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Departamentos de Psicología Evolutiva y de la Educación

Morphosyntactic profiles of Spanish-speaking children with Down Syndrome in a sentence repetition task

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Introduction

Language development in people with Down syndrome (DS)

➡ **Characteristic feature of people with DS ➔ language problems**

➡ **AIM OF OUR RESEARCH GROUP ➔ study of language development in people with DS:**

- **Early lexical development**

- **Morphosyntactic development**

- **Relation between lexical and morphosyntactic developments**

Early lexical development

➡ **Trends of development : comprehension, oral-gestural production.**

➡ **Mechanisms in word acquisition (in progress):**

    - Joint Atention

    - Socio-pragmatic cues (Baldwin)

➡ Early lexical development → trends of development:

- **Productive vocabulary (oral modality): DS = TD**

- **Productive vocabulary (gestural modality): DS > TD**

- **Comprehension: DS > TD**
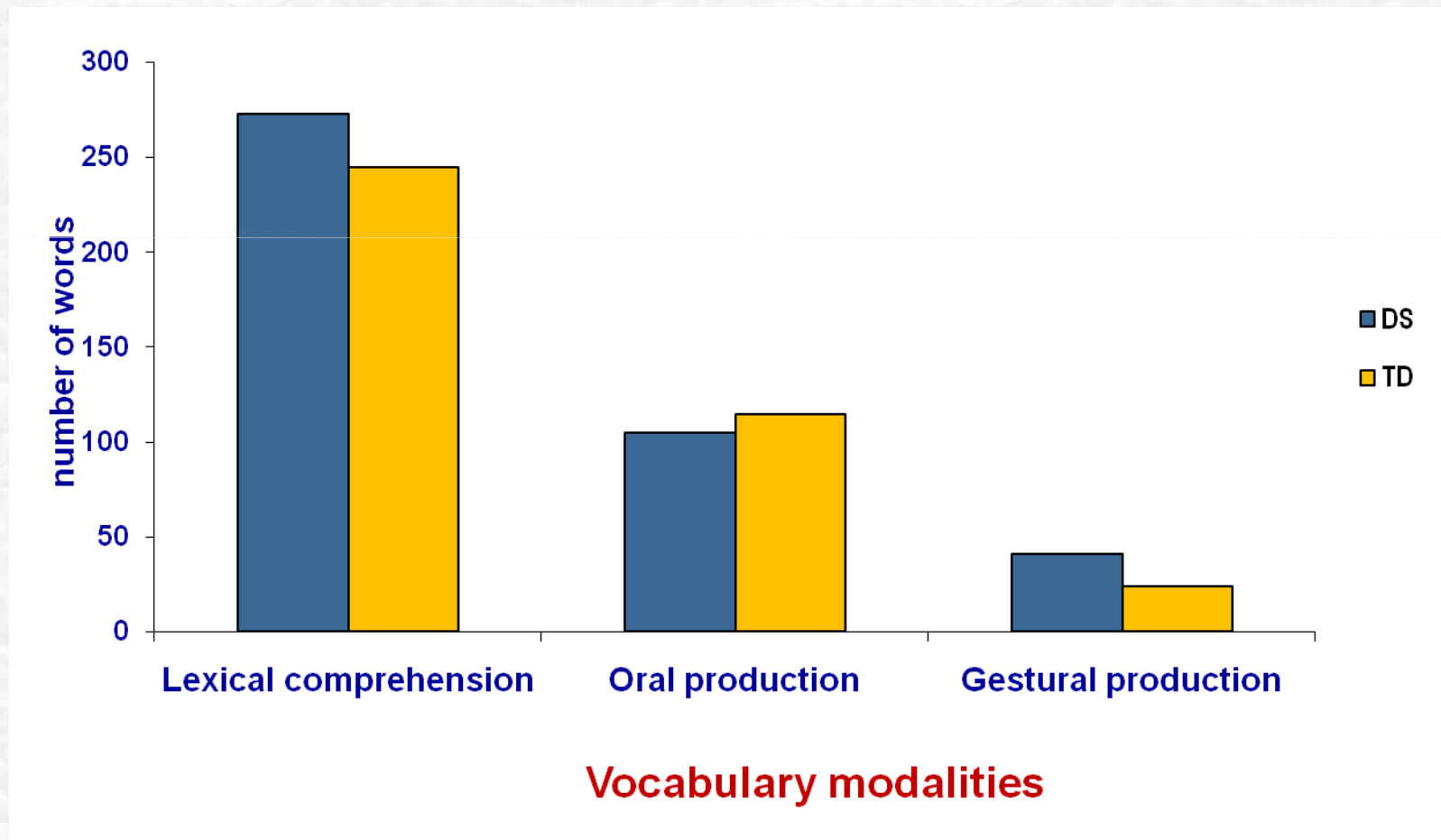
Morphosyntaxis

➡ **Morphosyntaxis → most affected areas**

- delay in the transition from 1 word to 2 words utterances

- shorter and less complex utterances in comparison with TD children

➡ **Acquisition of gramatical morphemes:**

- important difficulties with inflectional morphemes

- and in comprehension and production

Sudies on morphosyntactic development inDS show some problems

➡ **Participants → age of children and adults**

 ↳ **We need to know early stages.**

➡ **Number of participants → very small**

 ↳ **- Representative samples?**

  - Great variability in early stages of language development.

➡ **Most of the research → English speakers**

 ↳ **Data from other languages is needed.**

Aims of our research group

➡ **Study of morphosyntactic development from its beginning   (20 months of MA) to 6 years of MA.**

➡ **Early morphosyntactic development → 20 to 30 meses of MA (already published)**

   - 92 children with DS and 92 con TD individually matched on MA and gender

   - 80 children with con DS y 80 with TD matched on lexical development

   - Meausure → CDI-Down

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poorer morphosyntactic performance except in words combination

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they are able to combine them but in much simple constructions!!

Morphosyntax

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Difficult area in DS

Our research aims

AT THIS MOMENT

➡ **Study of morphosyntaxis from 30 months to 6 years of MA**

➡ **Measures**

- **Narration of story → narrations promote complex strutures production**

- **Setence repetition test → adapted from Devescovi & Caselli (2007)**

- **MacArthur-Bates adapted to language developmental profile of children with DS (CDI-Down).**

PRESENT COMUNICATION

➡ **Data from sentence repetition test**

➡ **Meausures**

- Total number of complete sentences produced and MLU-words

- Omissions (total and by words categories)

- Errors: agreement

NOTE:

❖ **Part of these data were presented at VII Congreso Internacional de Adquisición del Lenguaje (Bilbao, 2013).**

❖ **At the present communication we include analysis of:**

- **words types omissions**

- **agreement errors**

Method

Participants

MA	Condition	Girls	Boys	Total	MA Mean (range)	CA Mean (range)
Grup 1 (31-40 m)	DS	11	6	17	36,12 (31-40)	108,23 (43-197)
	TD	11	6	17	36,18 (31-40)	42,88 (39-47)
Grup 2 (41-60 m)	DS	8	9	17	53,00 (41-60)	125,76 (77-174)
	TD	8	9	17	53,06 (41-60)	52,65 (36-60)
Grup 3 (61-72 m)	DS	8	9	17	67,29 (61-72)	148,94 (110-226)
	TD	8	9	17	67,18 (61-72)	61,88 (52-79)
Total	DS	27	24	51	52,14 (31-72)	127,65 (43-226)
	TD	27	24	51	52,14 (31-72)	52,47 (39-79)

➡ **All children were matched on MA and gender**

➡ **Age limits ➜ arbitraries, but they show important changes:**

- 31-40 months: basic domain of syntax
- 41-60 months: more mature domain
- 61-72 months: more complex structures

Procedure

➡ **Individual tests in quiet contexts in schools**

➡ **Random sentences except the first 3 ones (shorter ones)**

Instruments

➡ **Sentences repetition test (Devescovi & Caselli, 2007).**

➡ **27 sentences with differents length and morphosyntactic complexity**

➡ **All sentences werer simple with 3-7 words**

➡ **Some examples:**

| TYPE OF SENTENCES	EXAMPLE
Simple sentences with copula	El coche es rojo the car is red
Simple sentences with one argument (singular)	El niño corre the child (masculin) runs
Simple sentences with one argument (plural)	Las niñas corren the children (feminine) run
Sentences with one argument and one modifier	El perro corre deprisa the dog runs fast
Simple sentences with two arguments and a simple preposition	El perro está en el jardín the dog is in the garden
Simple sentences with three arguments and a simple preposition	Lucas da la mano a María Lucas gives his hand to María
Simple sentences with three arguments and a simple preposition	Lucas lee el libro al niño Lucas reads the book to the child (masculine)

Results 1:

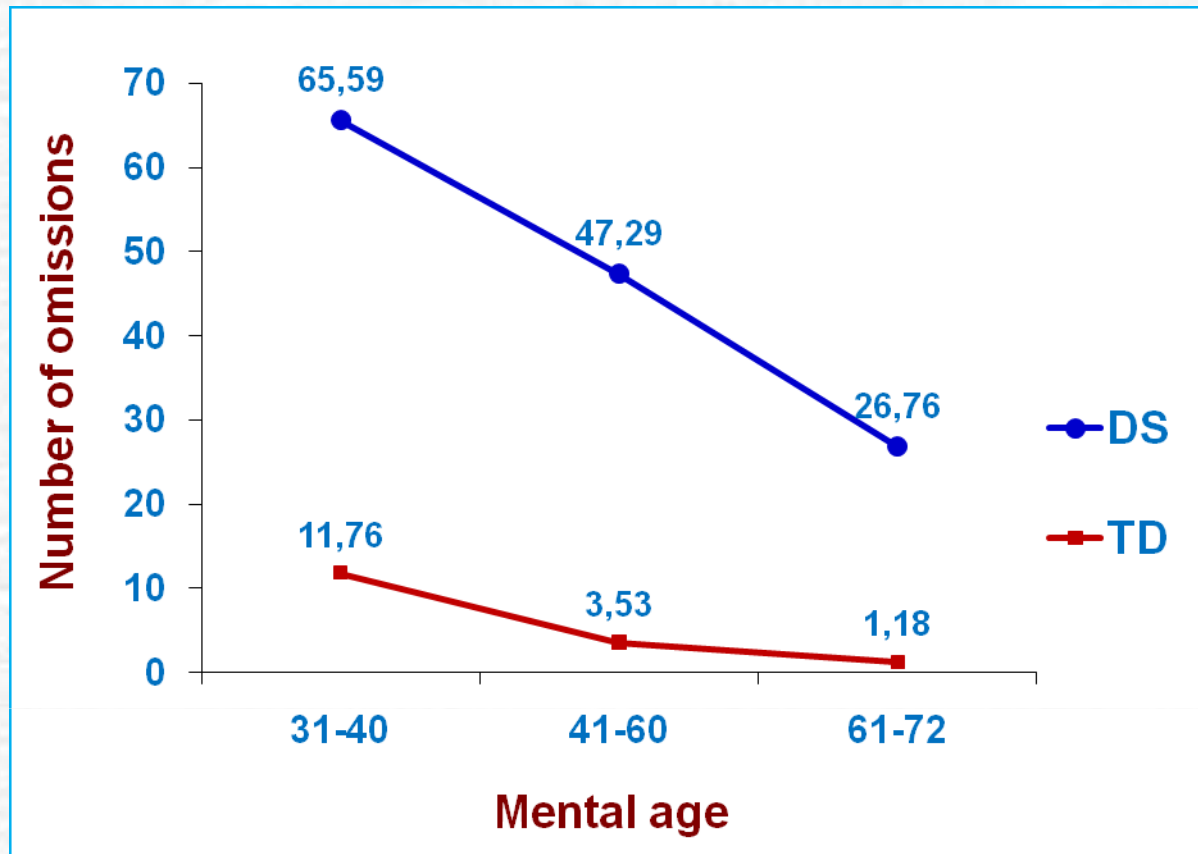- Number of total sentences produced

- MLU-words

- Number of omissions
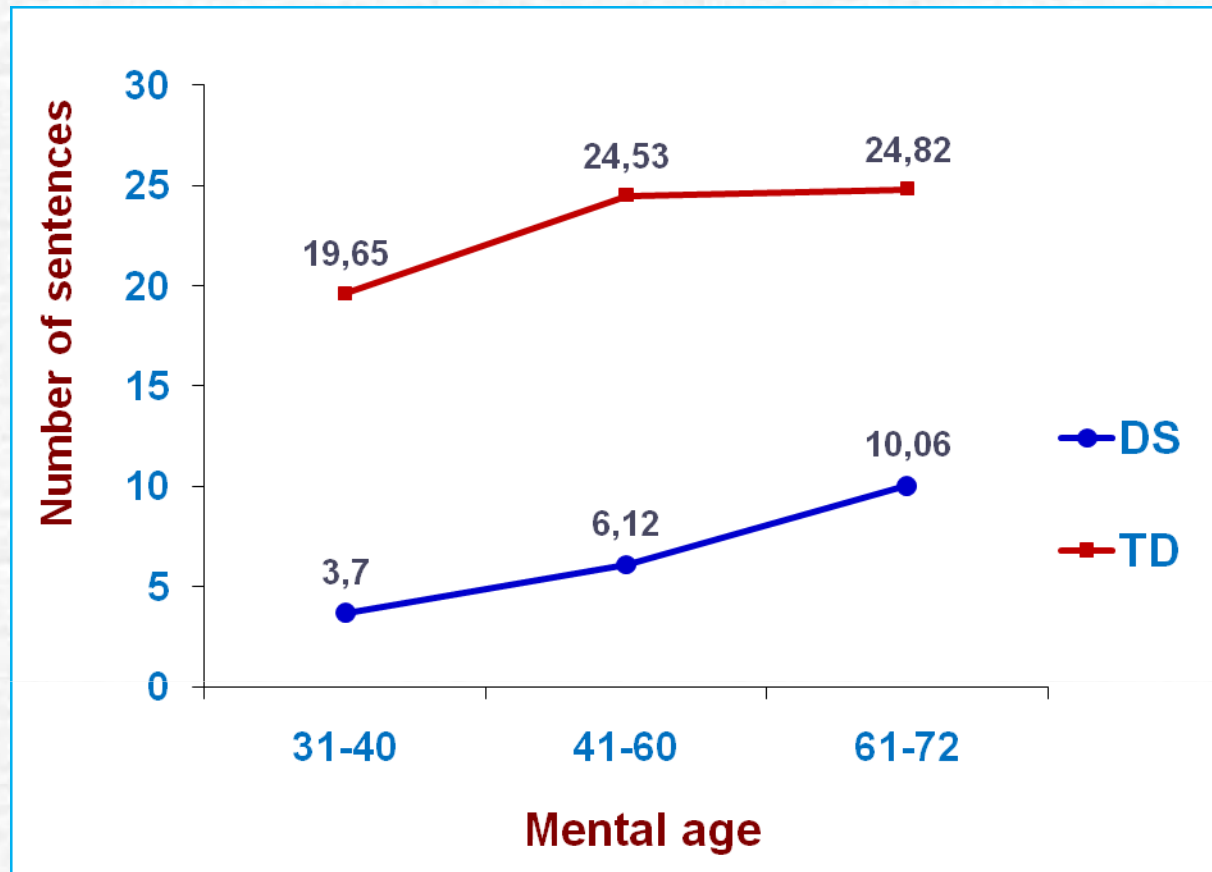
NUMBER OF COMPLETE SENTENCES (ANOVA)

➡ **Children with DS produce lower number of complex sentences**

➡ **No interaction → DS < TD in each age group**
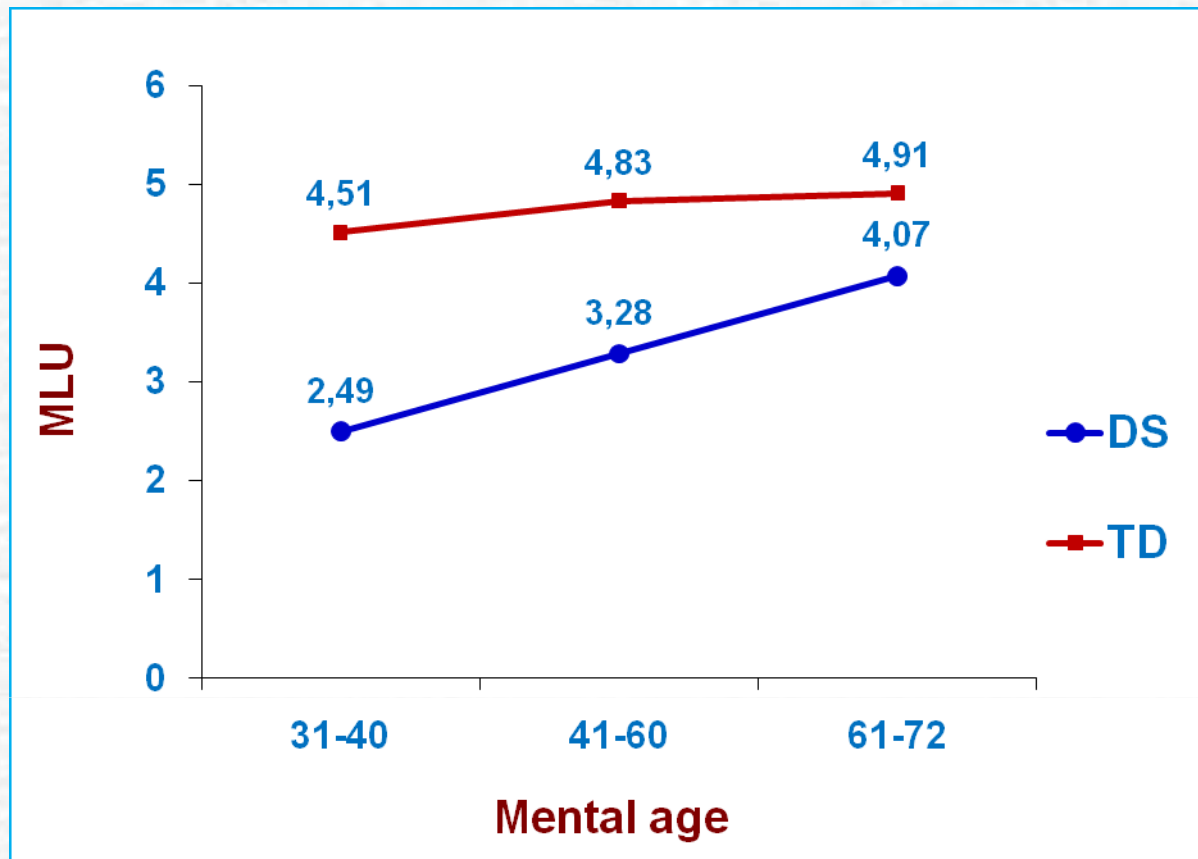
MLU (ANOVA)

➡ **Children with DS produce shorter sentences**

➡ **Interaction:**

- TD → no age differences
- DS → Group 1 < Group 2 < Group 3 → **They show progress**

TOTAL NUMBER OF OMISSIONS (ANOVA)

➡ **Children with DS present higher number of omissions**

➡**Interaction →**

  - TD → **no differences by age**

  - DS → **Group 1 > Group 2 > Group 3 → there is developmental progress!!**

Results 2:

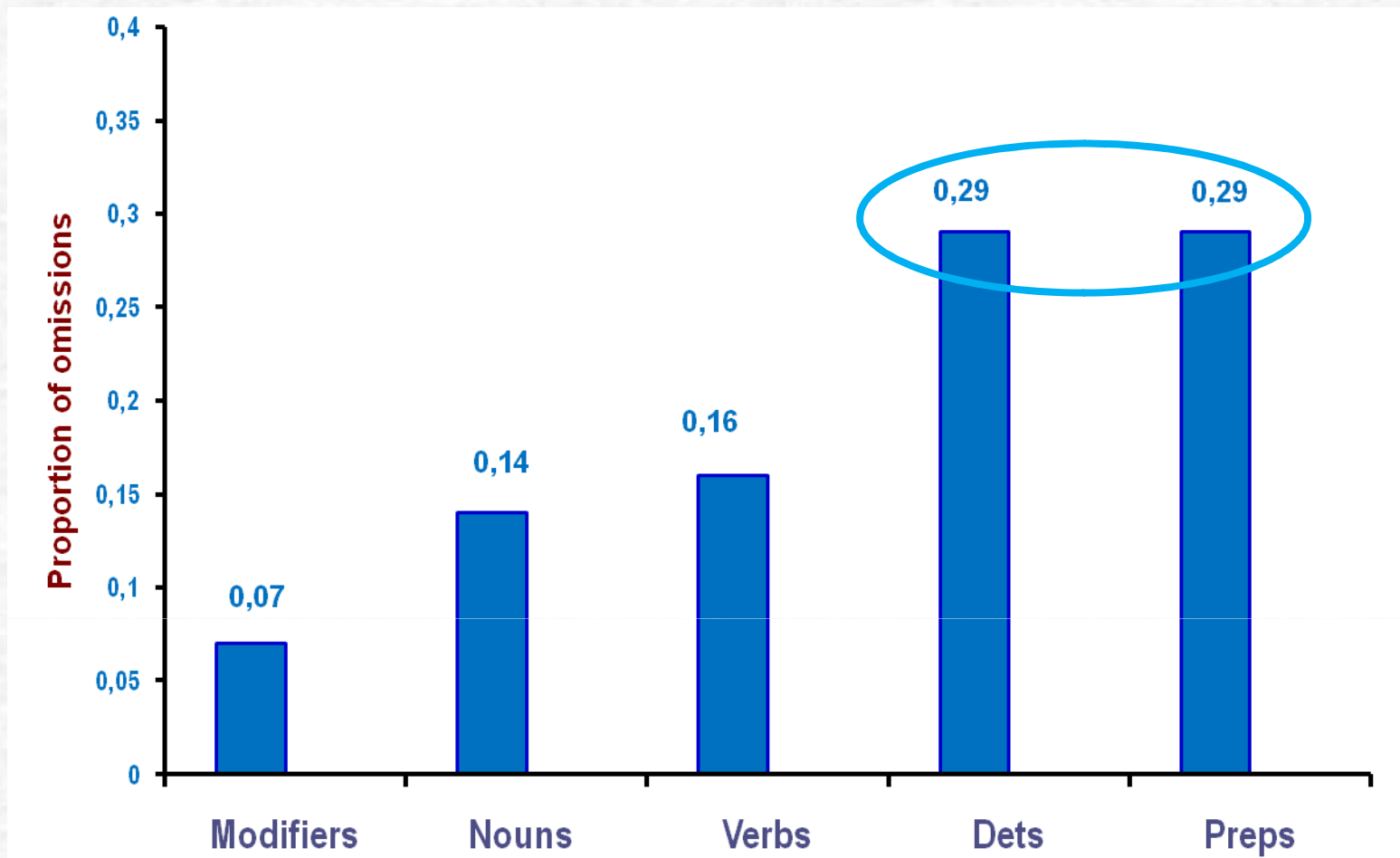Number of omissions as a function of classes of words

RESULTS

For Group, Age level, and Interaction → results are quite similar to those founded in omissions analysis:

- **Children with DS omit larger number of elements**

- **Interaction:**

  - **TD → no differences by age**
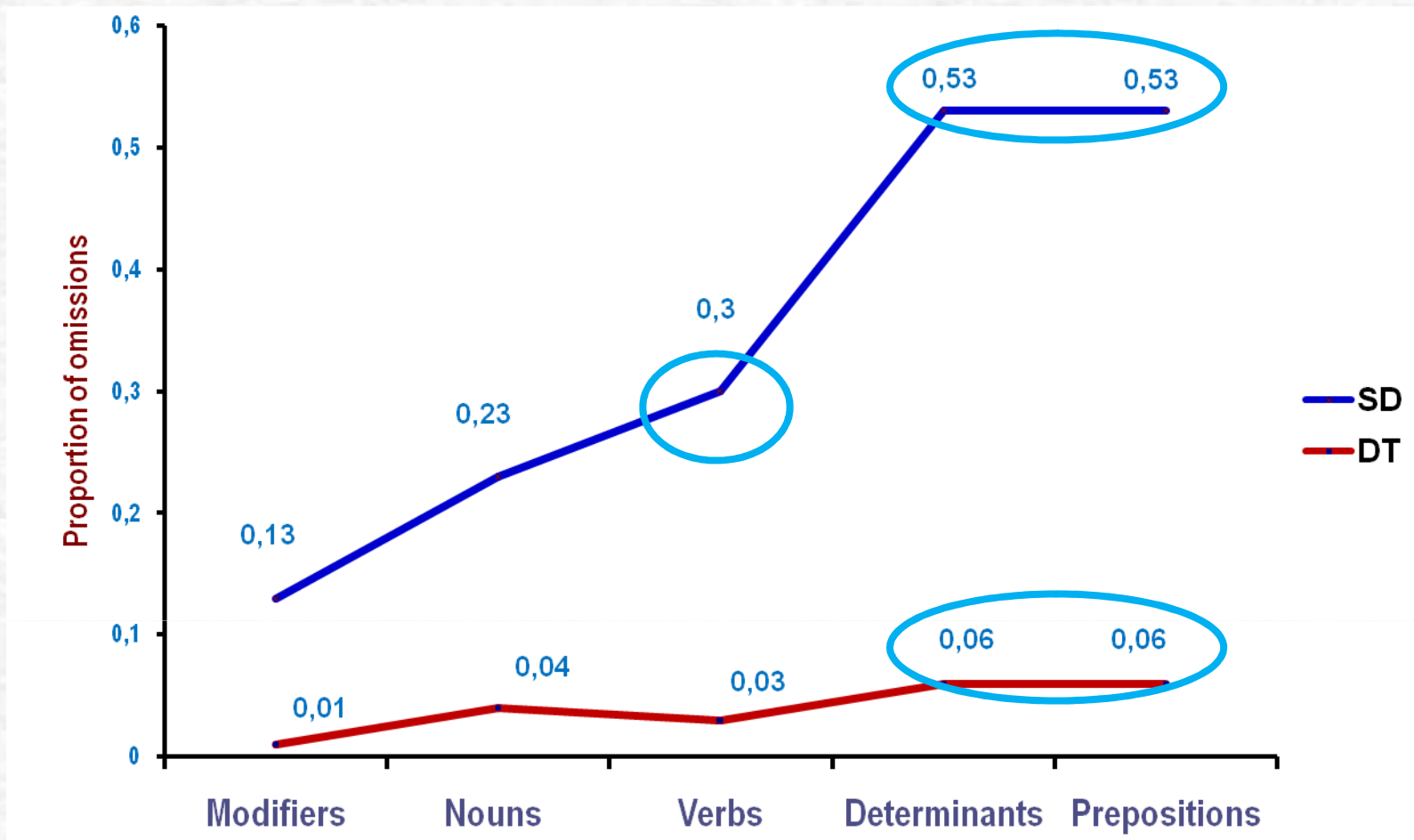
  - **DS → Group 1 = Group 2 > Group 3**

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We will center on word classes and their interactions

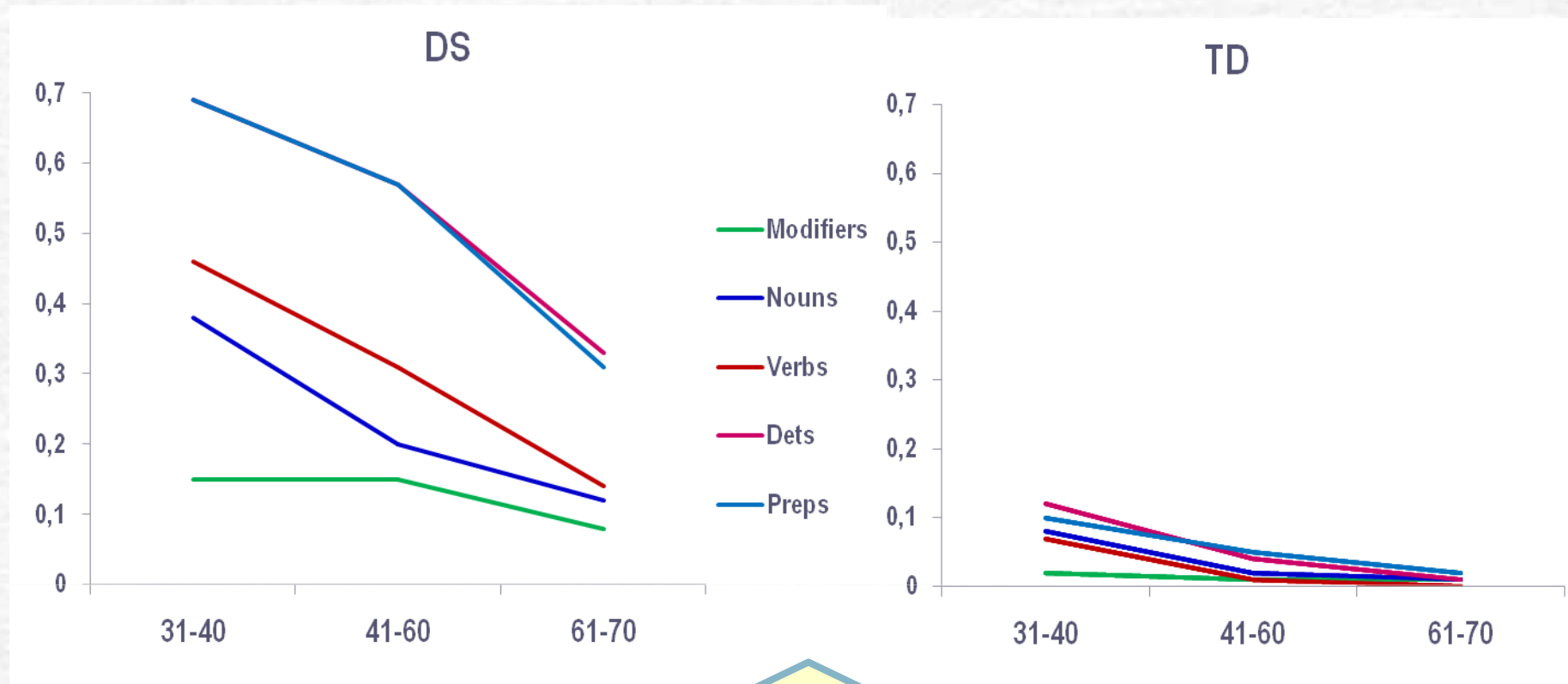Group x Classes of words (statistically significant)

➡ DS ➔ Modifiers < Nouns < Verbs < Dets = Preps

➡ TD ➔ no differences between classes
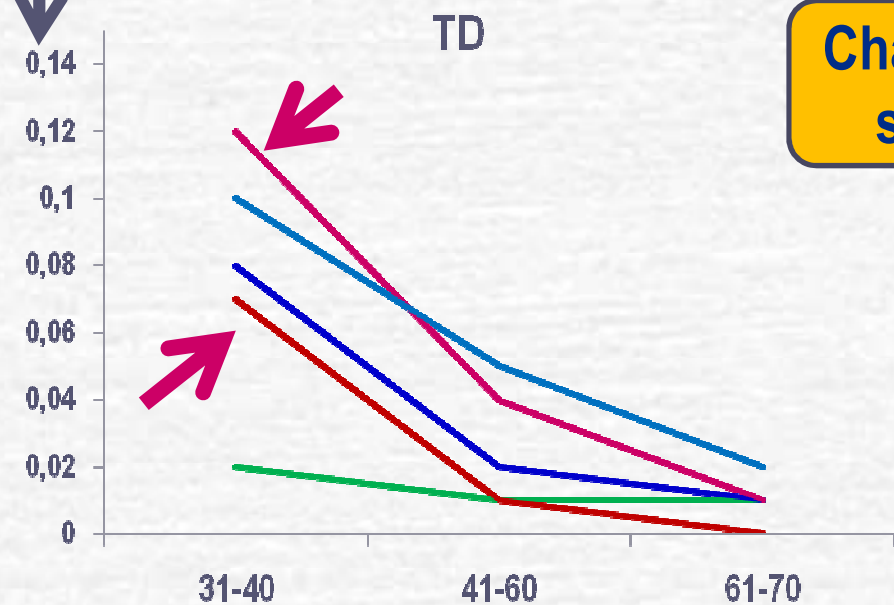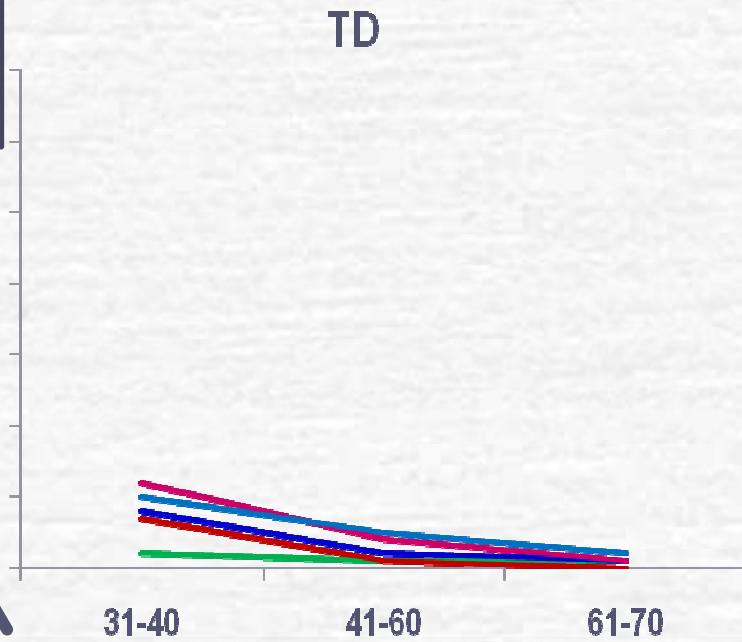
DS

TD

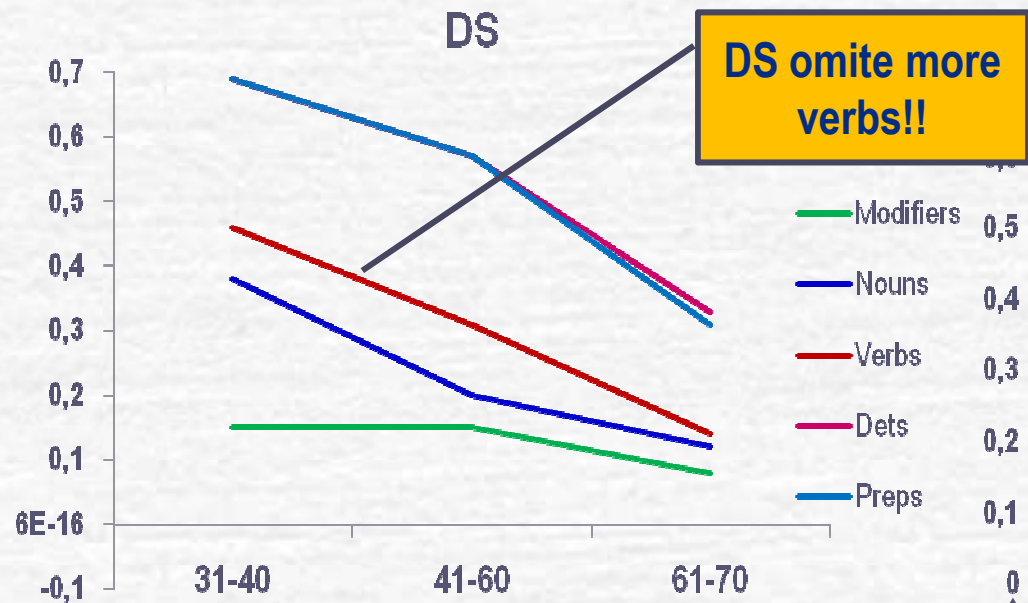Modifiers
Nouns
Verbs
Dets
Preps

Group x Age level x Classes of words (no significant)

➡ **DS → Progressive decrease in all classes of words except Modifiers**

➡ **More omitted classes of words: Dets + Preps**

➡ **TD → Few omissions in general, except in group 31-40.**

Results 3:

Number of omissions as a function of classes of words ONLY IN CHILDREN WITH DS
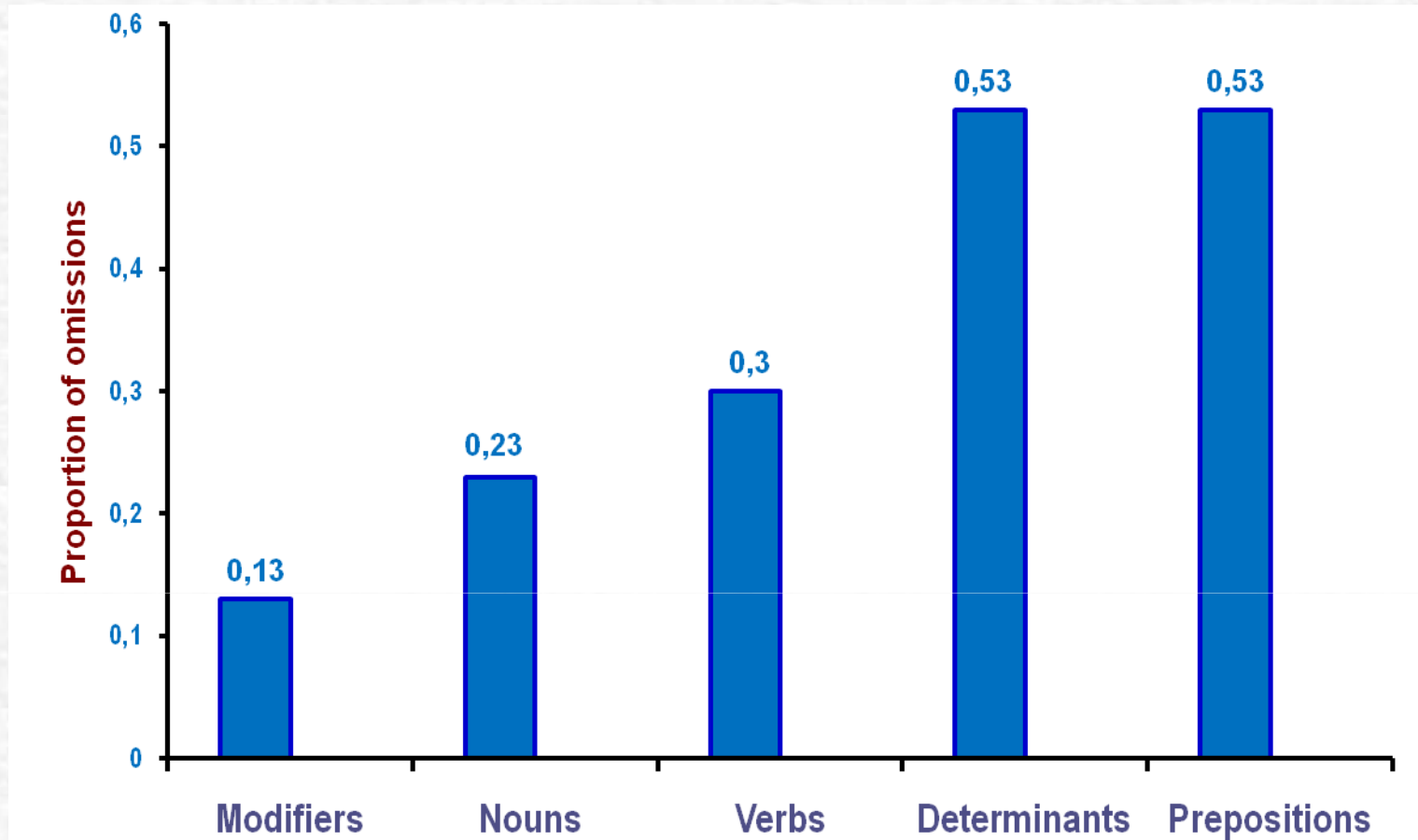
Previous analysis do not allow to know the developmental profile in each age level of children with DS, considering statistically significative differences

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ANOVA 3 (MA Levels) x 5 (Classes of Words) (= repeated measures)

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Again→ we will center on classes of words and their interactions
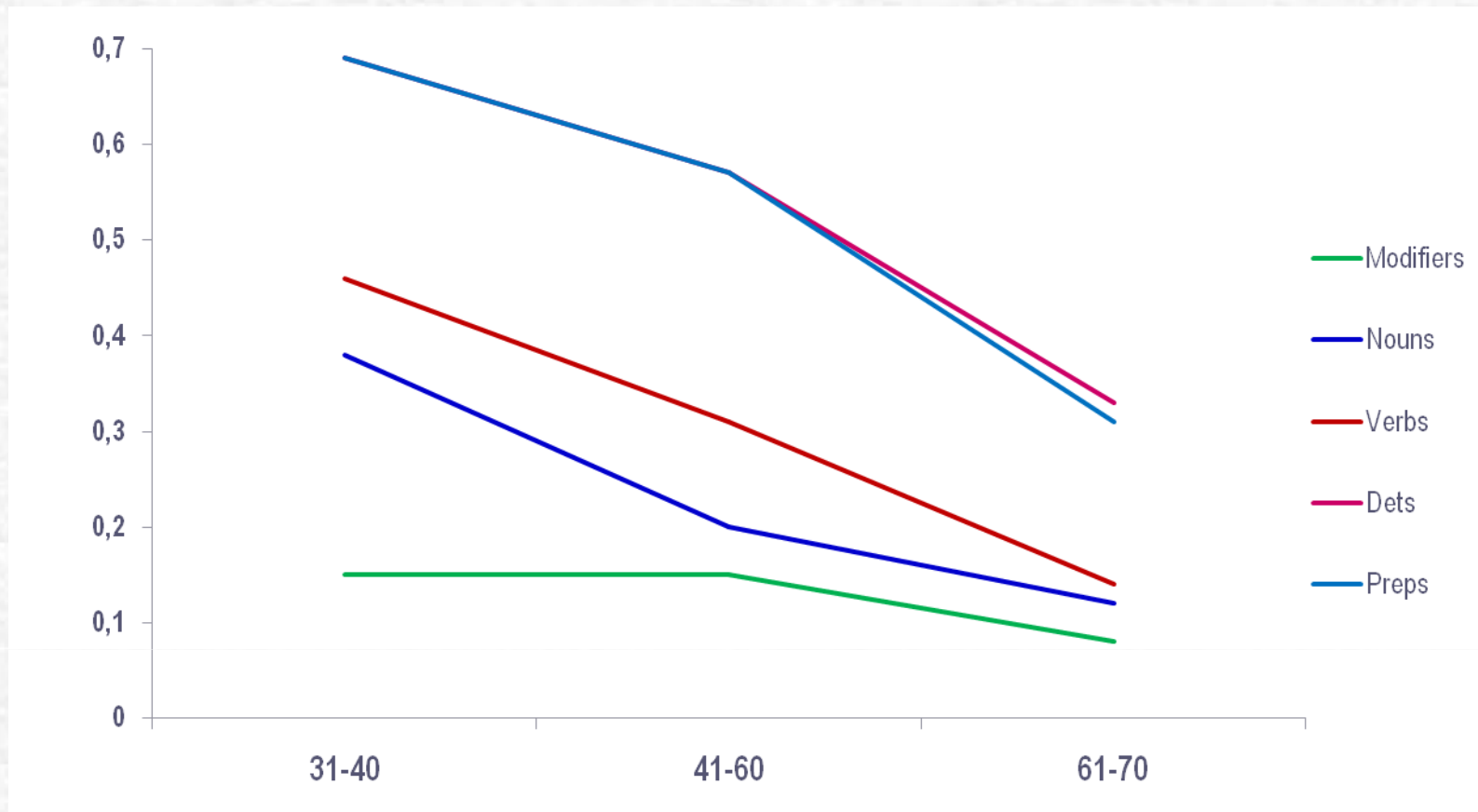
MA levels x Classes of words (statistically significant, partial $\eta^2 = 0,124$)

(Figure = previous figure, but with principal effect analysis)

➡ **31-40: Modifiers < Nouns = Verbs < Dets + Preps**

➡ **41-60: Modifiers = Nouns = Verbs < Dets + Preps (but Nouns < Verbs)**

➡ **61-72: Modifiers = Nouns = Verbs < Dets = Preps**

Results 4:

Analysis of agreement errors

MA Groups	DS	Type of errors	TD	Type of errors
Group 1 (31-40 m)	11	7 = number S/P (S-sing / V-plural or viceversa) 2 = number (Det-Noun) 1 = gender (Det-Noun) 1 = verb person (3ª → 2ª)	3	3 = number S/P (S-sing / V-plural or viceversa)
Group 2 (41-60 m)	11	9 = number S/P (S-sing / V-plural or viceversa) 1= number (Det-Noun) 1= gender (Det-Noun)	0	--
Group 3 (61-72 m)	21	17 = number S/P (S-sing / V-plural or viceversa) 3 = number (Det-Noun) 1 = gender (Det-Noun)	0	--
Total	43		3	

Greater number of errors for higher MLU

Important differences

Results 5:

Is the sentence repetition test a valid and reliable measure?

➡️ **Devescovi & Caselli (2007) found a high relationship statistically significant in children with TD (aged 2-4 years) between performance in sentences repetition test and spontaneous language examples.**

➡️ **Is it possible to generalize these results to people with DS?**

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Here are 3 extreme cases:

- **Child 1 ➔ MLU = 1, omissions = 105.**

- **Child 2: MLU = 1,89, omissions = 82.**

- **Child 3: MLU = 4,89, omissions = 5.**

➡️ **Orthographical transcription of 50 utterances-each child (if possible).**

➡️ **An utterance was defined as a sequence of words preceded or followed by silence (pause) or by a conversational turn.**

		Child 1	Child 2	Child 3
MLU	RT	1	1,89	4,89
	SL	1	1,72	3,94
Omissions	RT	105	82	5
	SL	A lot	10	9
Omissions / total words	RT	78,95 %	61,65 %	3,76 %
	SL	High	11,63 %	4,57 %

➡ **Classes of words omitted in SL → grammatical words (pronouns, determinants, auxiliaries, etc.).**

	Examples
Child 1	-Ahí → there - Papá → Daddy - tos → cough - este → this
Child 2	-Después (a) dormir → after this, (we are going to) sleep - el nene se cae → the child falls - no, ahí → No, there - (el) café → (the) coffee
Child 3	- La niña ha ido (a) pasear (con) la rana y el perro -que su padre (lo) quería destapar - y se lo ha hecho daño - un niño que estaba a (=en el) colegio

Discussion / conclusions

➡️**Children with DS:**

- **Poorer performance in all measures**

- **Developmental progress in all ages!!**

➡️**Children with TD** → **no age differences**

➡️**Explanation of results of children with TD:**

- **Extremely easy task** → **ceiling effect.**

- **Devescovi y Caselli (2007) noted that test is not sensitive from 3-4 years**

- **Children with DS** → **due to their problems with morphosyntaxis** → **test is sensitive to their progress:**

    Test seems useful for children and adolescents with DS

Highlight

➡ **Adolescents with DS do not reach test ceiling ➜ it is possible that some progress continue in later ages**

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Progress beyond adolescence WOULD NOT confirm critical period hypothesis

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Support to Chapman et al. data (1998) with children, adolescents, and adults

➡ **Important individual differences in children with DS**

↳ **Look for explanations of these differences ➜ theory and practice**

Classes of words

➡ **Greater omissions of Determiners and Prepositions → similar to data of language development in people with DS.**

➡ **Tendency to omit more verbs than nouns**

    Support to Galeote et al. (2007) data about a greater production of nouns in children with DS from 8 to 30 months of MA

➡ **Less omission of Modifiers → this class of word appeared at the end of sentences → better remembering.**

➡ **There are also important individual differences in children and adolescents with DS.**

Limitations

➡️ **n = significative, but there are still many children not evaluated (110)**

➡️ **Just sentences repetition test→ other type of tests are needed**

         results of the other meausures (narratives + CDI)

➡️ **Remain to be analyzed many cualitative and cuantitative aspects:**

  - **Stuttering and speech problems → load in memory (more time for production)**

  - **Unintelligebility**

  -**They refuse to repeat (=> they are aware of the difficulty)**

  - **Great gesture support**

  - **Some disruptive behaviors: precipitation, lack of attention, negation, etc.**

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