Reading Comprehension and Inferences: Comparison of Learning Disabled and Second Language Speakers

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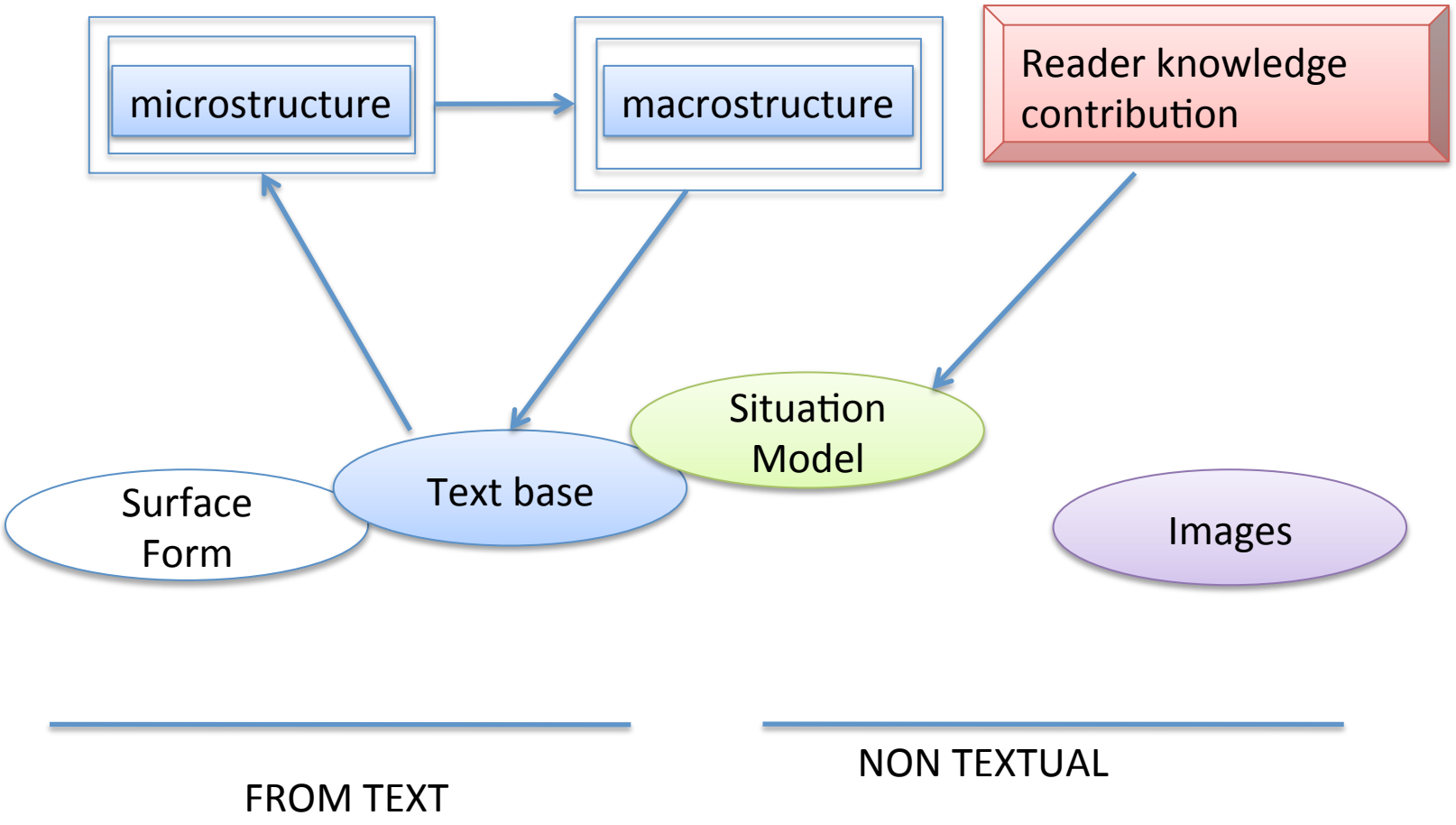
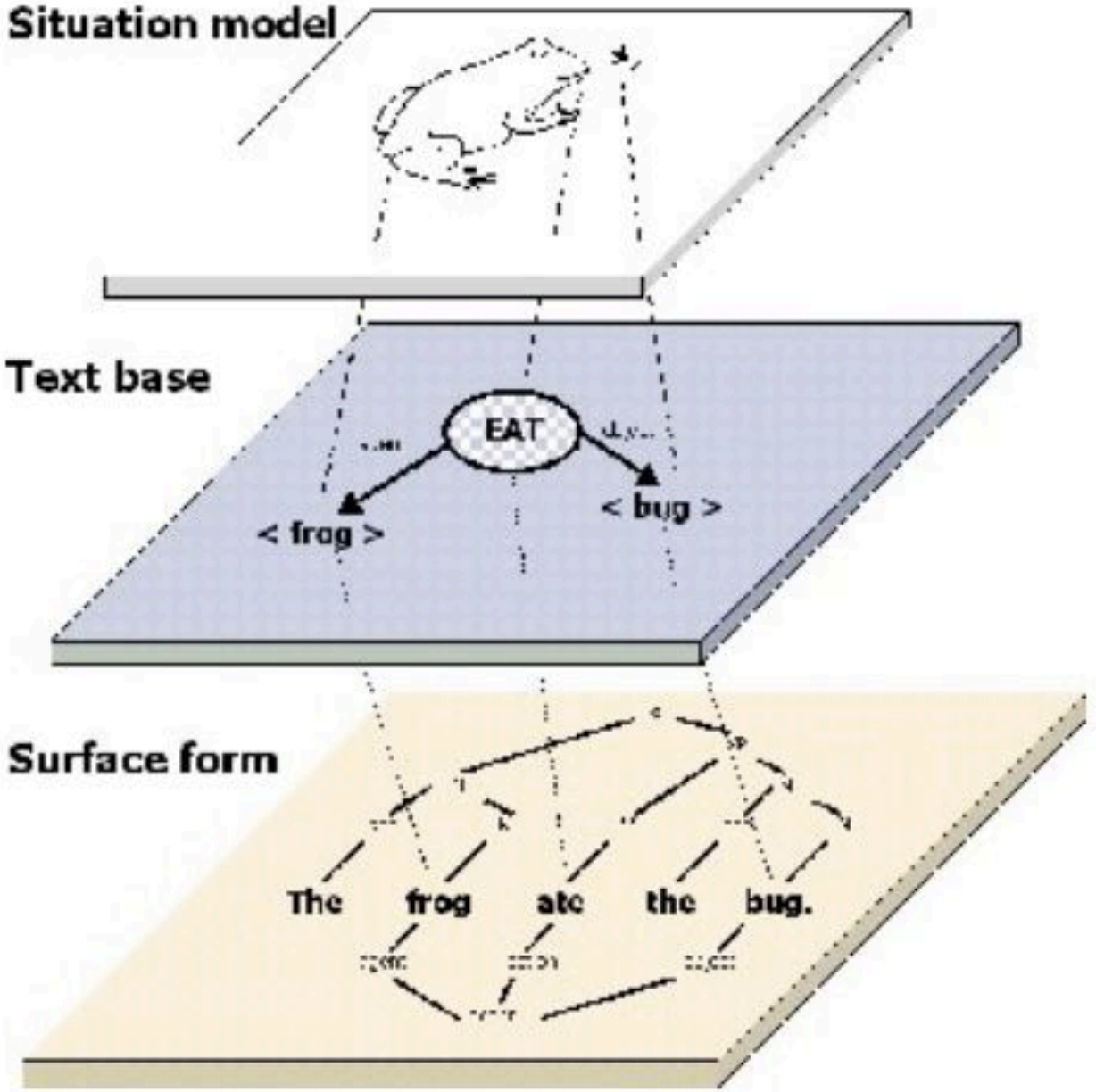
Reading comprehension

- Kintsch et Van Dijck (1978) and Kintsch (1983) present a model where, while reading, learners process information triggering the elaboration of mental representations essential for comprehension.
- Kintsch (1983) proposed two phases: construction and integration.
- For construction, readers choose information, activate schemas, and store pertinent information in the long-term memory.
- During integration, they prune non-essential information.
- Finally, readers build new networks for the information from the text being read.

Reading model of Kintsch and Van Dijck from Blanc et Brouillet (2003:70)



Fletcher(1994); van Dijk & Kintch(1983); Zwaan & Radvansky (1998)



C-I model (Kinstsh,1998)

- 2 levels of representation
  - Text Base
  - Situation model
- 2 steps: Construction- Integration

C-I model (Kintch, 1998)

- Construction : Through schema activation, readers add information wich are not in the text.
- Integration: Readers desactivate inappropriate constructions by inhibiting irrelevant material and improving relevant elements.
- That is, during construction-integration, readers make inferences

Context: Gender differences in reading comprehension

- Gap between boys an girls gets larger as the grade level increases
  - according to a longitudinal evaluation of National Assessment of Educational Program (Klecker, 2006)
  - according to Pan-Canadian Assessment Program

Differences between gender

- Among all country participating of OECD, Pisa (2009) showed that girls outperformed boys in reading literacy. It is the same in Canada
- So, the Council of Ministers of Education, Canada decided to search what could explain this difference and Chuy and Nitulescu (2013) conduct a research for them.
- They used Pisa (2009) «data set to investigate and isolate the factors contributing to the gender gap in Canada»

Chuy and Nitulescu (2013) research

- Pisa's assessment asked student many questions about strategies they used
- They found:
  - «*Meta-cognitive strategies: girls were more aware of the most effective meta-cognition strategies compared to boys……. The female advantage was particularly large for the index of* ***summarizing strategies***»
  - «Results of Simple Linear Regression Models: *summarizing strategy which explained 16 per cent of the variation in reading scores alone*» [1]

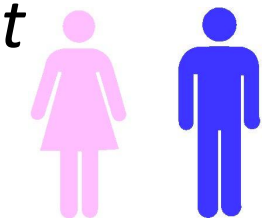
1. Assessment Matters! No. 5, 2013 – CMEC p.7

Chuy and Nitulescu (2013) research

- «*if Canadian boys were as aware of effective summarizing strategies as girls are, their reading score would increase by 15 points (see OECD, 2010b, table III.3.4*)»
- For explaining the gender gap they made Oaxaca-Blinder decomposition
  - They found enjoyment of reading is important for explaining the gap, but does girl enjoy better reading because their reading skills are better?

Chuy and Nitulescu (2013) research

- *«Besides enjoyment of reading, two reading strategies showed significant and important contributions to the gender differences in reading: control and summarizing.*
  - *Control is a cognitive strategy focusing on understanding a task's purpose and its main concepts,*
  - *Summarizing is a meta-cognitive strategy reflecting an awareness of the most efficient to condense information»*. [1]



1. Assessment Matters! No. 5, 2013 – CMEC p. 7

Oakhill , Cain et Yuill (1998)

Good readers

- Good text representation
- Long term memory easy access

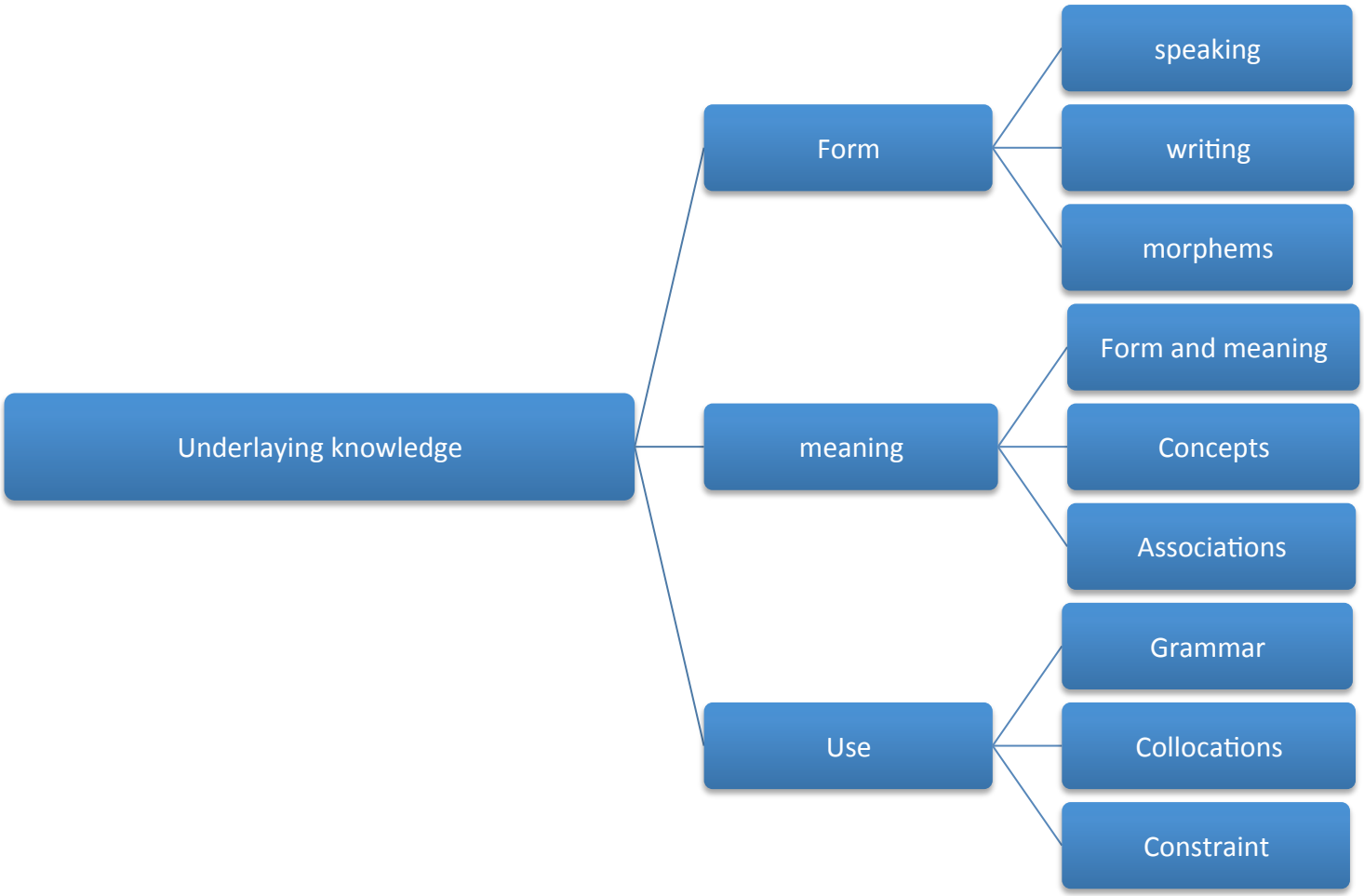
Weak readers

- Cognitive overload

Theoritical framework

- READING COMPREHENSION
  - Depends on linguistic knowledge related to:
    - Syntax
    - Text structure
    - Vocabulary - deep knowledge of a word
    - Prior knowledge
- Word knowledge is central in the systems involved in reading comprehension (Perfetti and Stafura,2014)
- But, beyond these linguistics facts, are there other factors at play?

Knowledge for a word (Nation 2001)



And inferencing

- Inferencing is going beyond the explicit information in the text.
- For inferencing, we should activate our prior knowledge, link information

To infer

- We must first have a good lexical representation (Perfetti 2007)
  - Phonological representation,
  - Orthographic representation
  - Semantic information
- While reading, lexical representation is activated depending on the context
  - When reading a well known word= rich semantic representation

Context

- Poor readers underperformed in making inferences in reading comprehension tests (Cain et Oakhill 1999).
- Inferences are related to prior knowledge; the more background knowledge linked to the text content that an individual has, the easier it is for him/her to make inferences
- A Non-native learners' lack of vocabulary affects reading comprehension

- Both, Non-Native (NN) and Learning Disabilities (LD) students demonstrate reading comprehension problems
- The links between the ability to infer and reading comprehension were demonstrated (Yuill et Oakhill 1991, Cain et Oakhill 1999)

L2 and inferencing

- Weak readers have difficulty making inferences to understand a text (Cain et Oakhill 1999).
- The quality of the L2 lexical representation influences their ability to make inferences (Cain 2010)

Types of inferences no unanimity about the range

- **Text-connecting** or Coherence inferences (Bowe-Crane & Snowling, 2005) (Cain & Oakhill (1999)
- **Gap-filling** or Elaboratives inferences (Bowe-Crane & Snowling, 2005) (Cain & Oakhill (1999)

- Local inferences: (coherence) (Kylene Beers , 2003)
- Global inferences: covert the whole text (Kylene Beers, 2003)

- While reading (on line) (Grasser et al 1994; Long et al 1996)
- After reading (off line) (Grasser et al 1994; Long et al 1996)

Research Question

- Are difficulties in making inferences the same for NN and LD students?
- Does Boys and girls have same scores?

Method

- Students: (n=580)(grade 3 to grade 6) attending French schools in Montréal aera.
  - 386 L1- Normal Achiever
  - 152 L2- Normal Achiever
  - 42 L1- Learning Disabilities
- Test
  - Narrative text
  - Inferences questions
- Procedure
  - Group task in their classroom with other linguistic tasks- text avalaible for answering questions.

B. Reading comprehension task

- Group narrative text reading
- Inferencing questions

C. Other tasks

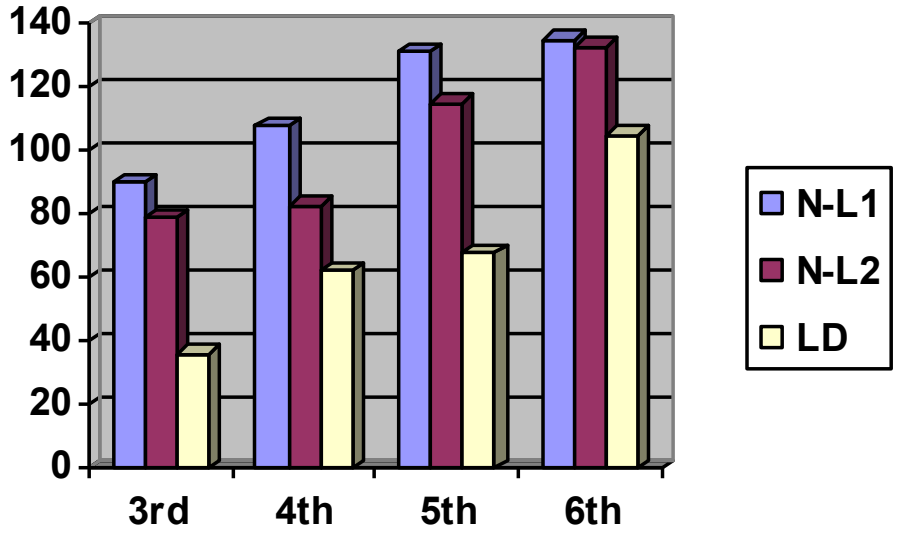
- C-Test
- Writing production
- Understanding synonyms task
- Comprehension of idiomatic phrase task

Correlations between reading comprehension and other tasks

- Extern validity with other tasks: high correlations with reading comprehension:
  - C-test (r=0,341 at p=.000),
  - Writing production (r=0,443 at p=.000),
  - Understanding synonyms task (r=0,500 at p=.000),
  - Comprehension of idiomatic phrase task (r=0,450 at p=.000);

Results

- Normal L1 > Normal L2 > Learning Disabilities
  - Normal L1 and LD (F(1,427=39,975 p=0,000)
  - Normal L1 and Normal L2 (F1,517=16,358 p=0,00)



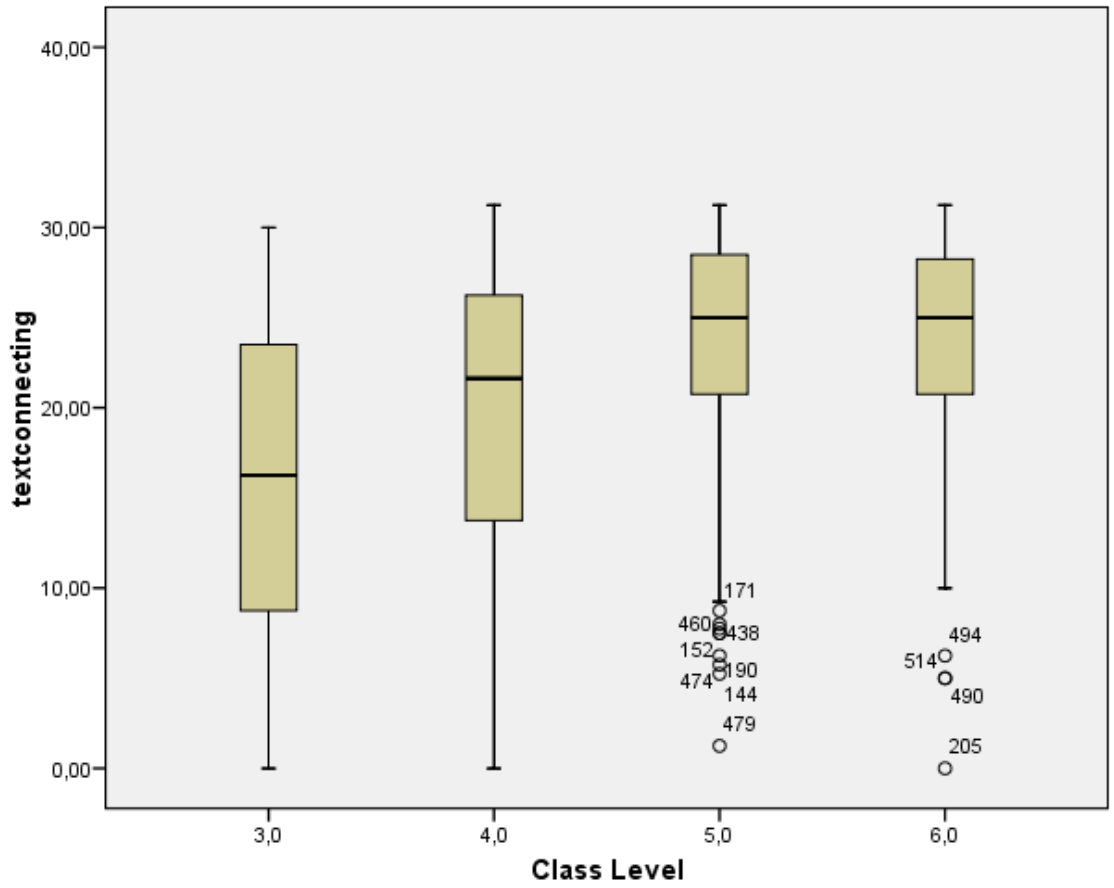
ANOVA showed significant differences between grades
F (4, 579)= 44, 643 p= 0,000

Questions classification

- According to Cain & Oakhill (1999) , we grouped inferences in 2 types:
  - Gap-filling inferences: integration of general knowledge with information provided in the text. (Baker and Stein's 1981 terminology): Q1-Q2-Q3
  - Text-connecting inferences: mapping an instance of a noun specific noun to a later specific referent. (Baker and Stein's 1981 terminology) Q5-Q6b- Q7b- Q8- Q9 –Q10-Q11

- Litteral information
  - Answers is explicitly in the text- Q4-Q6a-Q7a-Q12
- Summarizing abilities
  - Find a title for the text- Q13

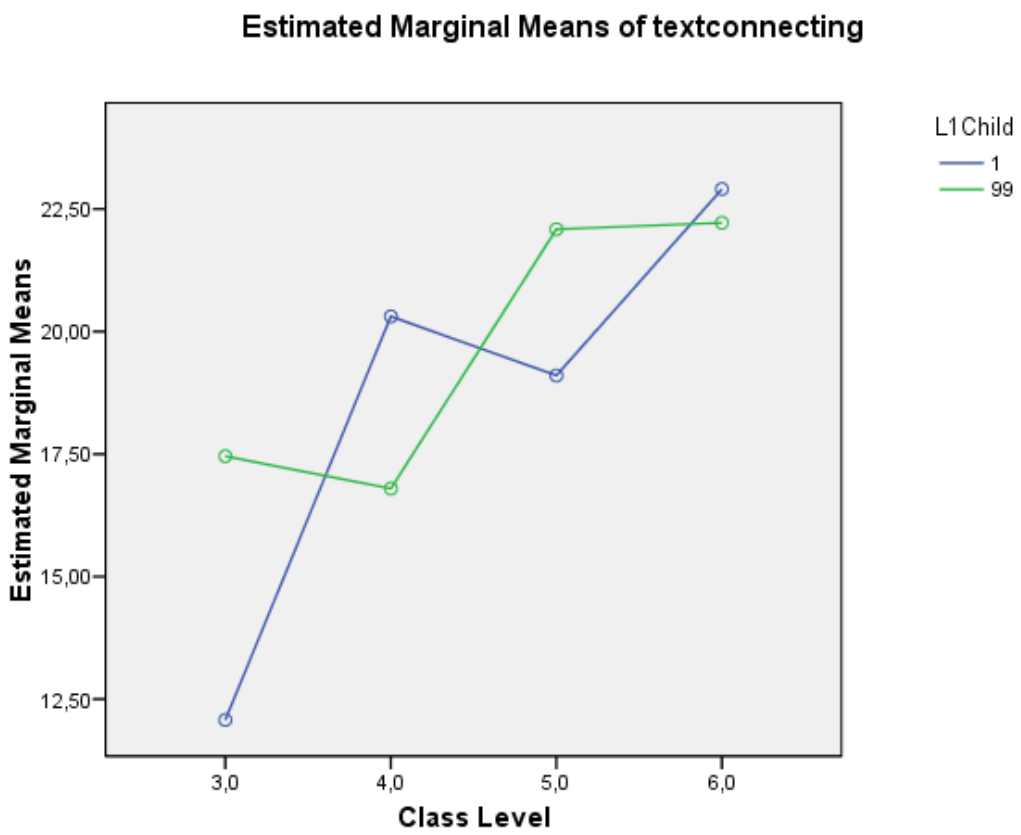
Text connecting by grade-



F (3,579)= 7,919 p=0,000

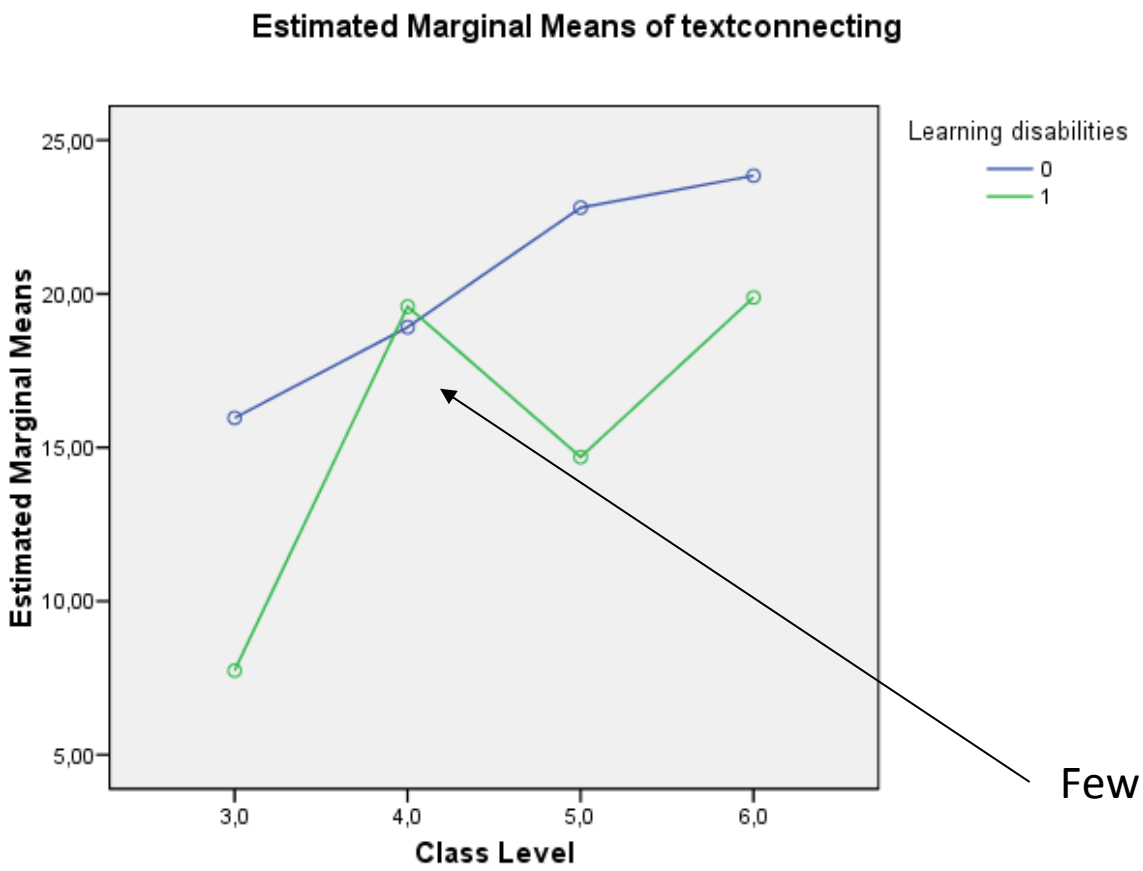
Text Connecting- L1 (not clear)

L1>L2



F (1,579)= 6,073 p< 0,014 Mean L1= 115, 45 and Mean L2= 98,9

Text-connecting- learning disabilities (32 subjects)



N>LD

LD students:

Grade N

3 14

4 5

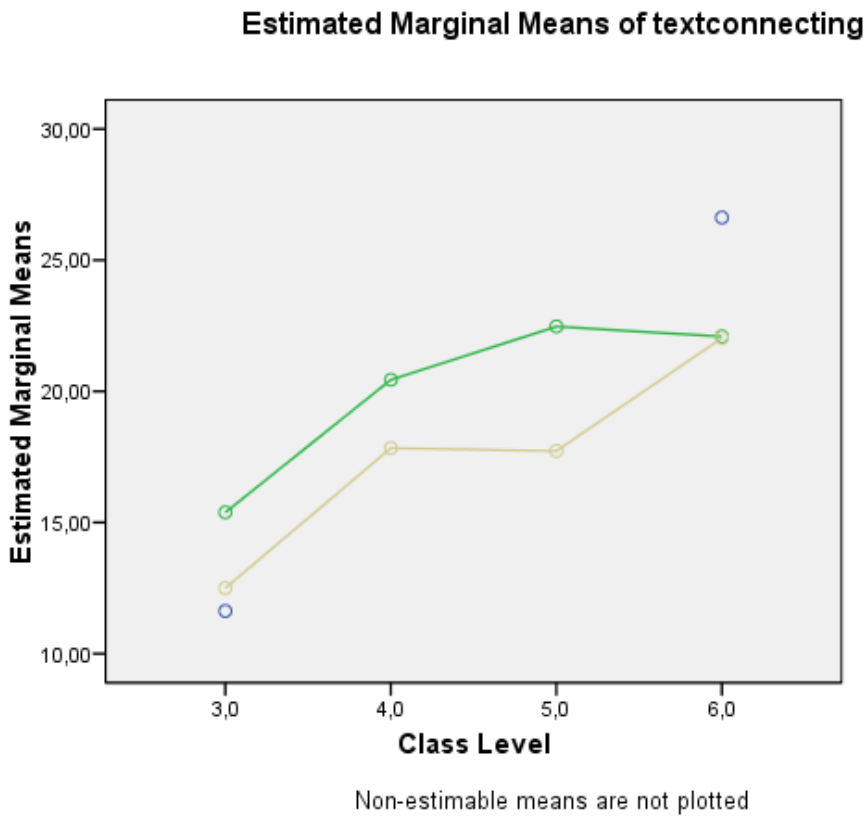
5 3

6 10

Few students

F(1,579)= 12,958 p=0,000

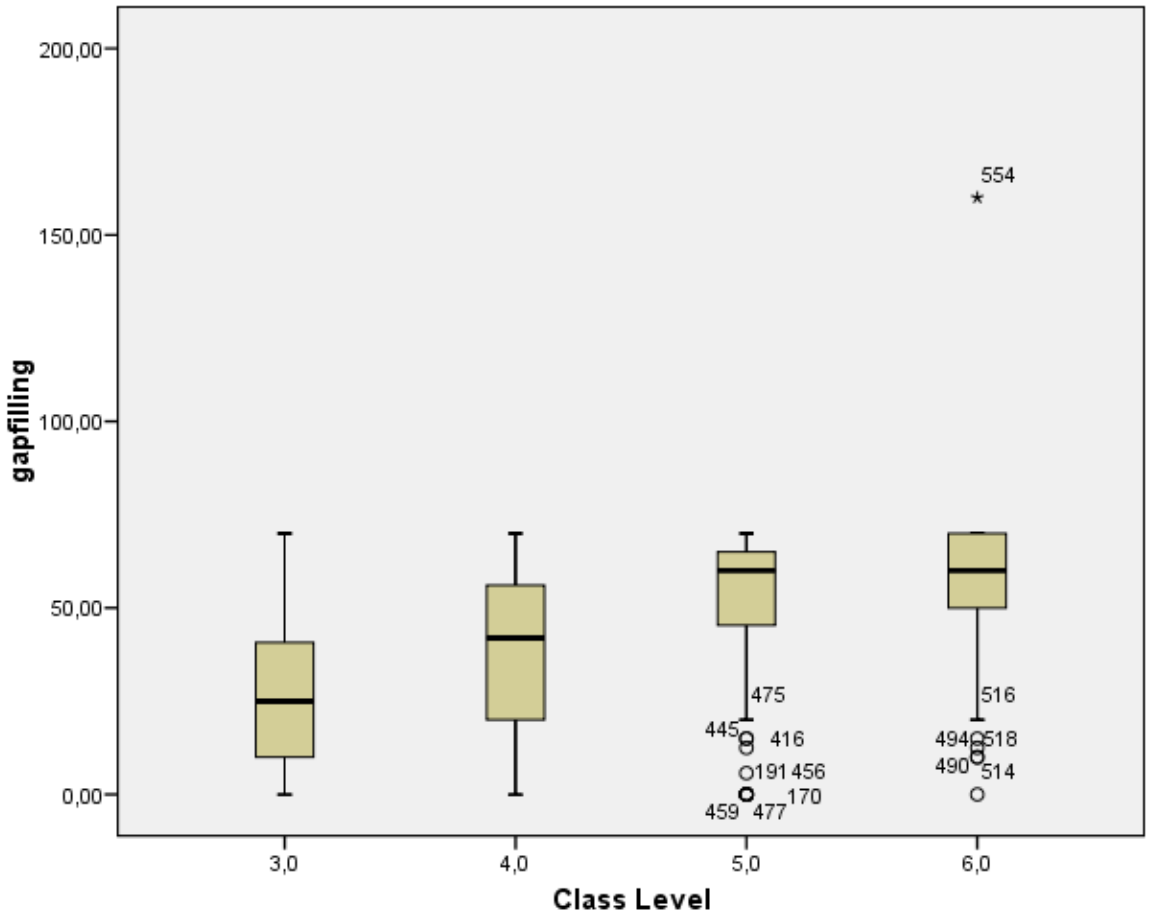
Text Connecting - Gender



Girls> Boys

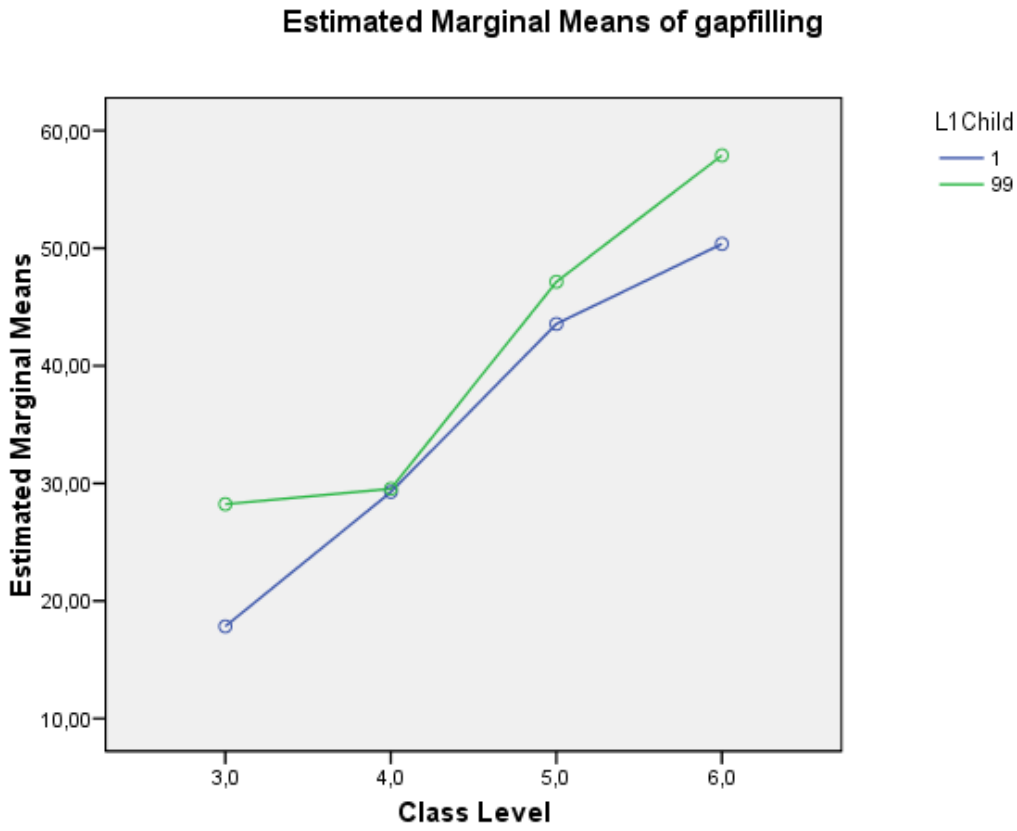
F(2,579)= 6,855 p<0,001

Gap filling by grade



F (3, 579)= 15,464 p=0,000

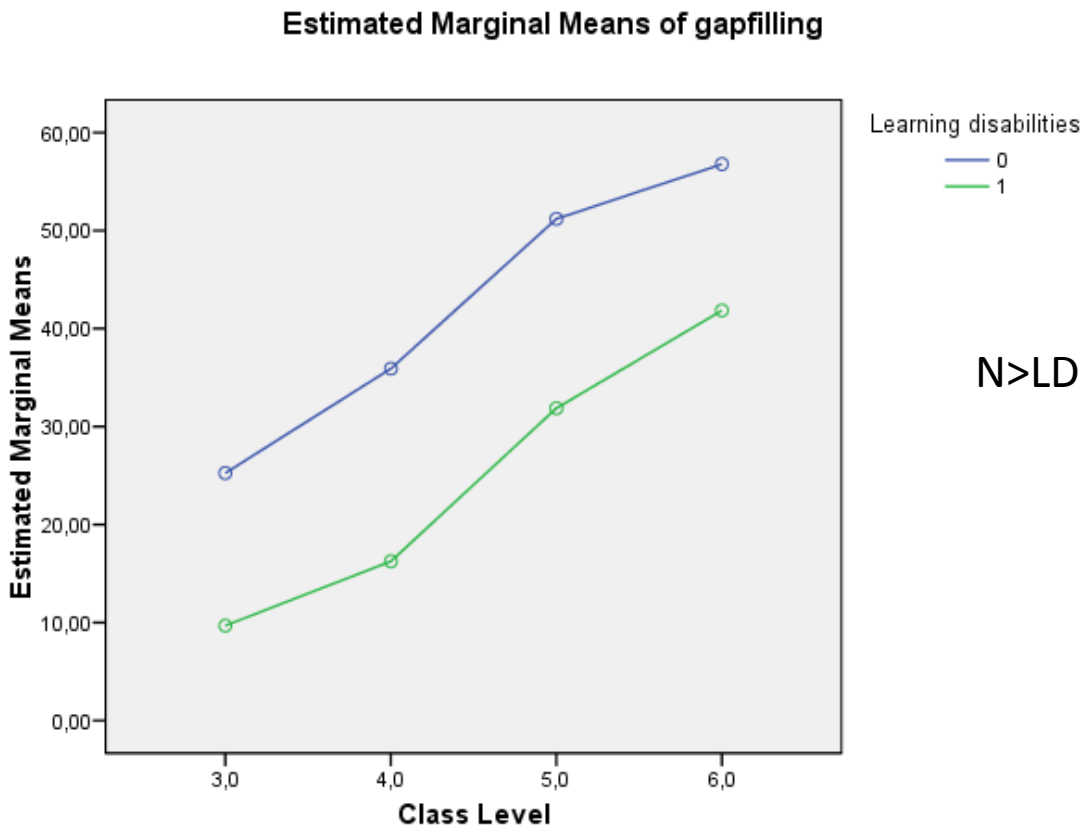
Gap filling by L1



L2 > L1

F (1, 579)= 12,364 p= 0,000

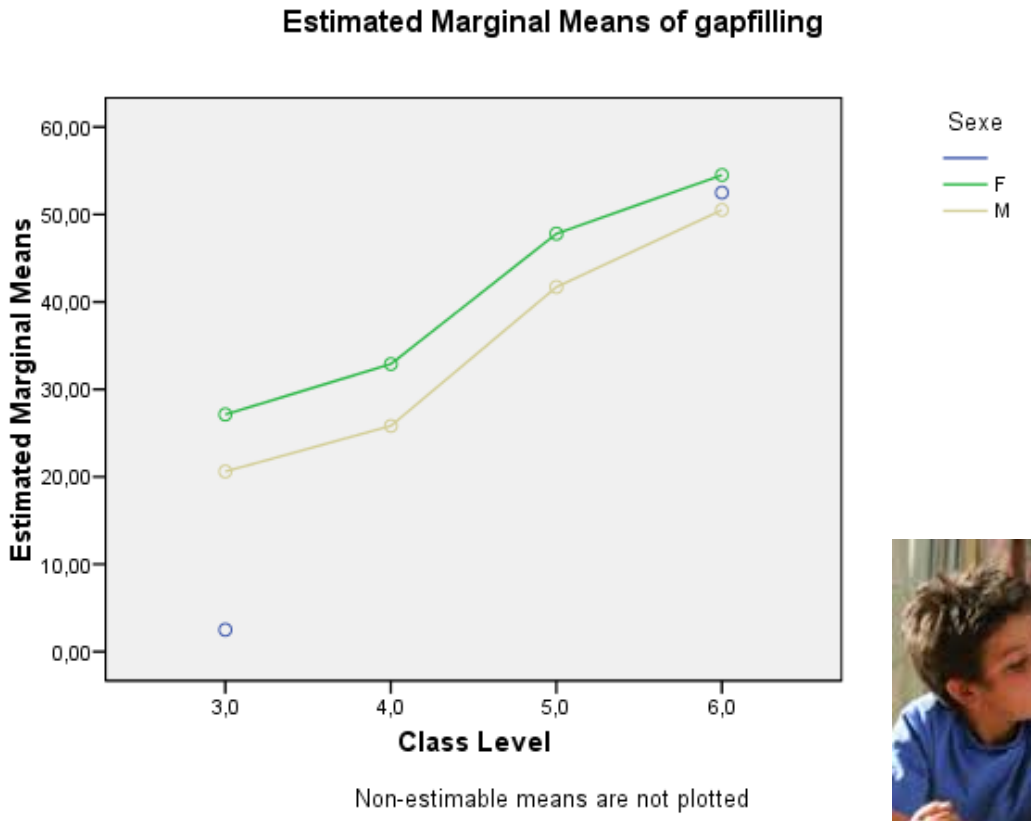
Differences for Learning disabilities



N>LD

F (1,579)= 25,233 p=0,000

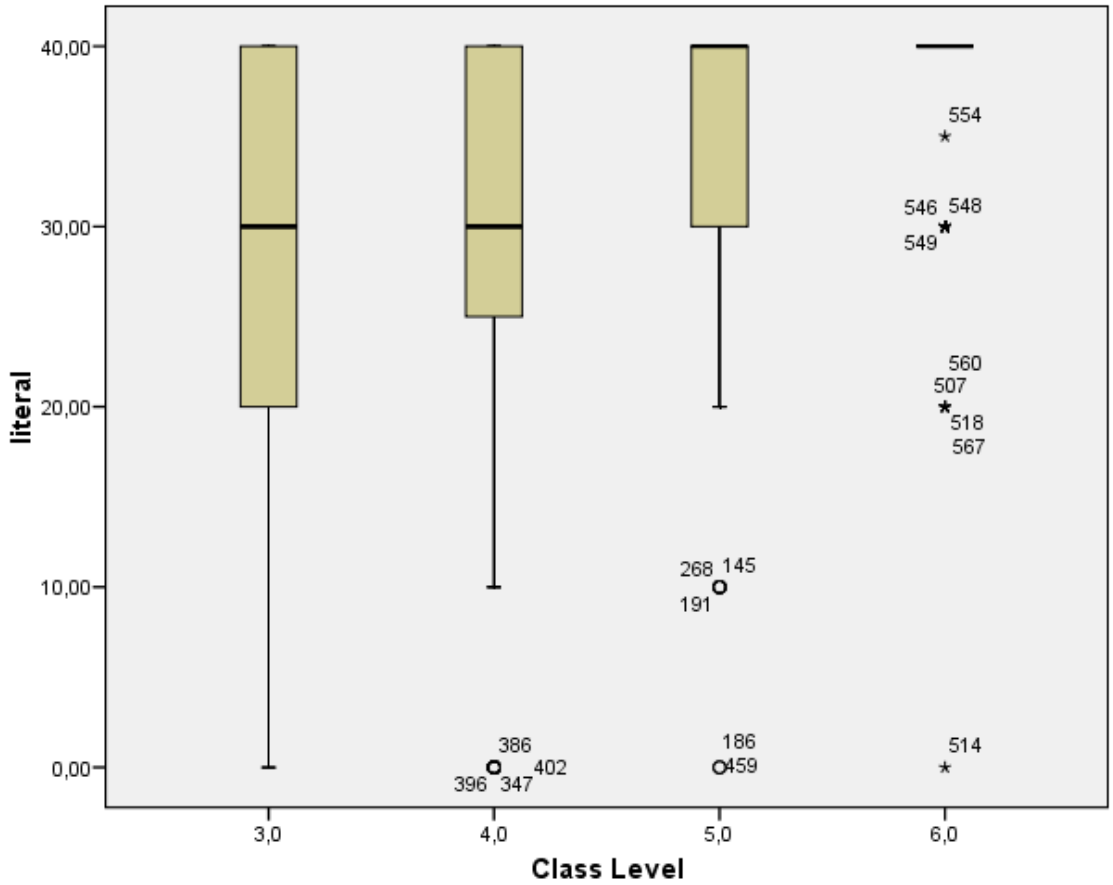
Differences by gender



Gilrs> Boys

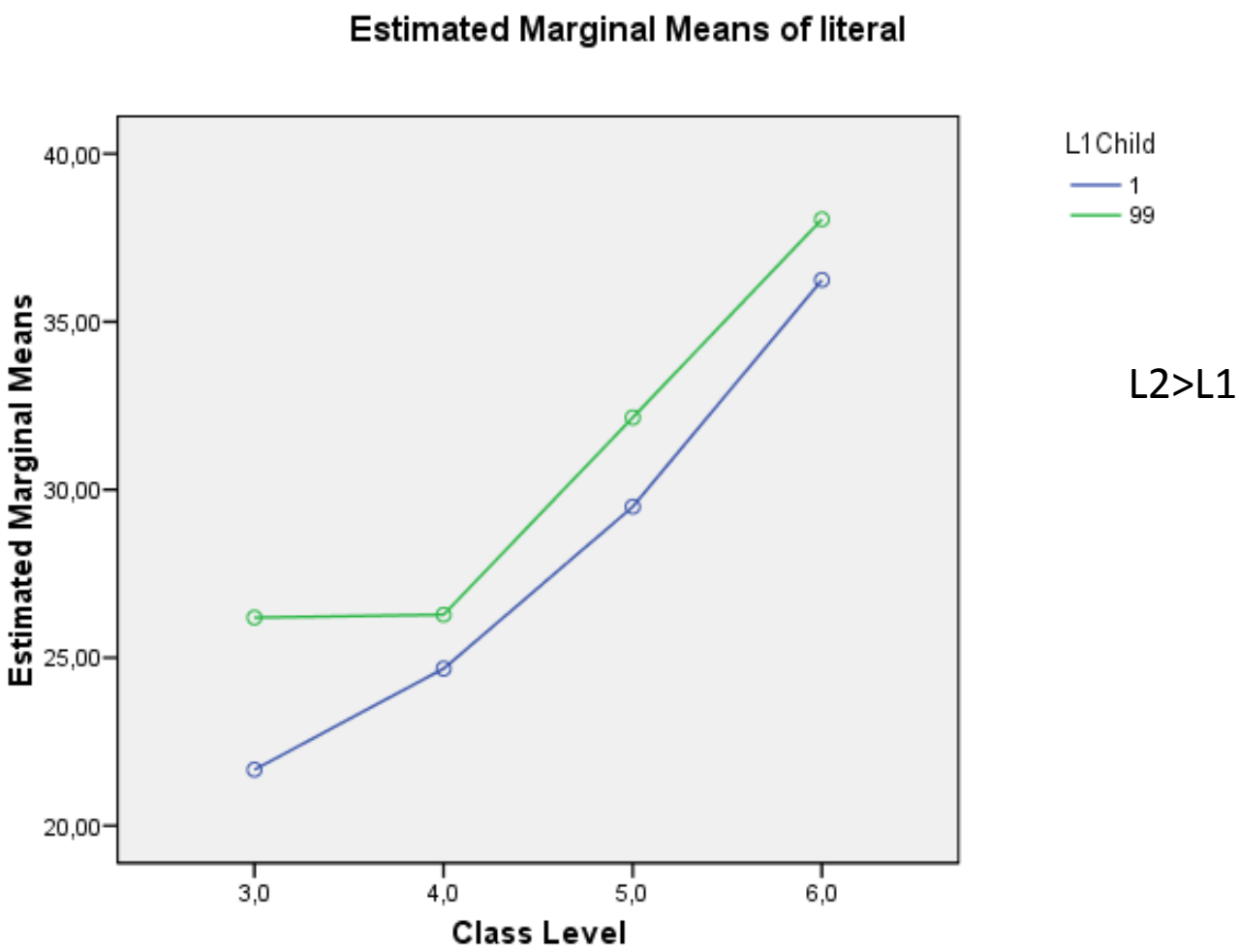
F (2,579)= 3,327 p<0,037

Literal by grade



F (3, 579)= 11,756 p=0,000

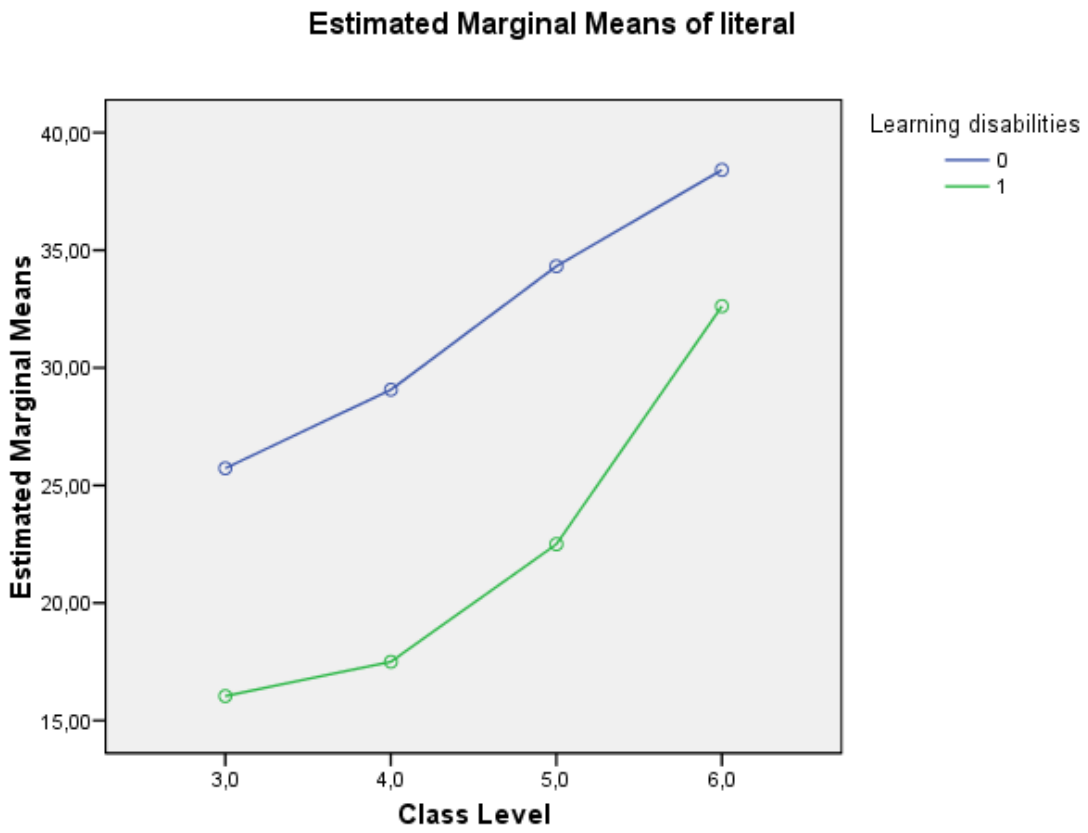
Literal L1



L2>L1

F (1,579)=9,706 p<0,002

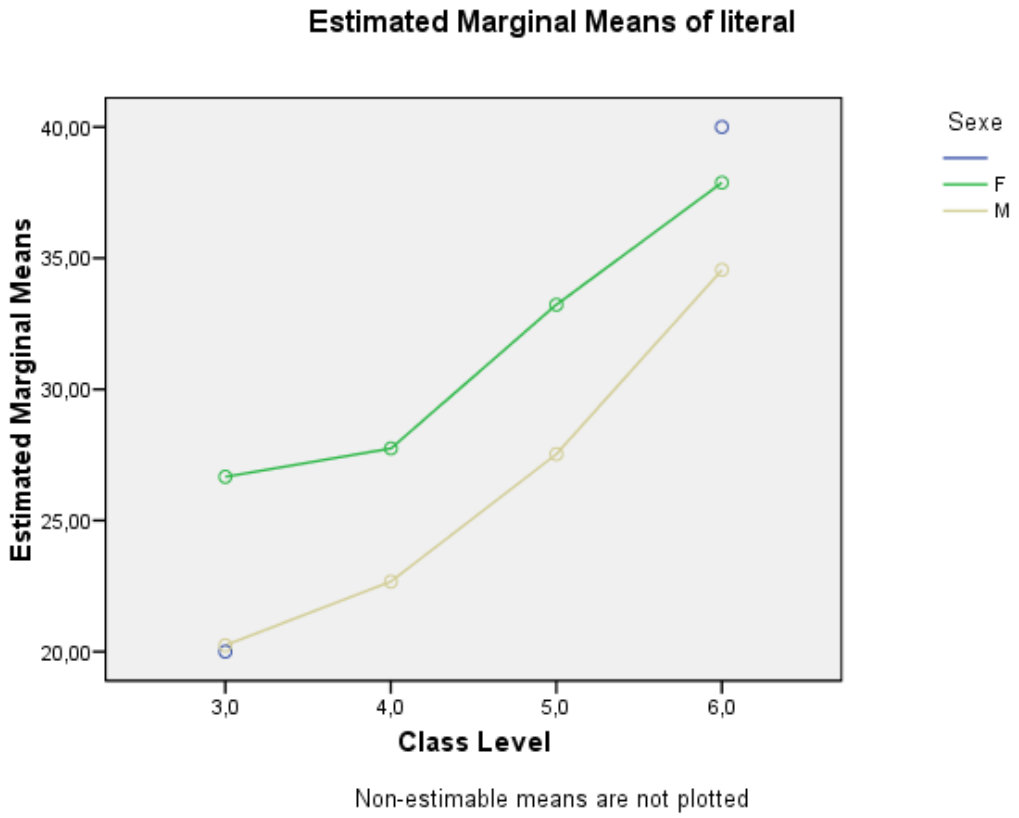
Literal Learning Disabilities



N>LD

F (1,579)= 25,742 p=0,000

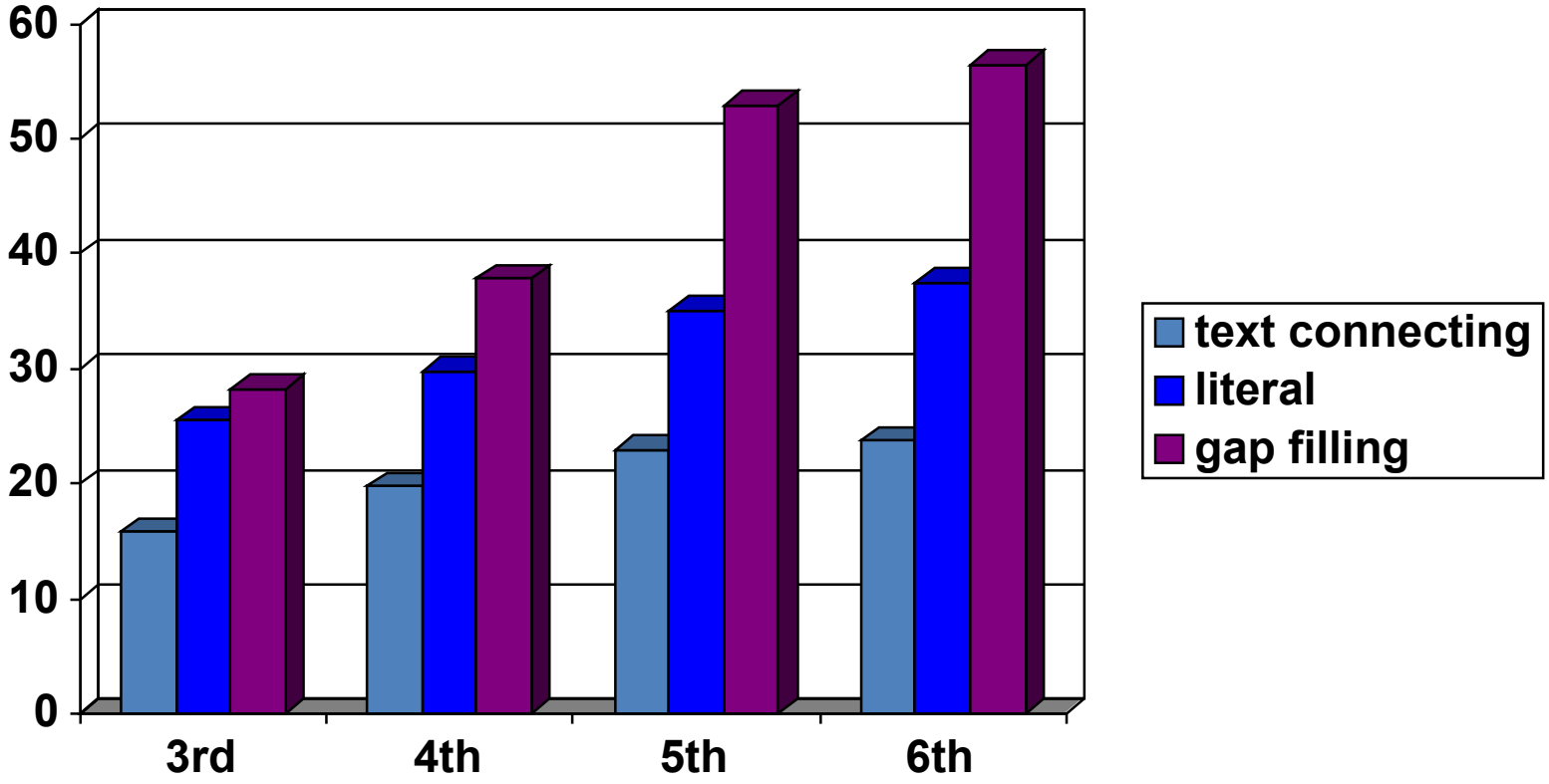
Literal by gender



Gilrs>Boys

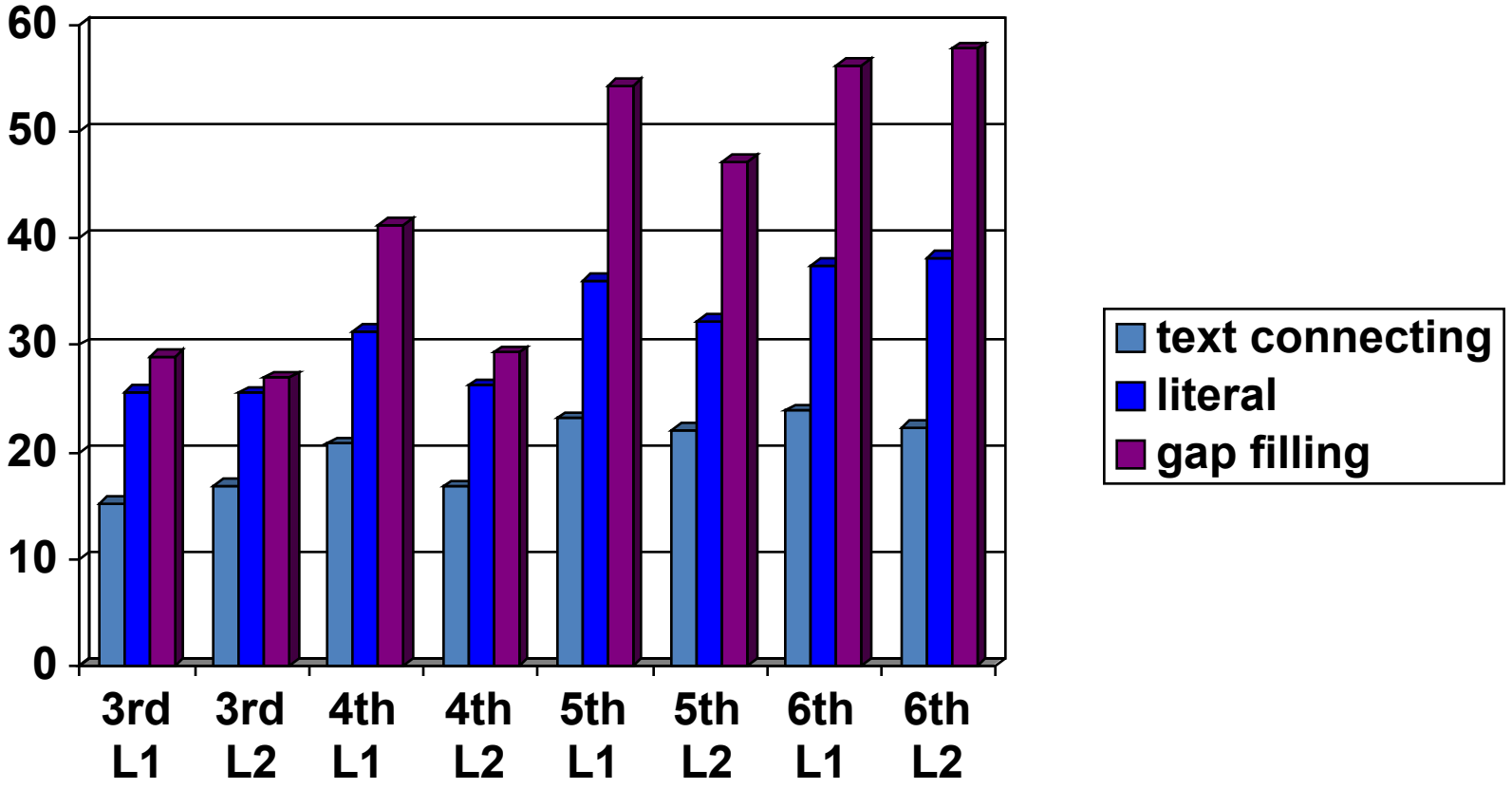
F (1,579)= 4,849 p<0,008

Discussion



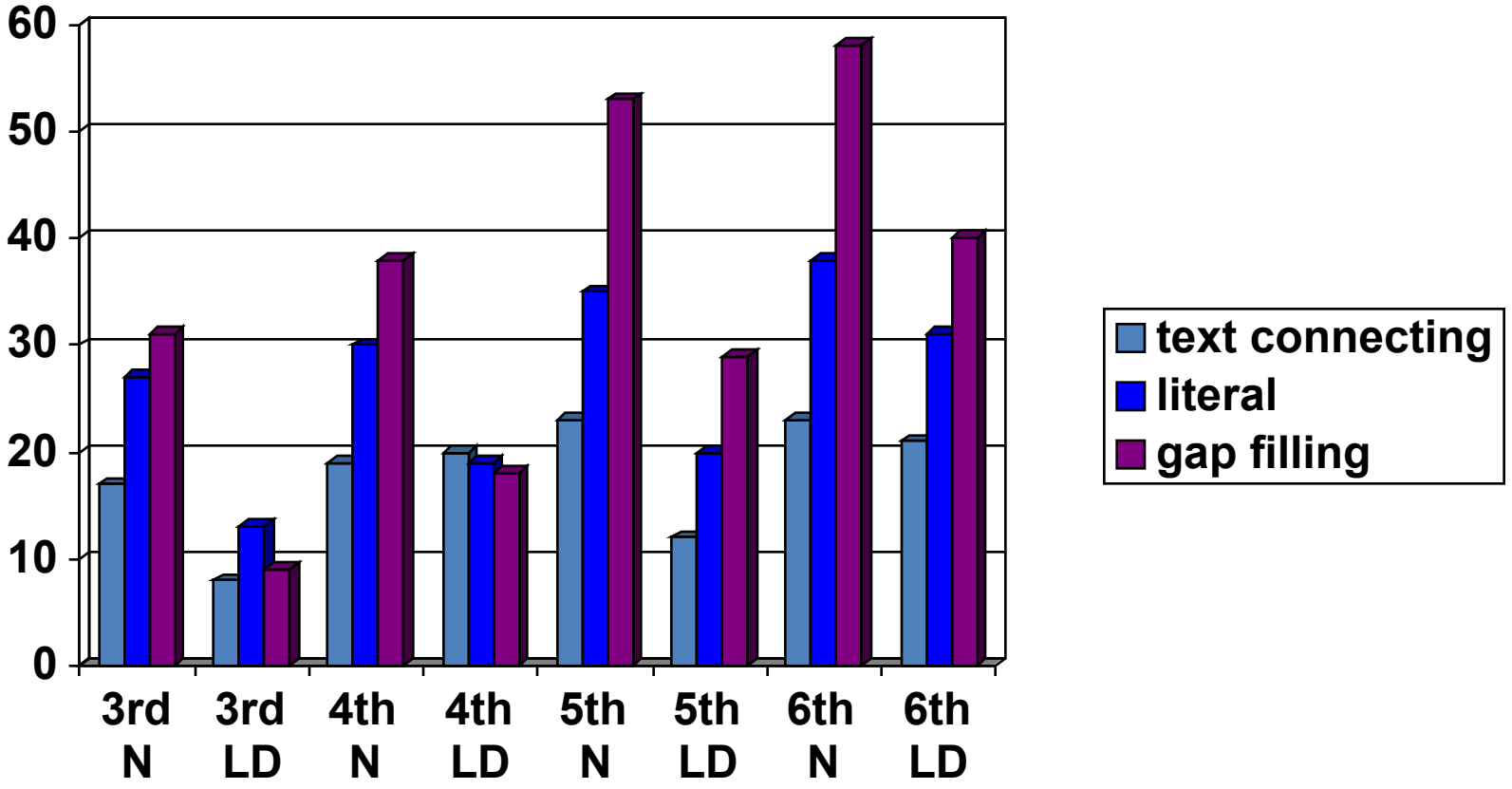
Text connecting<literal<gap filling

L1 vs L2



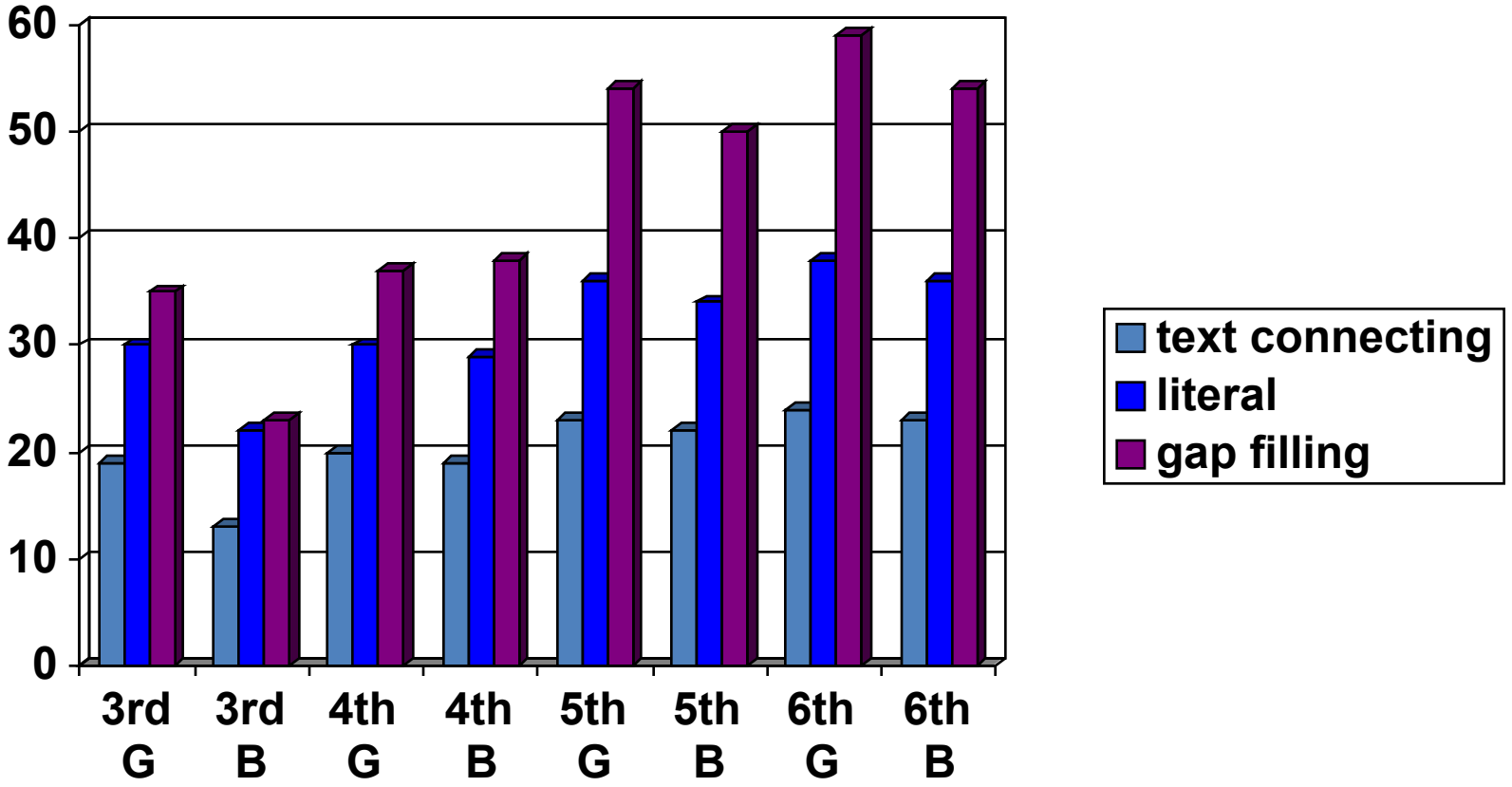
For both: text connecting< literal < gap filling

Normal achiever vs LD



In grade 3 and grade 4 LD are different from Normal achiever few students could explain the differences

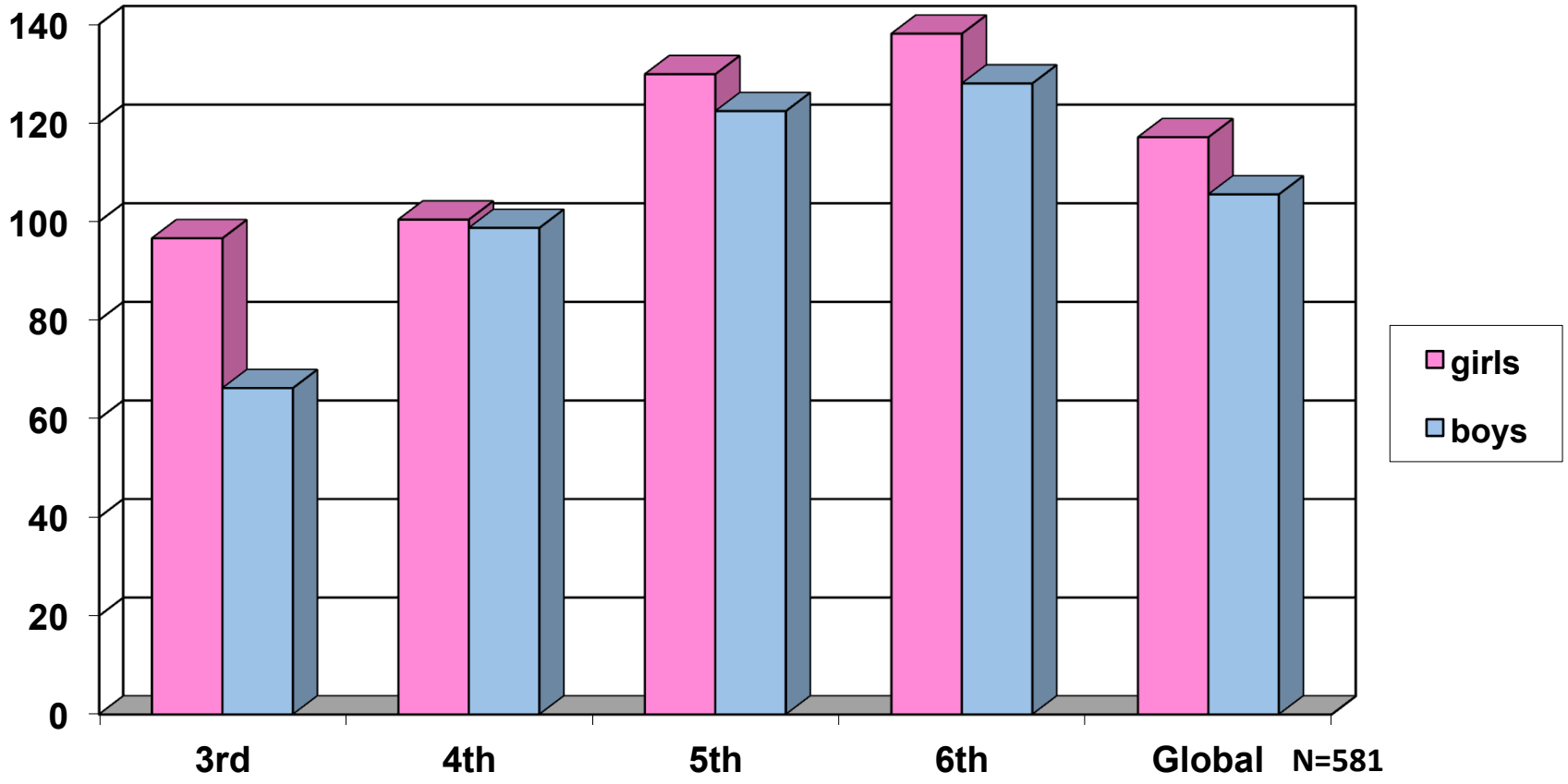
Gender G=girls B= boys



Text connecting< literal < gap filling

Gilrs>Boys

Differences by gender



F (2, 579)=7,366 p<0,001

Discussion

- Daneman 1988 and Perfetti 1994 propose lexical knowledge is related to reading ability in two different ways:
  - Richness
  - Speed of access
- Speed of access seems to be more important with our population: L2> L1>LD

Discussion

Present study

- Text connecting< literal < gap filling
- Fantasy narrative
- Less skilled readers poorer at all types of inferencing
- Poor comprehenders always the weakest
- Strategy choice might be playing a key role

Cain & Oakhill (1999)

- Gap-filling<literal<text-connecting
- Realistic narrative
- Less skilled readers poorer at all types of inferencing
- Poor comprehenders were weaker in gap-filling than the other groups
- Strategy choice might be playing a key role

Discussion

- Cain & Oakhill (1999) showed poor comprehenders improved their text-connecting inferences when they could look back at the text. In the present study, as in Yull & Oakhill (1988), even when the text present less-skilled comprehenders were poorer.
- Bower-Crane & Snowling (2005) have demonstrated that "*different reading tests tap different types of inferencing skills*"

Discussion

- Our findings suggest that gender differences are significant
- Our findings add to existant evidence that boys have more difficulties with reading comprehension (PISA, 2009, PIRLS, 2011)

Implications

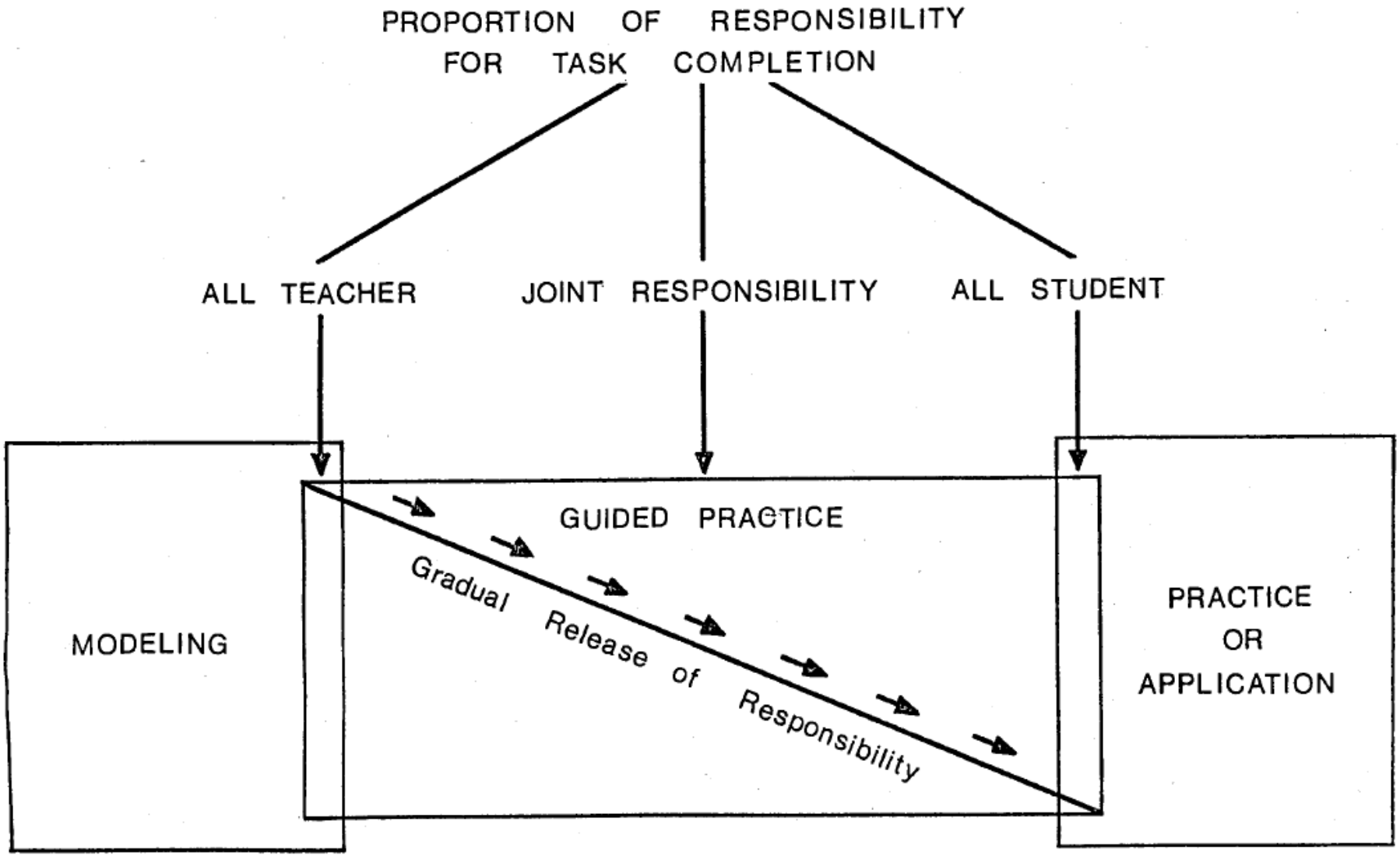
- Training
  - All types of inferencing: gap-filling, literal, text-connecting with different kind of narrative texts.
  - Systematic work to build lexical knowledge in L2 and LD children
- Research
  - Need more exploration of differences between girls and boys.

Implications

- Teach :
  - gap filling 1st,
  - literal 2nd,
  - text connecting 3rd
- Like Cain and Oakhill (1999), we observed difficulties in making inferences for LD. Training in making inferences could be helpfull for them.

Explicit teaching

- Explicit teaching of reading comprehension strategy : size effect = 1.18 (Bissonnette, Richard &Gauthier 2010) mega-analysis



Pearson et Gallagher (1983) The instruction or reading comprehension

Training inferences

- Mc Gee and Johnson (2003) did inference training by these steps:
  - Lexical training: explained meaning of specific words
  - Question generation: pupils generated their own questions from the text
  - Prediction : students guessed the missing segments by inference
- They conclude this is a ready-made inference training because they had a great succes (student 6-10 y improve over 17 months in Neale Analysis of reading Ability test)

Training inferences

- Elbro & Iversen (2013) trained 16 Grade 6 classes , 236 participants for 8 lessons of 30 minutes in text-filling, explicit teaching:
  - 1. pre-filled organizers
  - 2. when students familar, they filled in the box
  - 3. last 2 sessions, they read the text and answered inferences questions without the support of organizers
- They found: 1) they improved ability to make gap-filling inferences : effect size 0.92;
  - 2) Training was associated with a significant advance in reading comprehension

Conclusion

- Limitations:
  - few LD subjects
- Normal L1 > L2 > LD
  - The speed of access to vocabulary for LD and the lack of strategies could explain differences, as could the ability to use general knowledge to interpret a text
- Text connecting < Literal < Gap filling for all students
  - LD are poorer on all types

.

Give special attention to LD & L2 boys teach them inferencing and summarization strategies

THANKS FOR YOUR ATTENTION!

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