

# CVI and reading problems

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# main theoretical clusters

- Language related; phonological awareness and recoding (orthographic-phonological conversion rules)
- Temporal processing; rapid stimulus sequences
- Visual and magnocellular processing

Alan A. Beaton (2004). *Dyslexia, reading and the brain*. A sourcebook of psychological and biological research New York, Psychology Press

Sireteanu, R., Goebel, C., Goertz, R., Werner, I., Nalewajko, M., Thiel, A. (2008). *Impaired serial visual search in children with developmental dyslexia*. Ann. N. Y. Academic Science 1145: 199-211.

Lassus-Sangosse, D., N'guyen-Morel, M., Valdois, S. (2008). *Sequential or simultaneous visual processing deficit in developmental dyslexie?*. Vision Research 48, 979-988.

# Effects of acuity loss upon reading

- N= 400 visually impaired children
- Integrated ≠ in special education
- Slower in decoding, same in amount of mistakes.  
Need more time: 1 ½ -2x
- Acuity + fielddefects >
- As good as in reading comprehension, spelling
- Compensation strategies: meaningful context and frequent orthographic neighbours

Gompel, M. (2005). *Literary skills of children with low vision.*  
Nijmegen: UB Nijmegen.

[http://webcod.ubn.ru.nl/mono/g/gompel\\_m/liteskofc](http://webcod.ubn.ru.nl/mono/g/gompel_m/liteskofc).  
CVRS Cardiff June 2009

♂ 11yr Premature birth (32 wks)  
ROP+ Hydrocephalus

Nystagmus

Acuity OS 0.08

Right visual field -

Colour +

Contrast -

Prosopagnosia

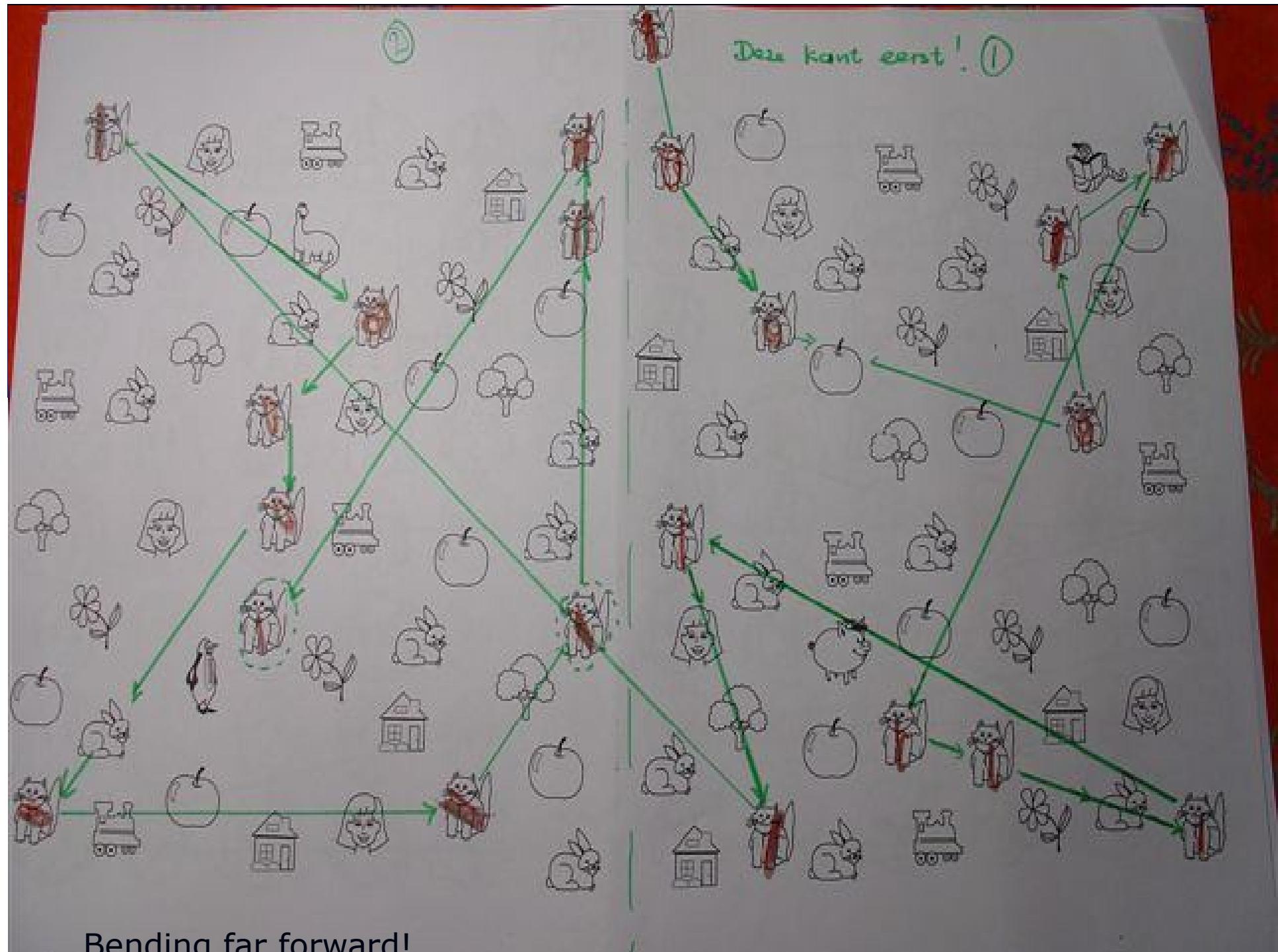
Form constancy -

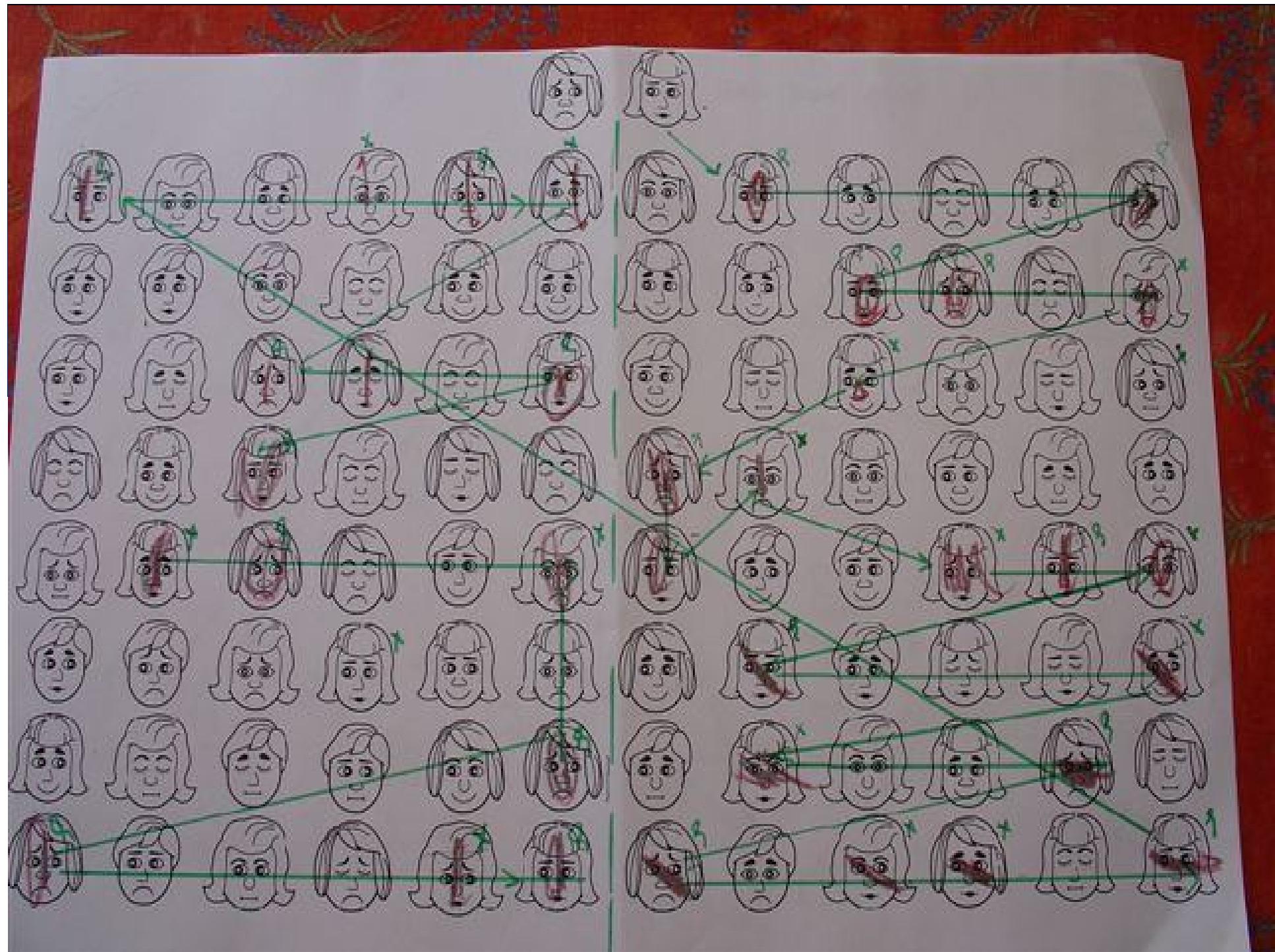
Spatial orientation +

Regular education

Works at group level

Reads very well (with TV magnifying system)





♀ **11yr little brain tissue ci.**

Acuity 0,1 in '00

Slow motor start

Sensory information  
processing problems

No eye contact; looks up  
a lot and still does so.

Ventral+

Visual Complexity –

Figure background-

Vis sequential –

Spatial orientation +

Now

Acuity 0,6 ang=lin

Field:probably  
somewhat small

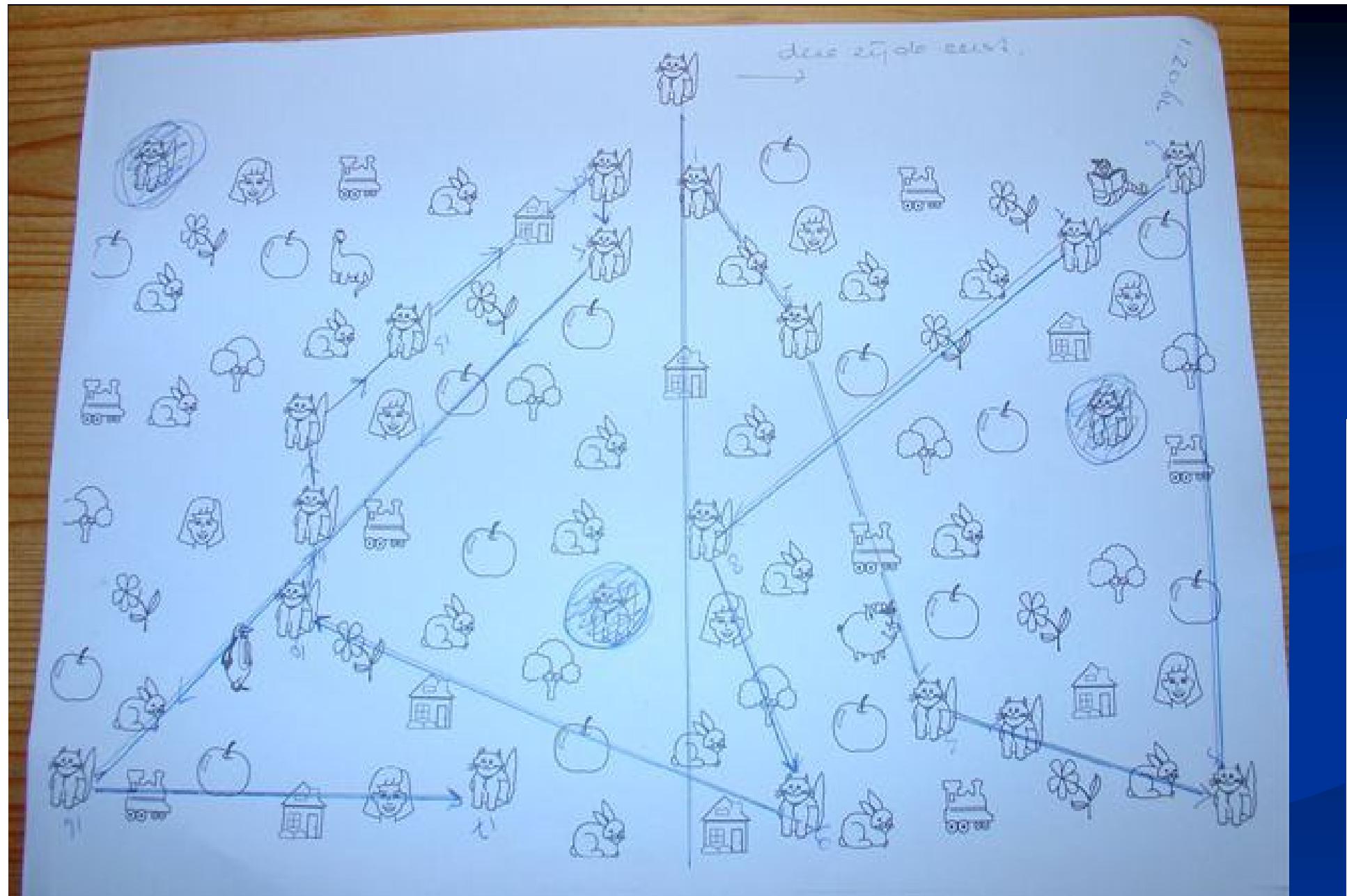
Low normal IQ

VerbalWM ±, Viswm –

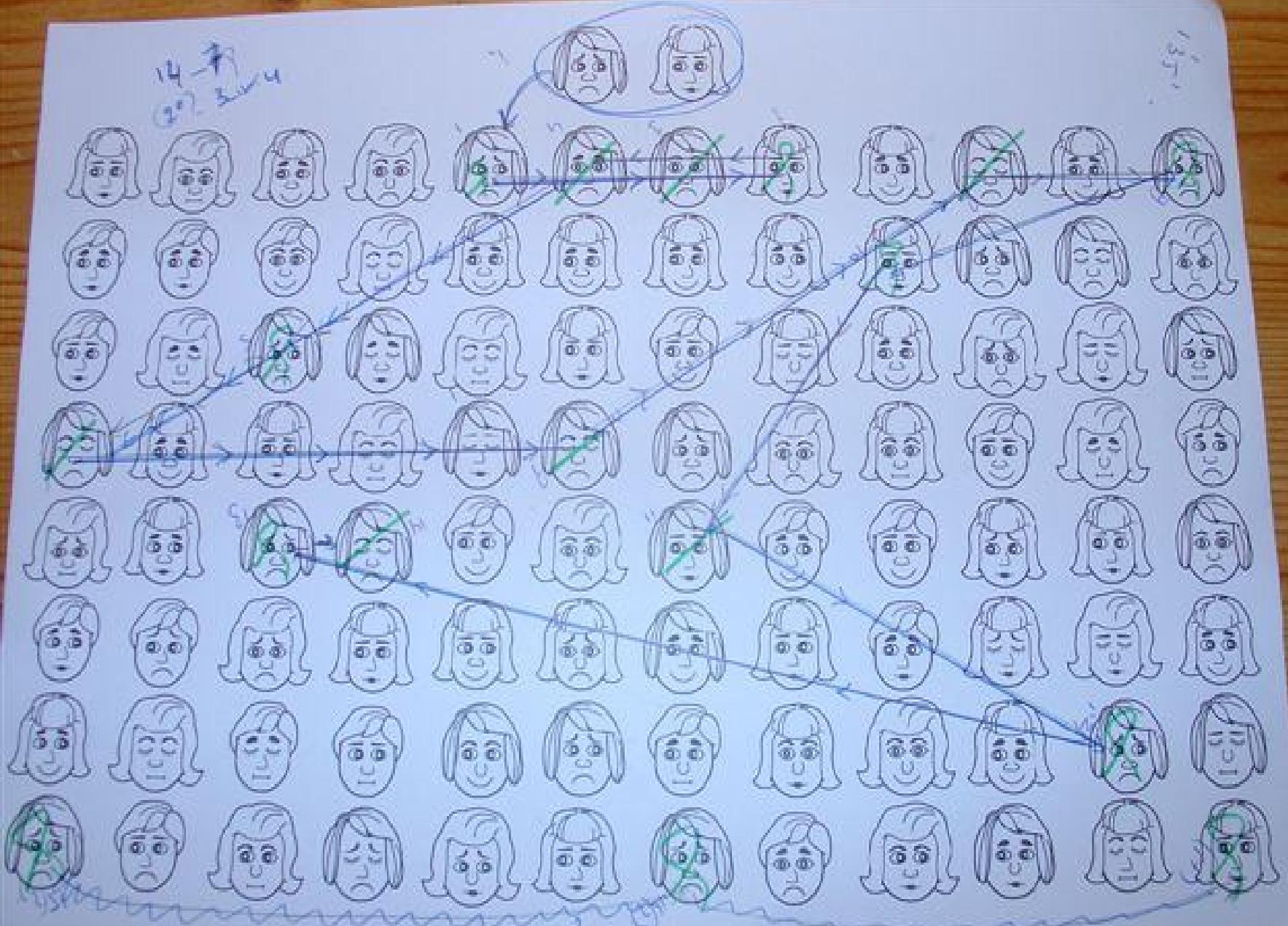
Regular education

Reads well, since '09  
magnifying

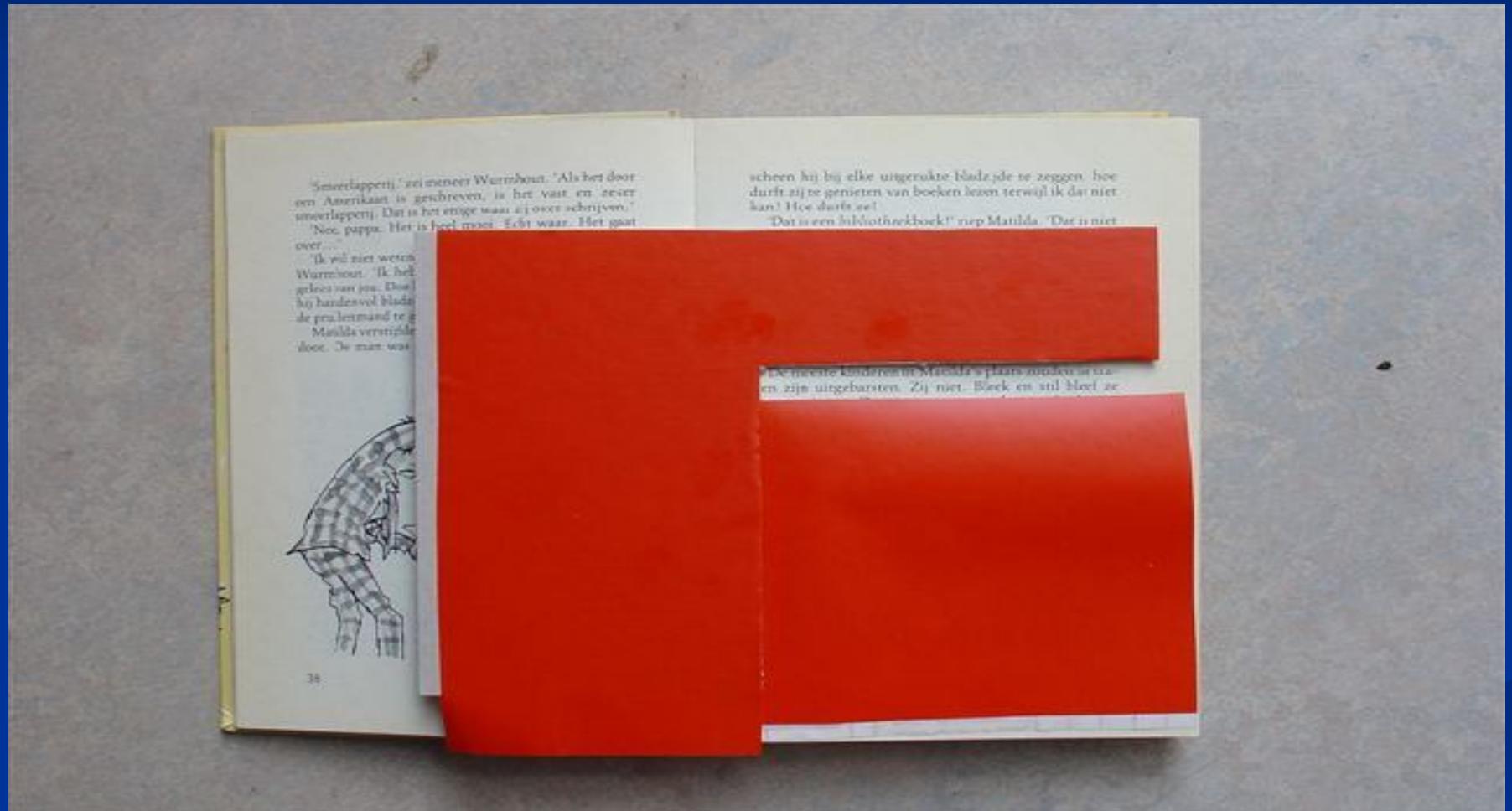
Likes working at  
computer a lot (.16  
letters)



♂ 7yr in group 1, asphyxia?, acuity ang =lin 0,6, higher visual functions +



# Learning to read with mals



'Sneeuwlapperi,' zei mevrouw Wurmbeest. 'Als het door een Amerikaan is geschreven, is het vast en zeker sneeuwlapperi. Dat is het enige waar zij over schrijven.'

'Nee, pappa. Het is heel mooi. Echt waar. Het gaat over...'

'Ik wil niet weten Wurmbeest. Ik heb gelees van jou. Doe bij handenvol bladzijde prullimmand te...

Matilda verontstond doort. De man was



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scheen hij bij elke uitgedrukte blaatzijde te zeggen, hoe durft zij te genieten van beeken lezen terwijl ik dat niet kan! Hoe durft ze!

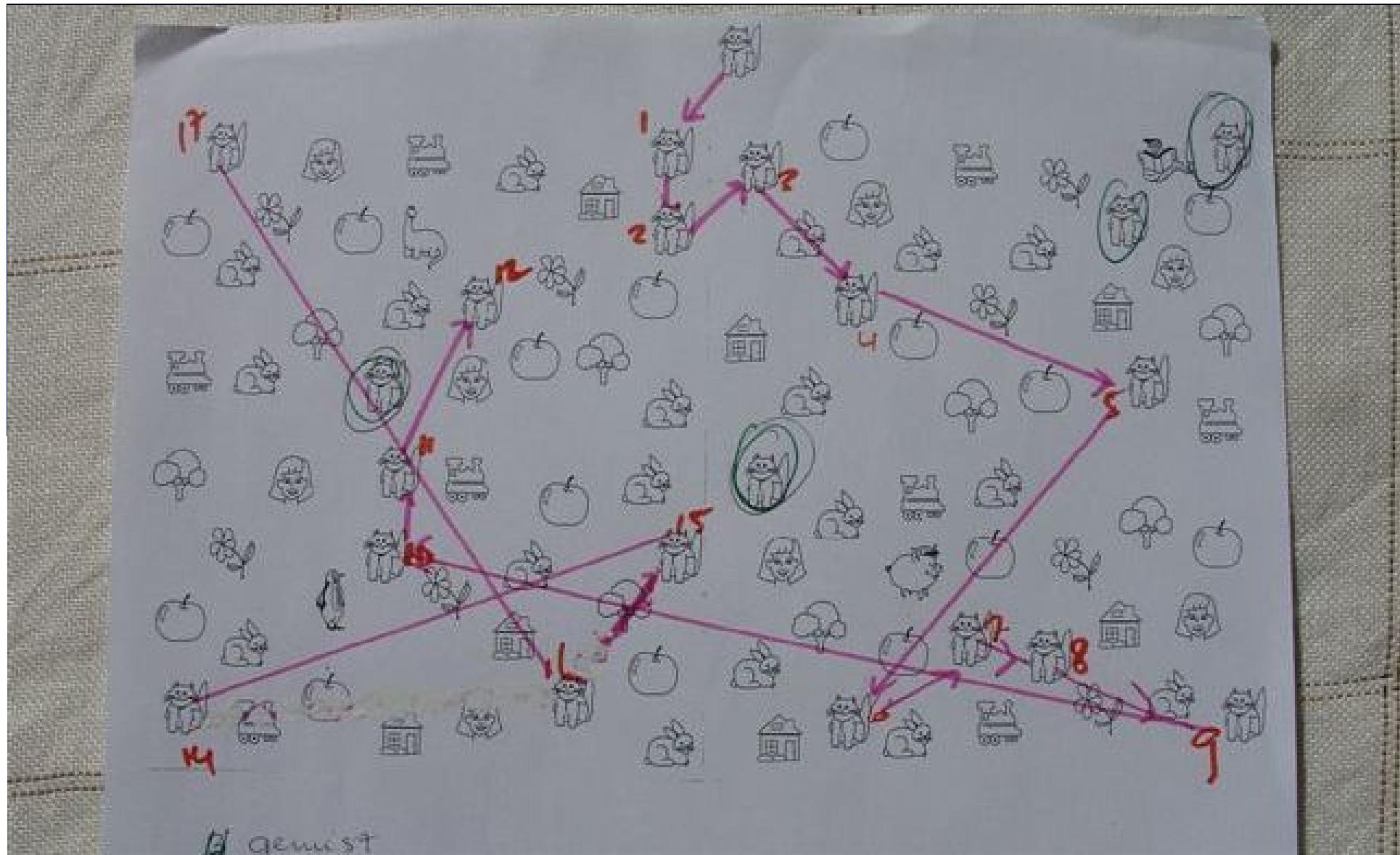
'Dat is een bibliotheekboek!' riep Matilda. 'Dat is niet

De vrienden kinderen in Matilda's plaats zouden in traan zijn uitgebarsten. Zij niet. Haar en stal bleef ze sten peinzen. Ze scheen te weten dat van huiler en ruielen nog nooit iemand beter is geworden. Het enig erstandige dat je kunt doen wanneer je wordt aangevallen, is in de tegenaanval gaan, heeft Napoleon eens gezegd. Matilda's fantastische, subuele brein was al eruk bezig een nieuwe gepaste straf te bedenken voor haar valse vader. Het plan dat ze uitbroedde hing er vandaan of reds papegaai echt zo goed kon praten als Fred beweerde.

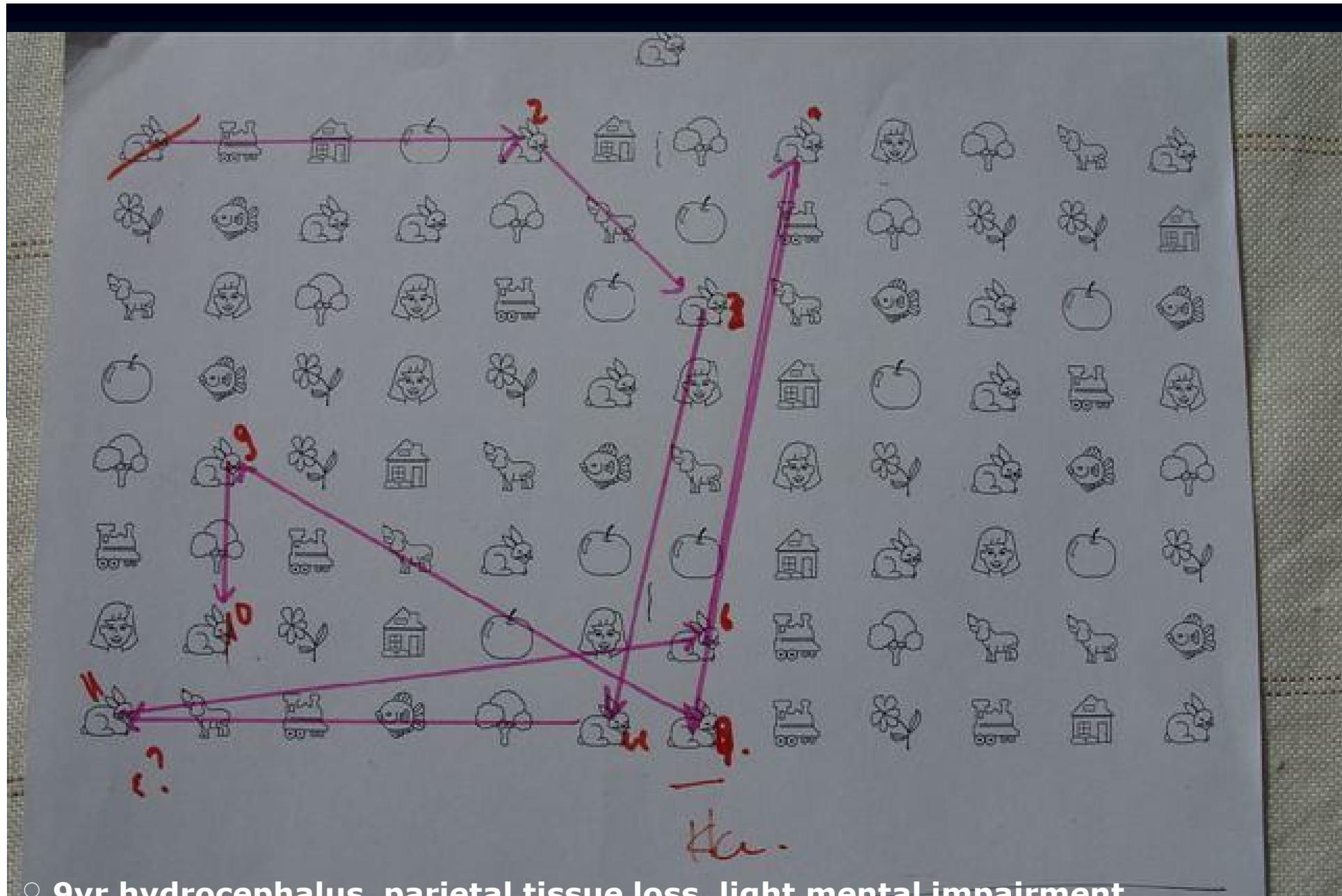
Fred was een vriendje van Matilda. Hij was een jongen van zes jaar dat om de hoek woorde en hij liep al dagenlang op te scheppen over de pratende papegaai die hij van zijn vader had gekregen.

Zodra haar moeder de volgende dag in de auto was gestapt, op weg naar haar bingoclub, ging Matilda naar reds huis om het te onderzoeken. Ze keerde aan en vroeg of hij zo vriendelijk wilde zijn haar die zo geroesemde vogel te laten zien. Fred was enthousiast. Hij nam haar mee

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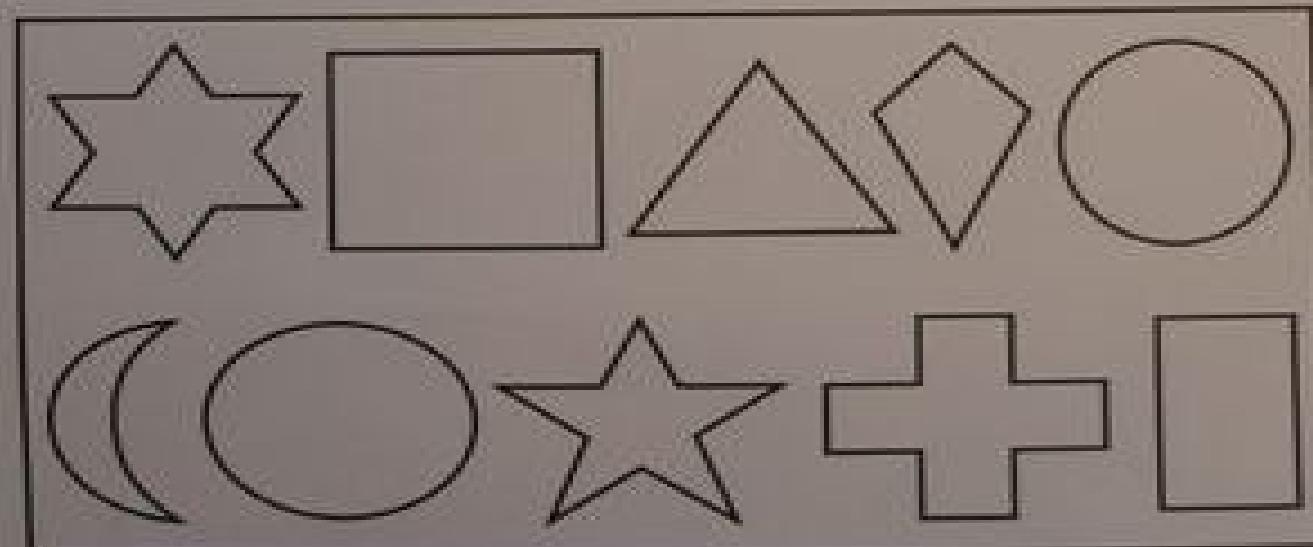
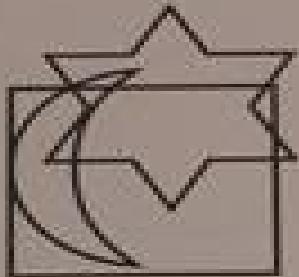


♀ 9yr hydrocephalus, parietal tissue loss, light mental impairment, started reading. Acuity angular=linear 0,3, small attentional field, higher visual functions at developmental level.



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10.



Trouble engaging-disengaging quickly

♂ 8yr premature birth 27 wk 850 gr  
**ROP I**

OS

S-2.25,C-1.15

Angular 0.6

Linear 0.4

Near 0.2

Visual field: slightly limited on right side

Normal IQ

Hearing aids, verbalwm -, wordfindingproblems

**DTVP-2**

Form constancy 13 (m 10)

Position in space 6

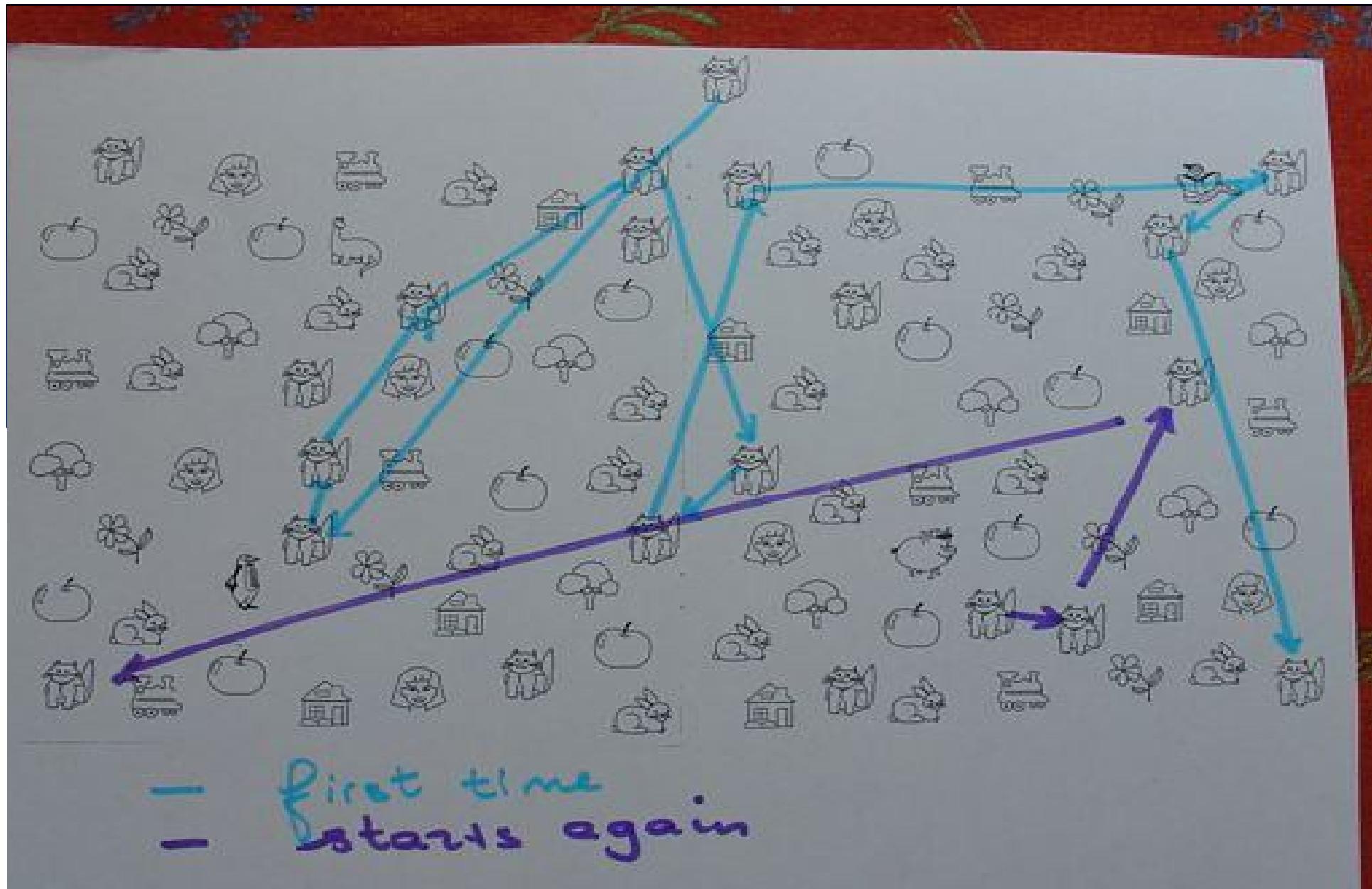
Visual closure 4

Figure-ground 11

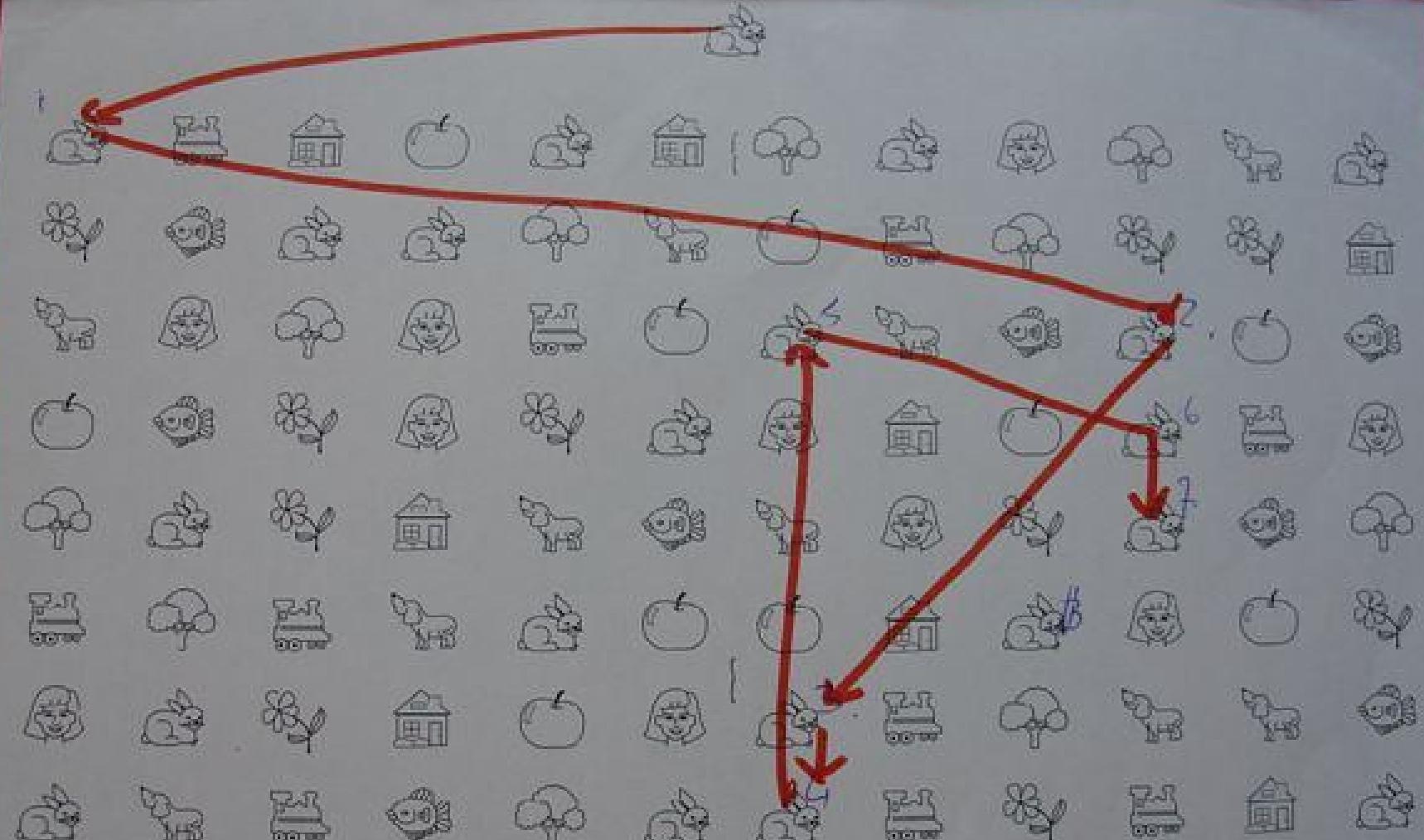
Has good spatial orientation

**VMI** (Beery) 6,5 yr

Now: likes magnified letters (no frame) from the start



♂ 6 yr, premature birth (30 wk), PVL, CP, normal VIQ  
Acuity: 0,8 ang, 0,4 lin, higher visual functions +



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# CVI and reading

Aspect child↓	problem	SI/M	ang	lin	vntr	drsl- SOFB	orien- ting	reading	Lg/VWM	Time cpts sequ
11yr	Prem ROP Hydroc	+	+	0.08	0.08	-	+	++ With TV	+	+
11yr	↓ brain tissue	-	+	0.6	0.6	+	±	++ magnif '09	+	±
14yr	Prem PVL	-	+	0.7	0.7	+	-	++ mal smtims	+	
9yr	Hyd, Par tl	-	+	0.3	0.3	+	+	- with mal +	+	
10 yr	Asphyxia?	-	+	0.6	0.6	+	+	- with mal +	+	±
8yr	Prem ROP H aids	-	+	0.6	0.4	+	+	- magnif from start, no mal	±	-
6yr	Prem PVL CP	-	-	0.8	0.4	+	+	≠mal Wide apart	+	+
8yr	Cng nystag	-	+	0.5	0.3	+	+	±	±	-
11yr	Asphyxia?	?	±	0.8	0.6	+	+	-	±	-

CVRS Cardiff June 2009

# conclusions

- magno path involved in early reading problems
    - lin <ang, (selective visual attention)
    - engaging/disengaging speed ↓  
**Solution:** early magnifying
      - visual orienting  
**Solution:** mals, frames and windows –  
the attentional spotlight seems to learn what to do this way
  - dorsal path involved in later reading problems
    - visual complexity, too much letters and lines too close to each other (simultaneous visual processing)
- Solutions:** covering/splitting up, magnifying, computer use
- CP: this + frontal presentation

- standard dyslexic assessment procedures should include this elements
- CVI assesment/ rehabilitation  
3 path way thinking!
- better naming for subproblems