X Objects/figures on a patterned background				
Y Textures and surface qualities				
DORSAL STREAM				
A Perception of near and far space				
B Observation of surrounding				
C Orientation in space, map based				
D Route based orientation				
E Simultaneous perception				
F Eye-hand coordination				
G Length of lines				
H Direction of lines				
I LEA-Puzzle				
J Grasping and throwing objects				
K Drawing, free hand				
L Copying from blackboard				
M Spatial problems in mathematics				
N Spatial problems in reading				
OTHER PROFILES AVAILABLE				
A Developmental level				
B Motor Functions				

		N	I	P
VENTRAL STREAM				
A Lenght of lines, purely visual test				
B Direction of lines, purely visual test				
C Recognition of details				
D Noticing missing details in pictures				
E Recognition of faces				
F Interpretation of facial expressions				
G Reading body language				
H Landmarks				
I Concrete objects				
J Pictures of concrete objects				
K Abstract pictures of objects of different categ				
L Abstract forms (Roman letters, numbers)				
M Reading words, characters				
N Cartoons				
O Visual problems in copying pictures				
P Increased crowding effect				
Q Recognition problems n math tasks				
MIRROR NEURON SYSTEM				
A Early communication and interaction				
B Interpretation of emotions and intentions				
C Observation and copying of movements				
D Effect of image quality, motion perception				
E Effect of image quality, contrast sensitivity				
F				
G				
OTHER COMMON PROBLEMS				
M Integration of sensory information				
N Visual and auditory overload				
O Specific memory problems				
P Head control				
Q Body control				
R Hand functions				
S Moving				
T Hearing				
U Executive functions				
V Other				
W Use of devices at school, KG, work				
X Use of devices at home				
Y Services of educational resource centre				
Z Vision services as medical care				
MAIN FUNCTIONAL AREAS				
A Communication				
B Orientation and moving				
C Activities of daily living				
D Demanding vision tasks				

PROFOUND loss of function in __visual funcitions
IMPAIRED but useful visual functions in __
NORMAL visual function in __ functions

CASE		N	I	P
OCULAR MOTOR FUNCTIONS				
A Fixation				
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EARLY PROCESSING				
V Length of lines				
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DORSAL STREAM				
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OTHER PROFILES AVAILABLE				
A Developmental level				
B Motor Functions				

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PROFOUND loss of function in __visual funcitions
IMPAIRED but useful visual functions in __
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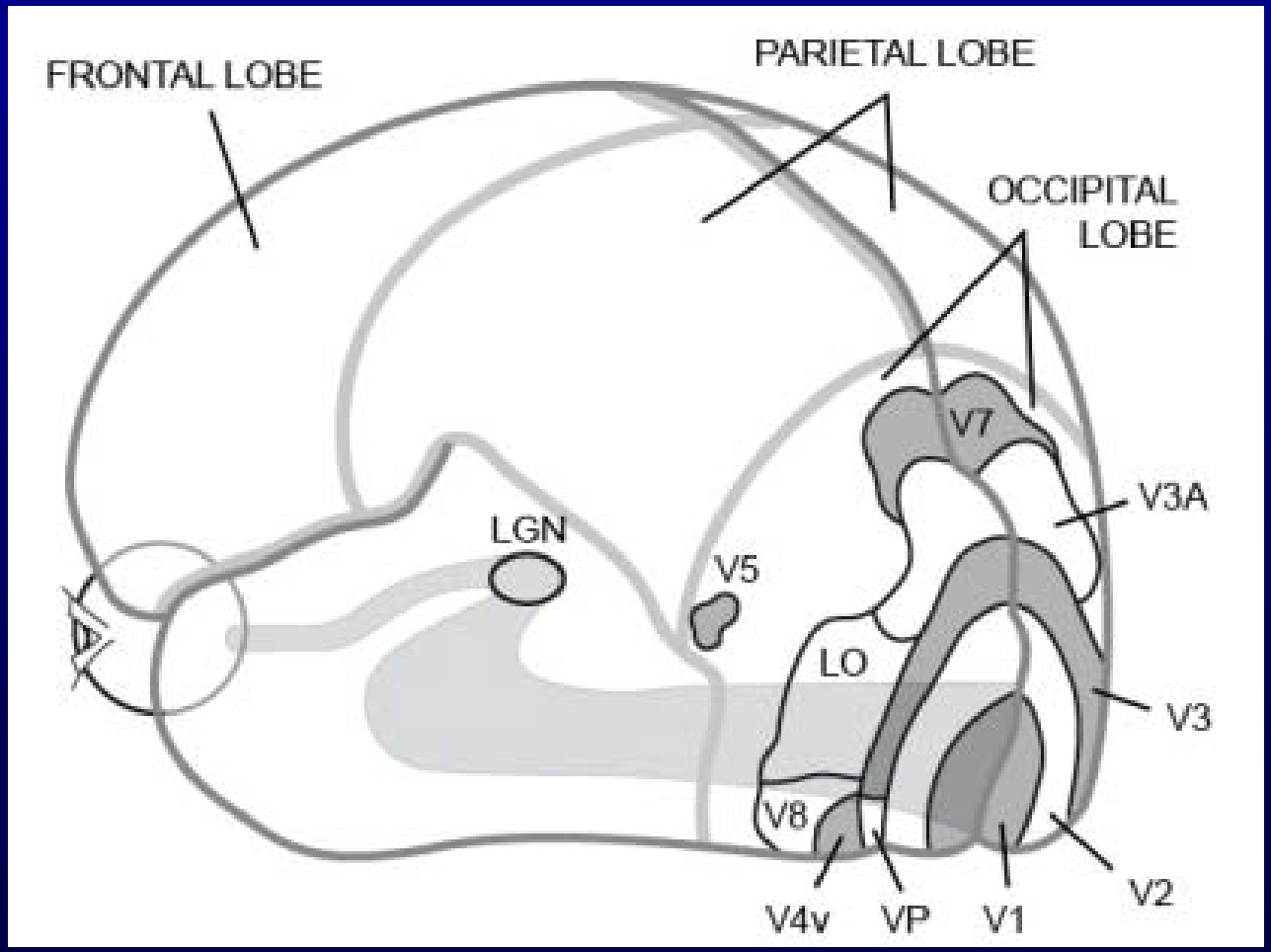
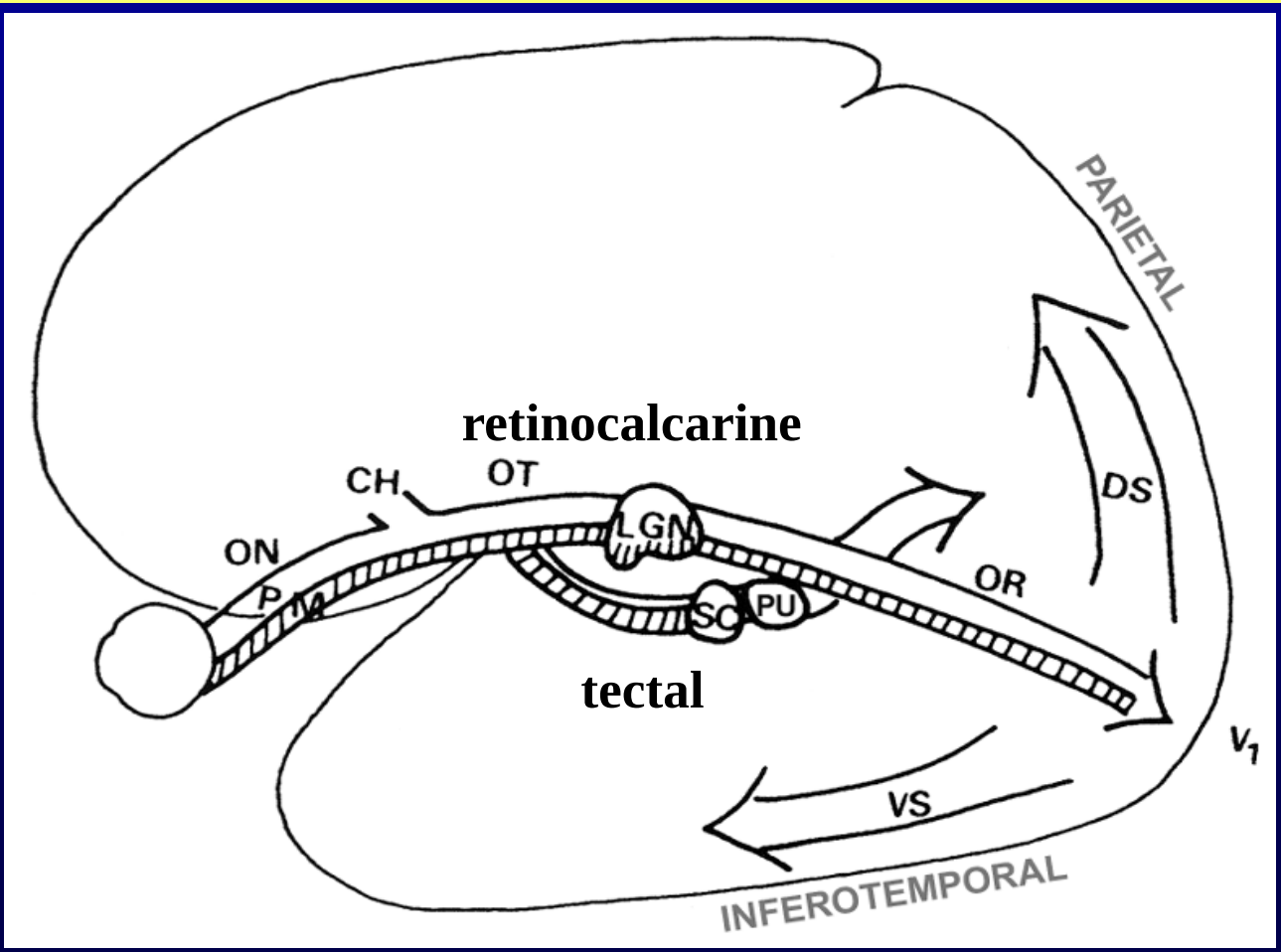
Retinocalcarine pathway

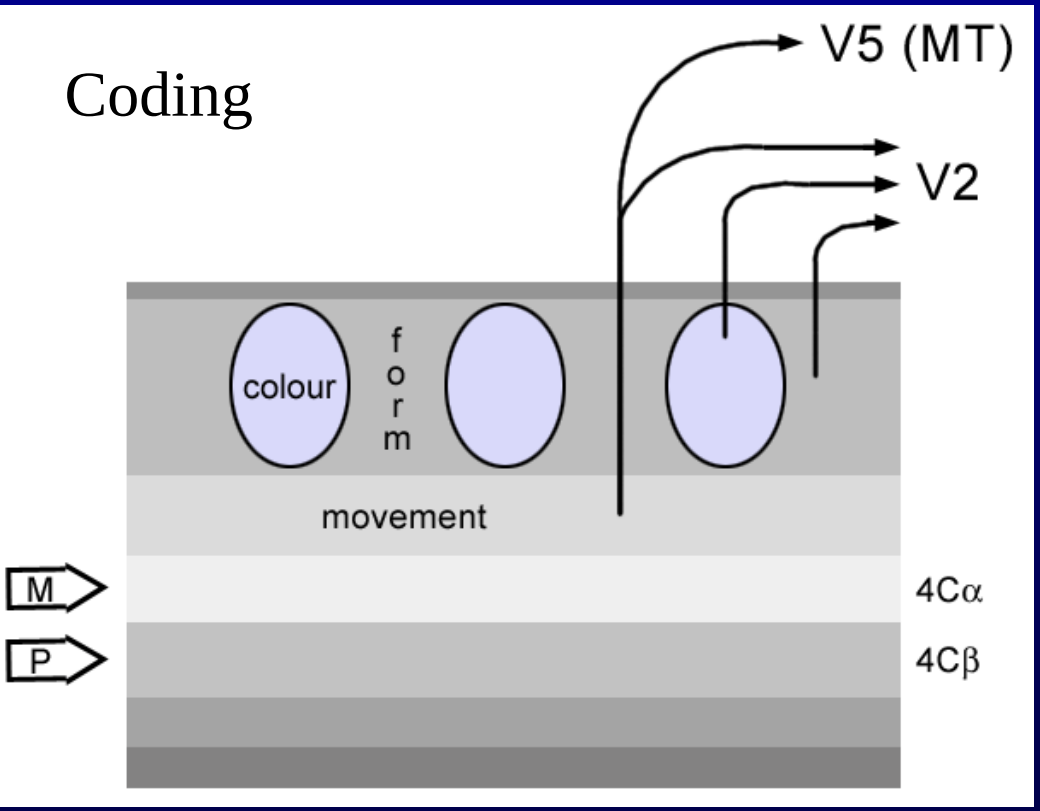


Retinocalcarine and tectal pathway



LGN= Lateral Geniculate Nucleus; SC= Superior Colliculus; PU= Pulvinar

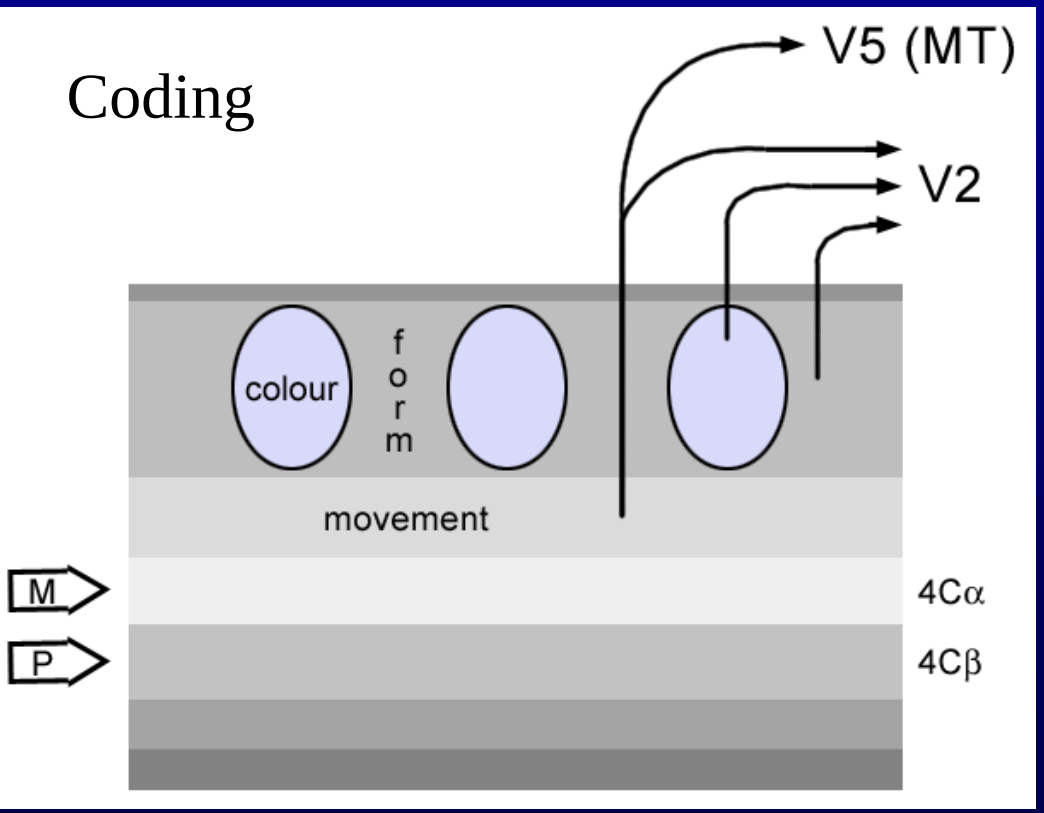
Primary visual cortex



Fusion of information

Coding for:
- colours
- forms: length and direction of lines
- movement, motion
- stereovision
- textures, surface qualities
- object/background, figure/ground
- visual illusions

Primary visual cortex



Fusion of information

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- stereovision
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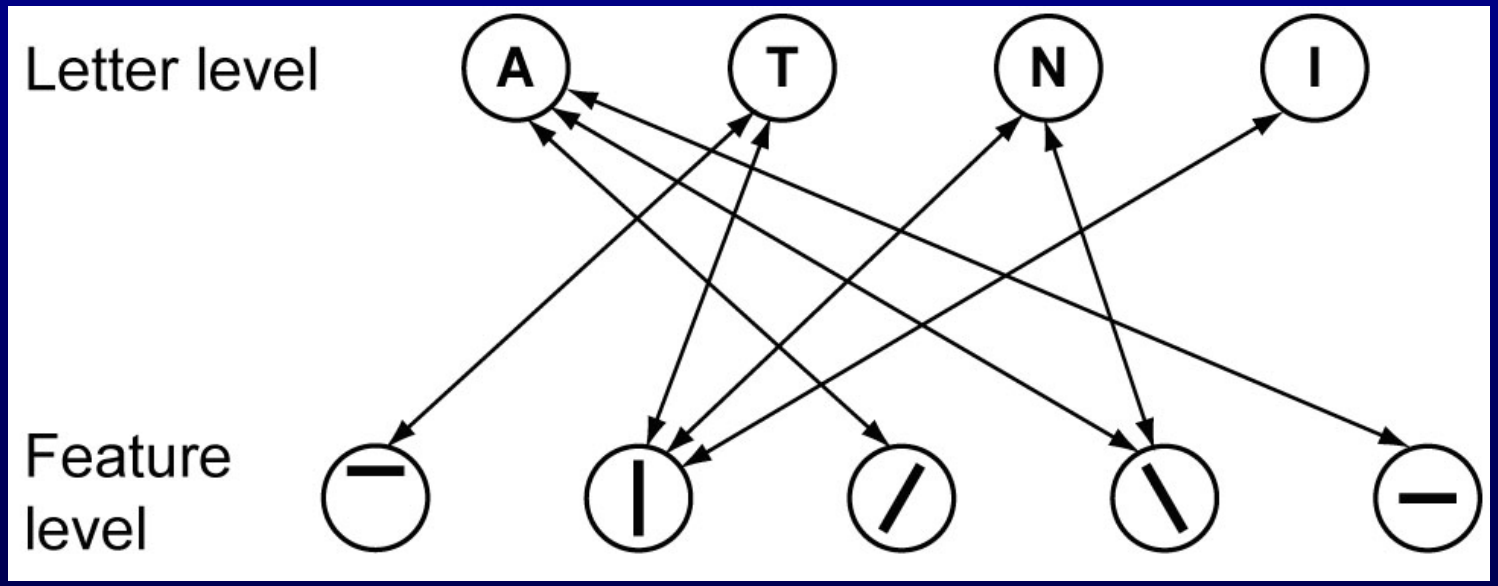
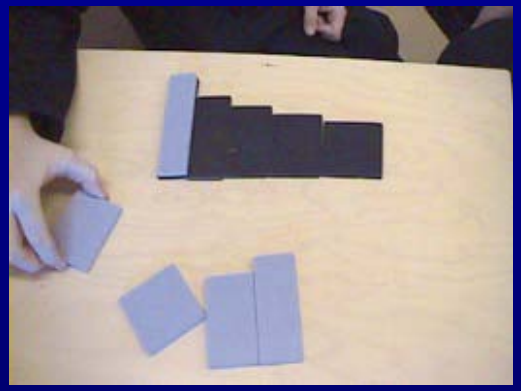
- object/background, figure/ground
- visual illusions

Visual working memory

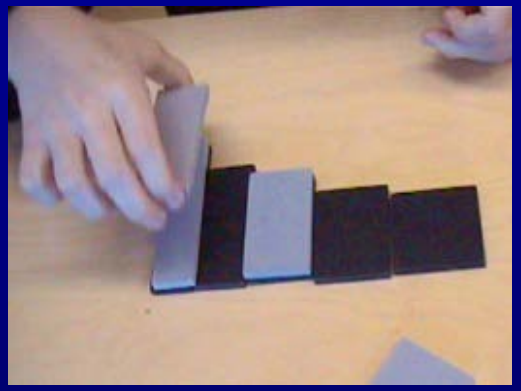
From details to letters



Early visual processing

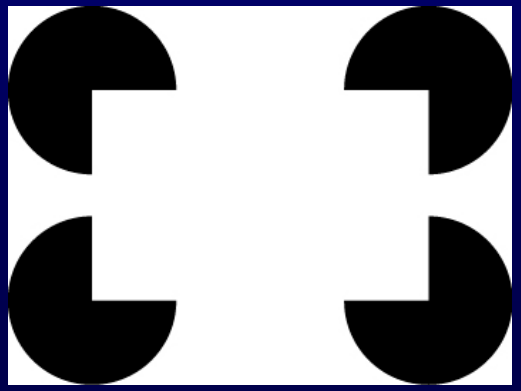


- Length, eye-hand coordination, parietal



Length, visual comparison, inf. temporal

- Orientations/directions of lines, parietal



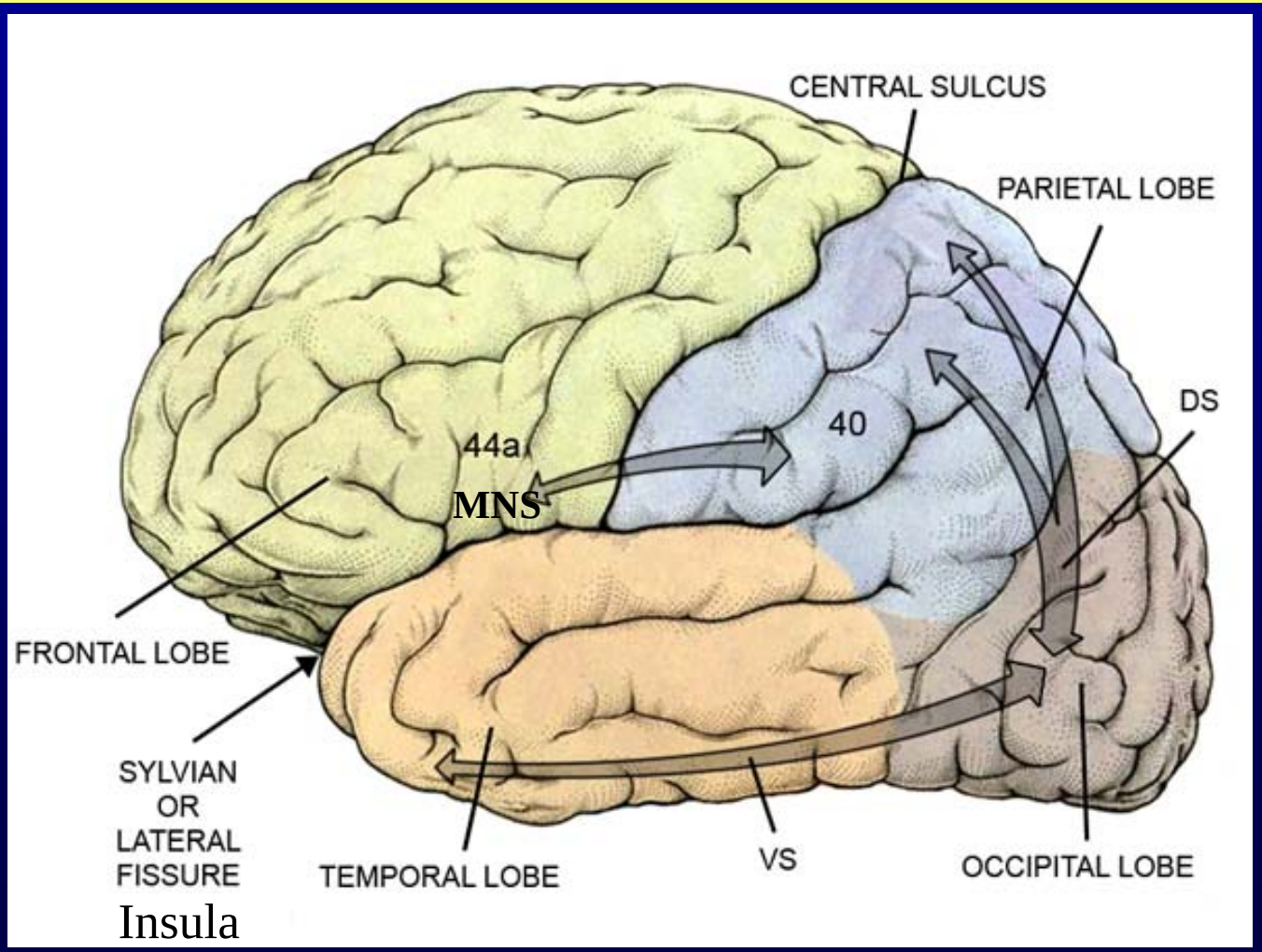
Visual illusion, rectangle

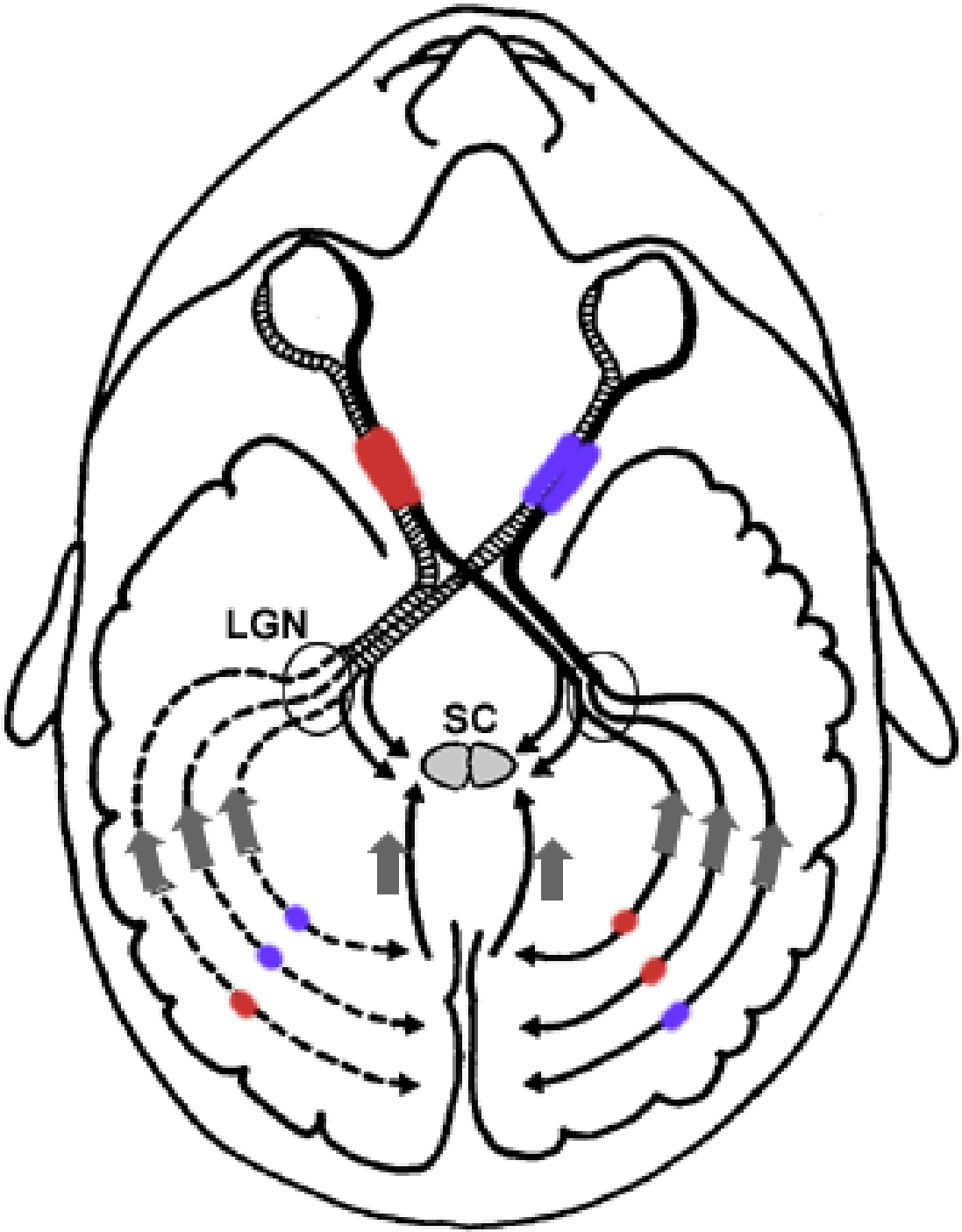
Rectangles – Mailbox
Colorama - Heidi Expressions

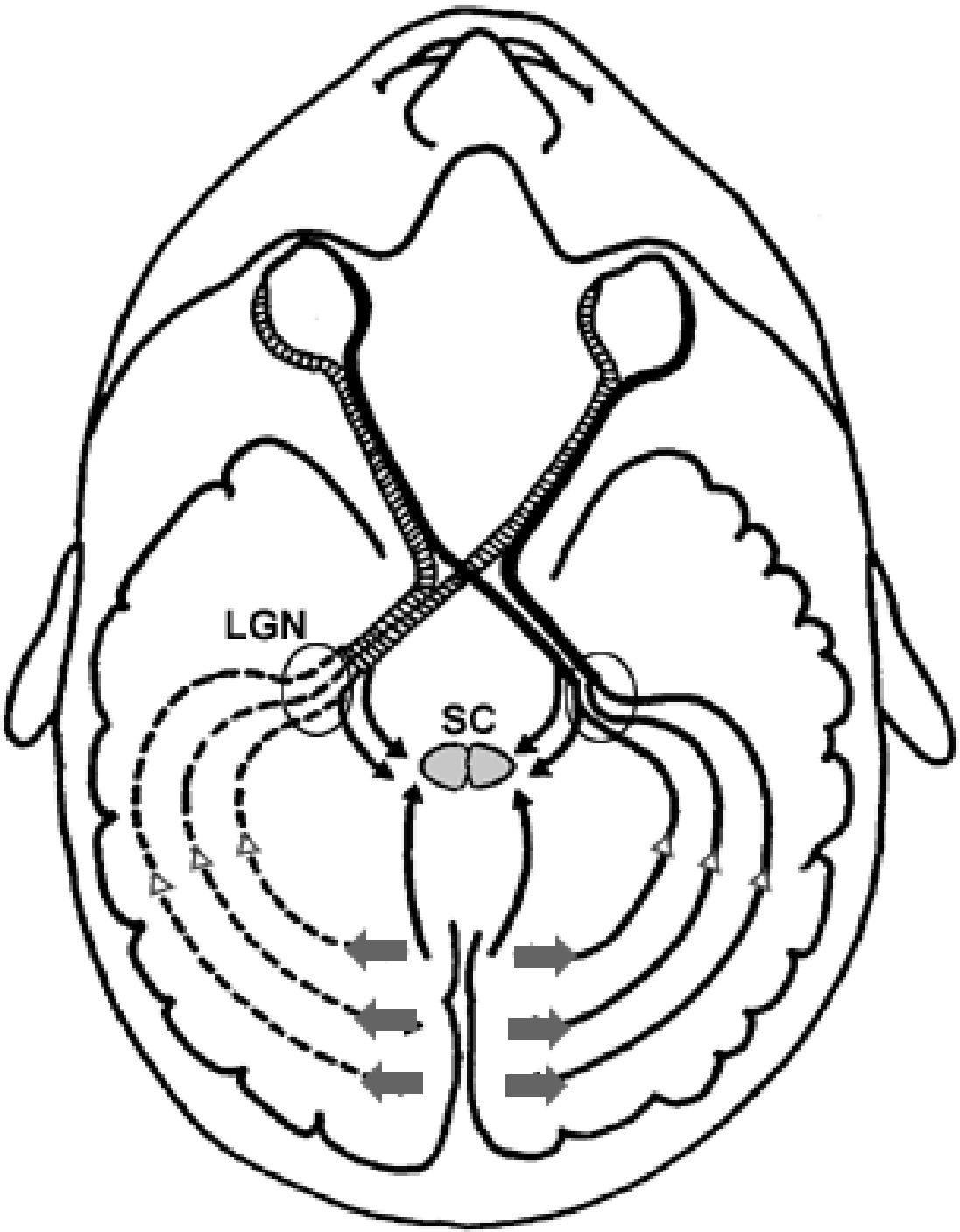
26.2.2000; 3years 8 (corr. 5) months

Face blindness

Ventral and dorsal stream/network
Mirror neuron system




LGN
SC


LGN
SC

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NORMAL visual function in __ functions

Teaching of strategies

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B Following movements				
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D Nystagmus				
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F Accommodation				
G Convergence				
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EARLY PROCESSING				
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E Effect of image quality, contrast sensitivity				
F				
G				

Assessment of Visual Functioning

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2. QUALITY OF VISUAL INFORMATION

CLINICAL TESTS

A. Information from the ophthalmologist, optometrist, neurologist

B. Observation and measurements at EI, KG. and schools

C. General and visual ergonomics

3. ASSESSMENT OF VISUAL PROCESSING

CASE RT		N	I	P
OCULAR MOTOR FUNCTIONS				
A Fixation		N		
B Following movements		N		
C Saccades			I	
D Nystagmus		N		
E Strabismus		N		
F Accommodation		N		
CLINICAL FINDINGS, sensory				
G Binocularity		N		
H Visual Acuity		N		
I Grating Acuity				
J Contrast sensitivity, optotype		N		
K Contrast sensitivity, grating				
L Colour Vision		N		
M Adaptation speed				
N Photophobia		N		
O Visual field, central		?		?
P Visual field, peripheral		?		?
Q Motion perception, Pepi-test		N		
R Biological motion, Walking Man		N		
S Depth perception				
T Vernier acuity				
U				
EARLY PROCESSING				
V Length of lines		N		
W Orientation of lines			I	
X Objects/figures on a patterned background			I	
Y Visual closure				
Z Textures and surface qualities				
AA Short time memory				
DORSAL STREAM				
A Perception of near and far space				
B Observation of surrounding				
C Orientation in space, map based				
D Route based orientation			I	
E Simultaneous perception			I	
F Eye-hand coordination		N		
G Length of lines		N		
H Direction of lines				
I LEA-Puzzle		N		
J Grasping and throwing objects				
K Drawing, free hand			I	
L Copying from blackboard				P

		N	I	P
VENTRAL STREAM				
A Lenght of lines, purely visual test				
B Direction of lines, purely visual test				
C Recognition of details				
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E Recognition of faces			I	
F Interpretation of facial expressions			I	
G Reading body language			I	
H Landmarks				
I Concrete objects				
J Pictures of concrete objects				
K Abstract pictures of objects of different categ				
L Abstract forms (Roman letters, numbers)				
M Comparison with pictures in memory				
N Cartoons				
O Visual problems in copying pictures			I	
P Increased crowding effect		N		
Q Recognition in mathematical tasks		N		
S Spatial problems in math				
MIRROR NEURON SYSTEM				
A Early communication and interaction			I	
B Interpretation of emotions and intentions			I	
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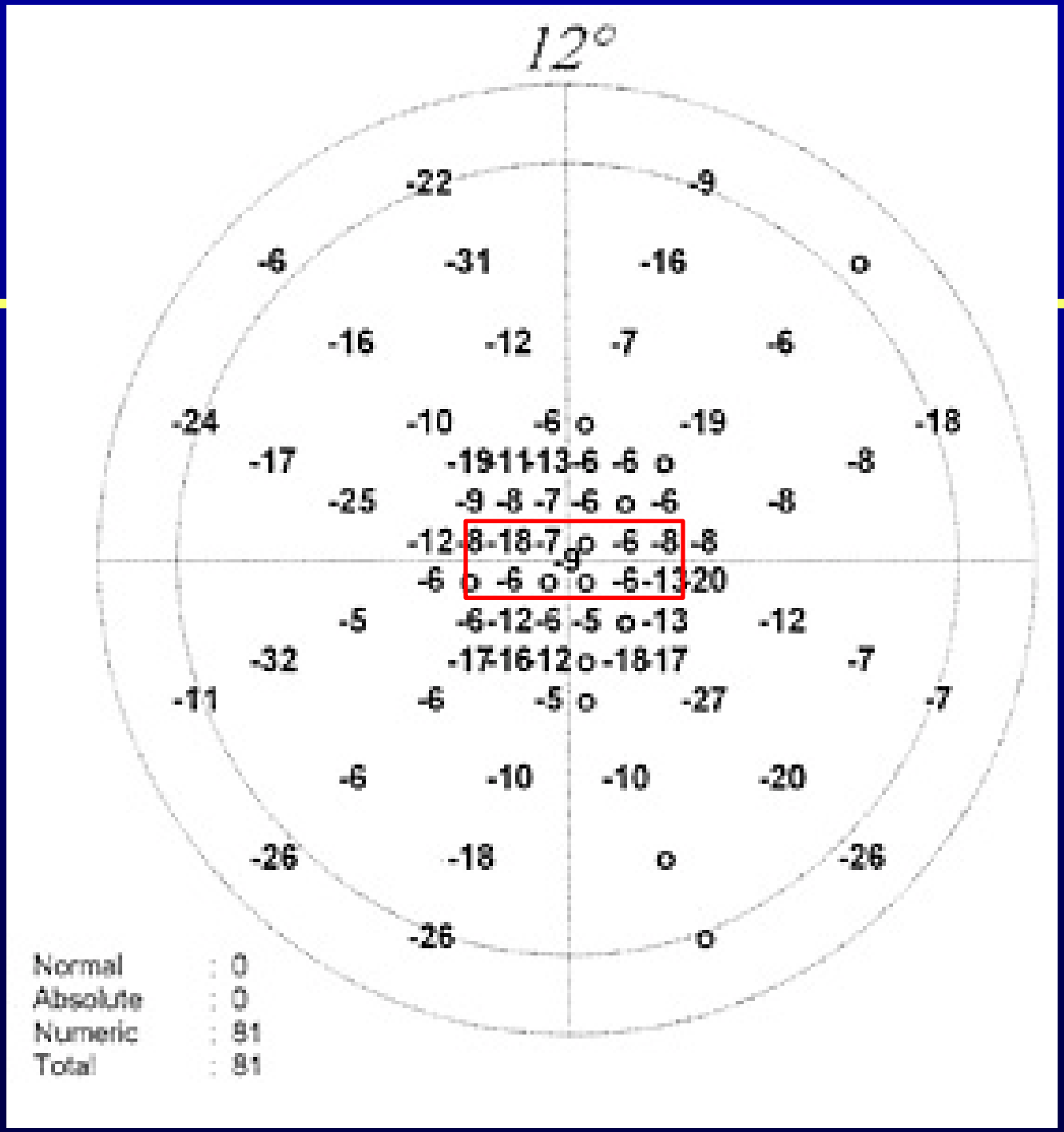
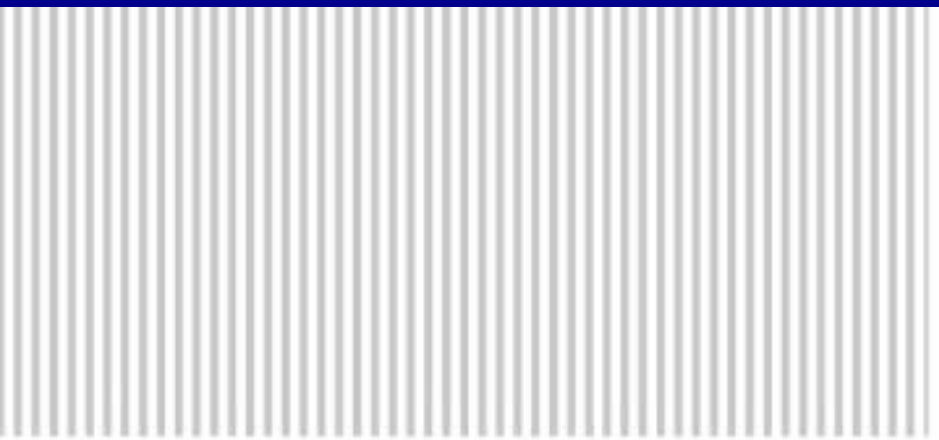
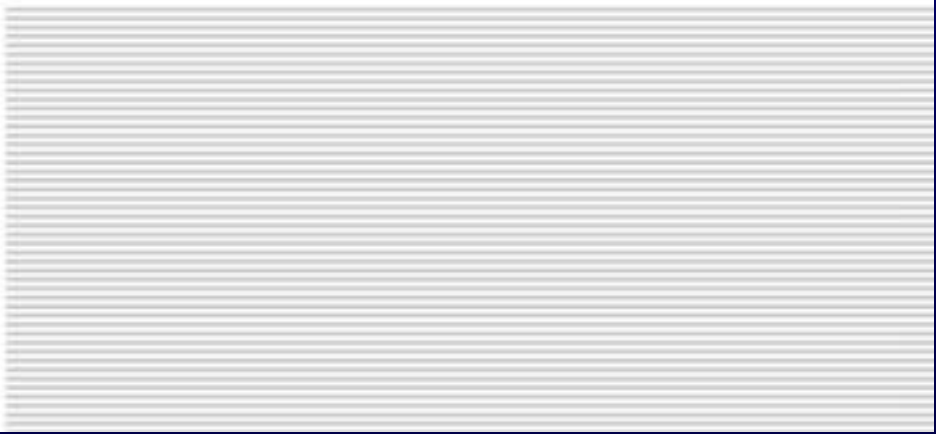
D Effect of image quaity, motion perception				
E Effect f iage quality, contrast sensitivity				
F				
G				
OTHER COMMON PROBLEMS				
M Integration of sensory information				
N Visual and auditory overload			I	
O Specific memory problems				
P Head control		N		
Q Body control		N		
R Hand functions		N		
S Moving		N		
T Hearing			I	
U Executive functions				
V Other				
W Use of devices, categories decided locally				


12°
-22 -9
-6 -31 -16 o
-16 -12 -7 -6
-24 -10 -6 o -19 -18
-17 -19 -11 -13 -6 -6 o -8
-25 -9 -8 -7 -6 o -6 -8
-12 -8 -18 -7 o -6 -8 -8
-6 o -6 o o -6 -13 -20
-5 -6 -12 -6 -5 o -13 -12
-32 -17 -16 -12 o -18 -17 -7
-11 -6 -5 o -27 -7
-6 -10 -10 -20
-26 -18 o -26
-26 o
Normal : 0
Absolute : 0
Numeric : 81
Total : 81

Low contrast gratings





Unusual ”dyslexia”

Letters A and V shown on an oscilloscope:

Space (deg)	.5	1.0	1.5	2.0	2.5
Stimulus	A V	A V	A V	A V	A V
Appearance					

Time (msec)	7.5	15	25	50	100
Stimulus	A V	A V	A V	A V	A V
Appearance					

Visual acuity with line test 0.5 (3/6, 10/20), but 1.6 when pointed at.

Nyman G, Laurinen L, Hyvärinen L. Topographic instability of spatial vision as a cause of dyslectic disorder: a case study (1982) Neuropsychologica 20:181-186.

10.2 TC		N	I	P
CLINICAL FINDINGS, ocular motor funct				
A1 Fixation				
B1 Following movements				
C1 Saccades				
D1 Nystagmus				
E3 Strabismus	3			
F2 Accommodation				
CLINICAL FINDINGS, sensory				
G2 Binocularity				
H1 Visual Acuity				
I1 Grating Acuity				
J1 Contrast sensitivity, optotype				
K Contrast sensitivity, grating				
L1 Colour Vision				
M4 Adaptation speed	4			
N2 Photophobia				
O1 Visual field, central				
P1 Visual field, peripheral				
Q2 Motion perception, high speed				
R1 Biological motion				
S Depth perception				
T5 Vernier acuity				
U5 Other				
EARLY PROCESSING				
V1 Length of lines,				
W1 Orientation of lines,				
X2 Objects/figures on patterned background				
Y Visual closure				
Z2 Textures and surface qualities				
AA1 Short time memory, if text is large				
DORSAL STREAM				
A2 Perception of near and far space				
B1 Observation of surrounding				
C2 Orientation in space, map based				
D2 Route based orientation				
E1 Simultaneous perception				
F1 Eye-hand coordination				
G1 LEA-Rectangles				
H1 LEA-Mailbox				
I1 LEA-Puzzle				
J1 Grasping and throwing objects				
K2 Drawing, free hand				
L2 Copying from blackboard				

		N	I	P
VENTRAL STREAM				
A1 LEA-Rectangles, purely visual part of the test				
B1 LEA-Mailbox, purely visual part of the test				
C1 Recognition of details				
D1 Noticing errors and missing details in pictures				
E3 Recognition of faces				
F2 Interpretation of facial expressions				
G2 Reading body language				
H2 Landmarks				
I1 Concrete objects				
J1 Pictures of concrete objects				
K1 Abstract pictures, objects of diff. categories				
L1 Abstract forms (Roman letters, numbers)				
M1 Sequencing non-sense words				
N1 Comparison with pictures in memory				
O1 Funny pictures				
P1 Pictures of different activities, occupations				
R1 Reading series of pictures				
S1 Visual problems in copying pictures				
T2 Increased crowding effect				
U1 Recognition in mathematical tasks,				
V1 Memory functions				
W2 Spatial problems				
X5 Other				
OTHER COMMON PROBLEMS				
M1 Integration of sensory information				
N2 Visual and auditory overload				
O1 Specific memory problems				
P1 Head control				
Q1 Body control				
R2 Hand functions				
S2 Moving				
T1 Hearing				
U2 Executive functions				
V5 Other				
W1 Use of devices, categories decided locally				

OCULAR MOTOR				N,1	I,2	P,3	
A1	Fixation			1			
B2	Saccades						
C2	Scanning						
D2	S+S in reading						
E3	Accommodation						
F	Following						
G	Strabismus			1			
H	Nystagmus						
I	Head control						
J	Body control						
K							
L							
M	Refraction			1			
N	Spectacles, add						
O	Devices						
P							
Q							

SENSORY FUNCTIONS							
A	VA near, line						
B	VA dist, line						
C	VA crowd						
D	Single only		4				
E	Grating A, discrimin.						
F	Grating A, detect.		4				
G	CS, optotypes						
H	CS, grating						
I	Colour vision			1			
J	Vad		5				
K	Filters		5				
L	Figure in motion			1			
M	Biological motion			1			
N	High speed motion						
O	Very low speed		5				
P	Visual field, size			1			
Q	VF, central						
R	Vernier acuity		5				
S							

EARLY PROCESSING							
A	Length, eye-hand			1			
B	Length visually			1			
C	Direction eye-hand			1			
D	Direction visually						
E	Figure - ground						
F	Object - background			1			
G	Stereovision						
H	Matching colours			1			
I	Short time memory			1			

INF.TEMP NETWORKS...							
A	Details in pictures			1			
B	Noticing errors						
C	Missing details		5				
D	Textures, surfaces		5				
E	Face recognition			1			
F	Facial expressions			1			

...INF.TEMP NETWORKS				N,1	I,2	P,3	
G	Body language			1			
H	Landmarks			1			
I	Concrete objects			1			
J	Pictures, conc.obj			1			
K	Abstact pictures						
L	Characters			1			
M	Numbers			1			
N	Reading words			1			
O	Optimal read strategy						
P	Comparing pictures						
Q	Copying pict.blackbo.						
R	Copying pict.desk			1			
S	Crowding effect						
T	Scanning text						
U	Visual imagination						

PARIETAL NETWORKS							
A	Spatial awareness			1			
B	Directions in space			1			
C	Distances in space			1			
D	Body awareness			1			
E	Near space			1			
F	Far space			1			
G	Orientation map b.			1			
H	Memorising routes			1			
I	Motion percept.		5				
J	Depth perception		5				
K	Simultaneous		5				
L	Eye-hand coordinat.			1			
M	Goal directed reach.			1			
N	Goal dir. grasping			1			
O	Drawing free hand		5				
P	Copying as motor			1			
Q	Math tasks		5				

COMMON PROBLEMS							
A	Sensory integration			1			
B	Visual overload			1			
C	Auditory overload			1			
D	Sped. memory prob			1			
E	Hearing			1			
F	Mobility						
G	Hand functions			1			
H	Executive functions		5				
I	Visual ergonomics						
J	Devices in classroom						
K	Devices at home						
L	Vision in participat		5				
M	Attitudes of other		5				
N							
O							
P							

SUMMARY							
	Communication						
	Moving						
	Activities of daily life						
	Sustained tasks						

CASE	C	N	I	P
OCULAR MOTOR FUNCTIONS				
A Fixation				
B Following movements				
C Saccades				
D Nystagmus				
E Strabismus				
F Accommodation				
G Convergence				
CLINICAL FINDINGS, sensory				
H Binocularity				
I Visual Acuity				
J Grating Acuity				
K Contrast sensitivity, optotype, grating				
L Colour Vision				
M Adaptation speed, observation				
N Photophobia				
O Visual field, central scotoma?				
P Visual field, peripheral				
Q Motion perception, Pepi-test				
R Biological motion, Walking Man				
S Refraction				
T Correction of refractive errors				

Visual ergonomics

EARLY PROCESSING				
V Length of lines				
W Orientation of lines				
X Objects/figures on a patterned background				
Y Textures and surface qualities				

DORSAL STREAM				
A Perception of near and far space				
B Observation of surrounding				
C Orientation in space, map based				
D Route based orientation				
E Simultaneous perception				
F Eye-hand coordination				
G Length of lines				
H Direction of lines				
I LEA-Puzzle				
J Grasping and throwing objects				
K Drawing, free hand				
L Copying from blackboard				
M Spatial problems in mathematics				
N Spatial problems in reading				

OTHER PROFILES AVAILABLE				
A Developmental level				
B Motor Functions				

VENTRAL STREAM	C	N	I	P
A Lenght of lines, purely visual test				
B Direction of lines, purely visual test				
C Recognition of details				
D Noticing missing details in pictures				
E Recognition of faces				
F Interpretation of facial expressions				
G Reading body language				
H Landmarks				
I Concrete objects				
J Pictures of concrete objects				
K Abstract pictures of objects of different categ				
L Abstract forms (Roman letters, numbers)				
M Reading words, characters				
N Cartoons				
O Visual problems in copying pictures				
P Increased crowding effect				
Q Recognition problems n math tasks				

MIRROR NEURON SYSTEM				
A Early communication and interaction				
B Interpretation of emotions and intentions				
C Observation and copying of movements				
D Effect of image quality, motion perception				
E Effect of image quality, contrast sensitivity				
F				
G				

OTHER COMMON PROBLEMS				
M Integration of sensory information				
N Visual and auditory overload				
O Specific memory problems				
P Head control				
Q Body control				
R Hand functions				
S Moving				
T Hearing				
U Executive functions				
V Other				
W Use of devices at school, KG, work				
X Use of devices at home				
Y Services of educational resource centre				
Z Vision services as medical care				

MAIN FUNCTIONAL AREAS				
A Communication				
B Orientation and moving				
C Activities of daily living				
D Demanding vision tasks				

PROFOUND loss of function in __visual funcitions
IMPAIRED but useful visual functions in __
NORMAL visual function in __ functions



Profile of Visual Functioning

as a bridge
between education and medicine
in the assessment of impaired vision

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