



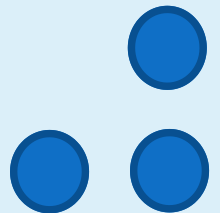
Cyprus
University of
Technology

Language based dysfluencies in narratives of Cypriot Greek children with Language Impairment

Elena Theodorou and Maria Constanta

Contact: eleni.theodorou@cut.ac.cy

1st International Composium in Motor Speech
Disorders, IALP
23-25 March 2018, Nicosia, Cyprus



Specific Language Impairment

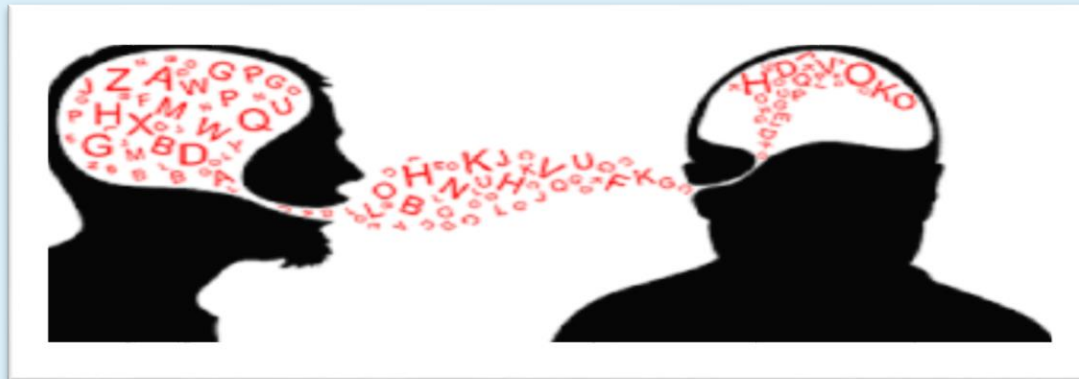
- SLI (recently Developmental Language Disorder, Bishop et al. 2016: CATALISE project) is the term applied to children who exhibit unexplained language problems but who have non-verbal intelligence in the broad range of normal (Bishop, 2014; Reilly et al., 2014)
- The heterogeneity of linguistic profiles is considerable (e.g. Rapin & Allen, 1988; Dale & Cole, 1991; Bishop, 2006)
- Prevalence of SLI → 7%, Boys > Girls (Tallal et al., 1989; Tomblin et al., 1997)
- Consequences: poor academic performance, poor peer interactions, behavior problems, emotional problems... (e.g. Catts, 1991; Clegg et al., 2005; Sices et al., 2007; Paul, 2007)
- Diagnosis based on inclusionary and exclusionary criteria as well as on clinical markers.

Cypriot-Greek

- Cypriot Greek is a variety of (Modern) Greek spoken natively on the island of Cyprus.
- There are substantial differences compared to Standard Modern Greek on all levels of linguistic analysis: phonetics, phonology, lexis, morphosyntax.
- Children are exposed to Standard Modern Greek from a very early age (media, cartoon, nursery schools...), whereas Cypriot Greek is used for everyday communication.
- Language status of Greek Cypriot children is described as bilectal. (Rowe & Grahmann, 2013)

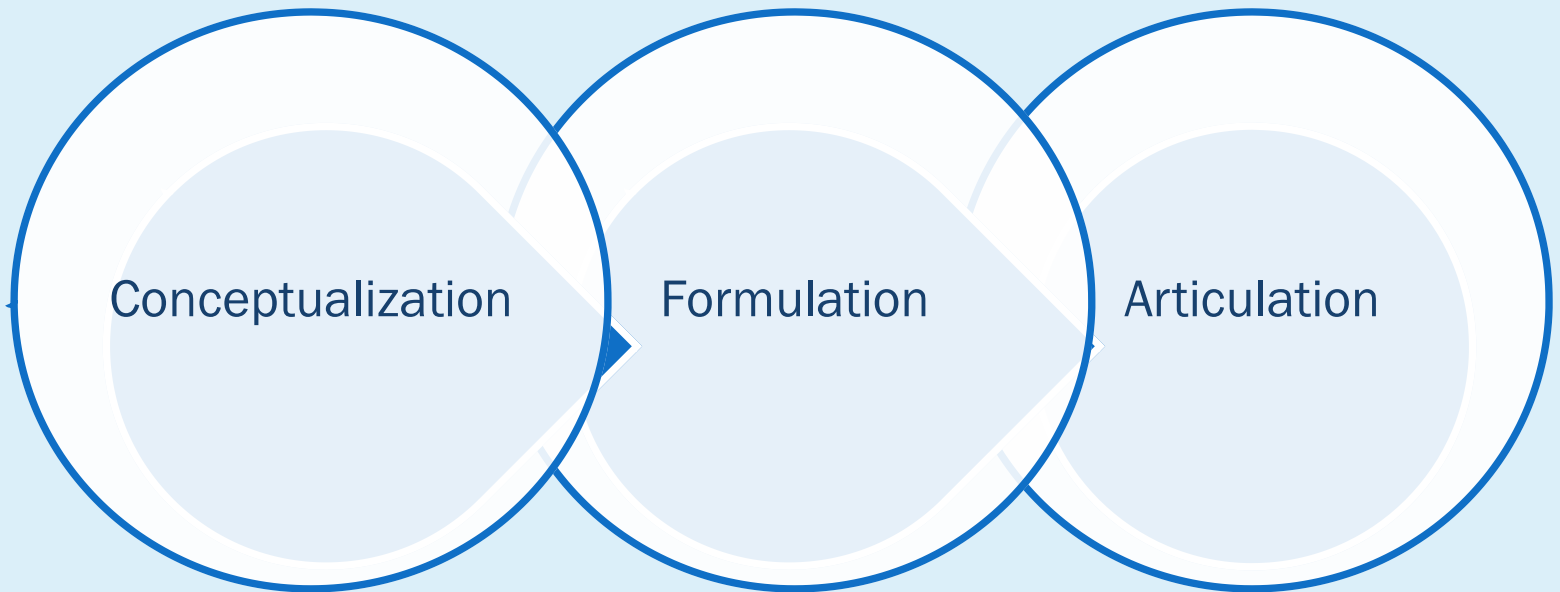
Fluency

- It is the effortless flow of speech, mentally and physically. (Starkweather, 1987)
- It is determined by the temporal control of speech production. (Starkweather, 1987)
- Fluency is the aspect of speech production that refers to continuity, smoothness, rate, and effort. (ASHA, 2003)



Fluency of speech

- Language production and language fluency are extremely intertwined linguistic processes. Spoken language production involves a number of discrete and concurrent stages. (Levelt, 1989)



Monitoring-Monitoring-Monitoring

Speech disfluencies

- Malfunctions in the encoding system may arise and manifest as disfluencies in the production of speech and language (Guo, Tomblin, & Samelson, 2008; Postma & Kolk, 1993).
- Disfluencies are the product of a monitoring mechanism with the following functions:
 1. *to control that a speaker's utterances are related to his/her previous intention;*
 2. *to control the context ambiguity of a message; and*
 3. *to control the establishment of phonemic and syntactic patterns.*

(Levelt ,1989; Fletcher.1990)

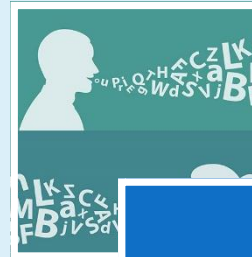
Speech disfluency

- disfluency is used to denote interruptions of speech that may be either normal or abnormal.



Linguistic disfluencies

- Hesitations
- Repetitions
- Revisions
- False starts
- Incomplete utterances
- etc



Stuttering

- Repetitions
- Prolongations
- Blocks

Linguistic disfluency

- Linguistic disfluencies seem to be quite natural elements of spontaneous speech.
- Number of disfluencies increases along the speaker's age and growing linguistic skills. (Starkweather, 1987; Fiestas et al., 2005).
- Disfluencies in spoken language may be used as strategies to “buy time” and repair error.
- Different types of disfluencies may reflect different types of processing breakdowns. (Boomer, 1965; Clark & Fox Tree, 2002; Goldman-Eisler, 1972; Levelt, 1989; Maclay & Osgood, 1959; Postma & Kolk, 1993).
- A correlation between fluency and verbal ability was supported. (Loban, 1976)

Disfluencies in children with SLI

- Linguistic disfluencies are regarded as one of the most important symptoms of language impairment. (e.g. Leadholm & Miller, 1995; Thordardottir & Weismer, 2002)
- Linguistic disfluencies occur oftener in speech samples of children with language impairment. (Boscolo et al., 2002; Guo et al., 2008)
- Children with SLI produce more content disfluencies like lexical and syntactic revisions (Thordardottir & Weismer, 2002), repetition of part of the word. (Nettelbladt & Hansson, 1999)

Disfluencies in children with SLI [2]

- Frequency and types of linguistic disfluencies can support the diagnostic process for those children who experience syntactic problems and word finding problems. (Leadholm & Miller, 1995)
- Linguistic disfluencies are found to be sensitive to the demands of the linguistic task especially for children with language impairment (e.g. ↑ narratives). (Nettelbladt & Hansson, 1999)

Aims

- To compare the amount of linguistic disfluencies which appear in a re-telling narrative between children with SLI and TLD children
- To examine whether qualitative differences appear between groups in terms of the type of linguistic disfluencies



Participants

Group	Age Range	Num. of Participants	Mean	Stand. Dev.	Gender
TLD-Y	4;5–6;6	10	5;8	0;6	6M, 4F
TLD-O	6;7–8;7	12	7;10	0;6	6M, 6F
SLI-Y	4;11–5;11	9	5;6	0;3	7M, 2F
SLI-O	6;7–8;1	7	7;8	0;8	3M, 4F

Diagnosis:

- Based on the clinical judgment of certified SLTs (case history, informal testing, analysis of language samples, observation, exclusionary criteria) (Leonard, 1998; DSM-IV, 2010)
- Performance on a full battery of language tests (DVIQ, BST, PPVT, Athina Test, Phonological Test, Expressive Vocabulary Test)
- Non-verbal intelligence within normal limits (>70) (Tomblin et al., 1997; Tomblin & Zhang, 1999) Raven's Coloured Progressive Matrices (Raven et al., 2000)

Materials

The Bus Story Test

- The language samples were collected using the Bus Story Test.
- The selection of this tool was done in order to analyze in detail the linguistic difficulties during the narrative speech.
- It is translated into Greek and used widely in Greece as a non-standardized measure.
- The Greek translation was employed (with minor changes in phonology and morphology adapted to Cypriot Greek), since children are used to hearing stories in Standard Modern Greek rather than Cypriot Greek from their pre-school years (Theodorou et al., 2016).

Procedure

- ① The examiner read the story showing the corresponding pictures.
- ② The child re-told the story.
- ③ The narrations were recorded using digital voice recording equipment.
- ④ Stories were transcribed and scored.



Classification of linguistic disfluencies (Balčiūnienė and Kornev, 2016)

■ Hesitations

- Unfilled pauses (e.g. Τότε (.) το (.) το λεωφορείο βρήκε ένα τρένο.)
- Filled pauses (e.g. [(.) uhh] έτρεξε για την πόλη.)

■ Repetitions

- Part of the word (e.g. Εκεί ειδ-(.) ειδ-(.) είδε μια λιμνούλα.)
- Word (e.g. Και (.) μετά επειδή εβαρέθηκε να βουρά περπατά μες μες το δρόμο.)
- Phrase (e.g. Και έτρεχε και δεν ήθελε δεν ήθελε να μπει το (.) και έφυγε μακριά.)
- String of words (e.g. Μια φορά και ένα καιρό ήταν ε-(.) ένα άτακτο λεωφορείο που όταν ο οδηγός του προσπαθούσε να το σάσει το λεωφορείο να το (.) σάσει (.) το λεωφορείο (.) αυτό το έσκασε.)

Classification of linguistic disfluencies (Balčiūnienė and Kornev, 2016)

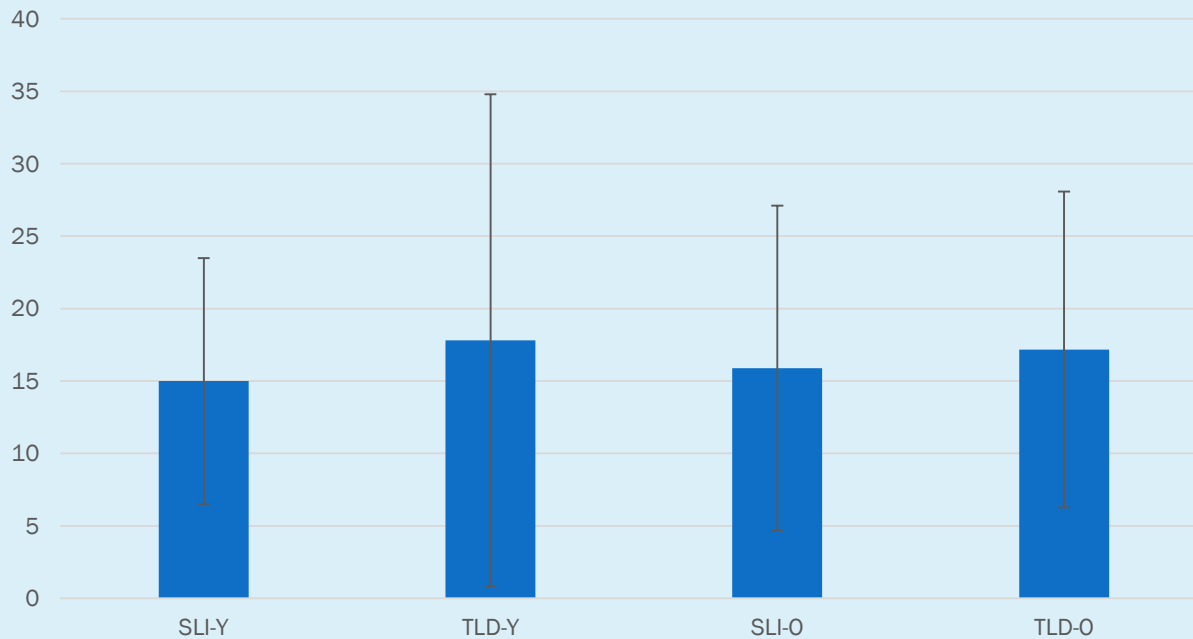
- **Revisions**

- **Grammatical** (e.g. Ύστερα (.) το λεωφορείο πήγε σε στην πόλη (.)*)*
- **Lexical** (e.g. Και (.) ύστερα έφυγε το φορτηγό το λεωφορείο.)
- **Phonological** (e.g. Και το λεωφ-(.) και το λεωφο-(.) και το λεωφορείο κατέβαινε το λόφο.)

- **False starts** (e.g. ~~Και σαν τα βουρούσε~~ (...). Και οι άνθρωποι ήταν μέσα στη μέση του δρόμου.)

- **Incomplete utterances** (e.g. Είχε ένα οδηγό που προσπαθούσε να το -(.))

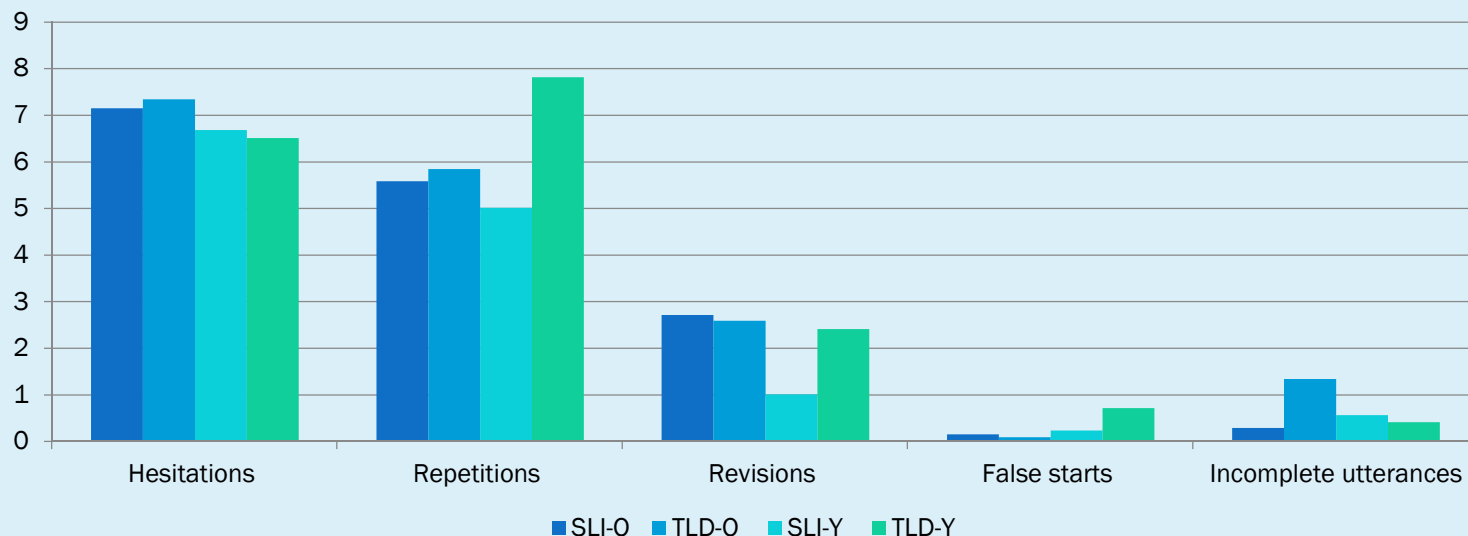
Results: Total disfluencies in TLD-Y and SLI-Y



SLI-Y and TLD-Y
 $p=0,65$

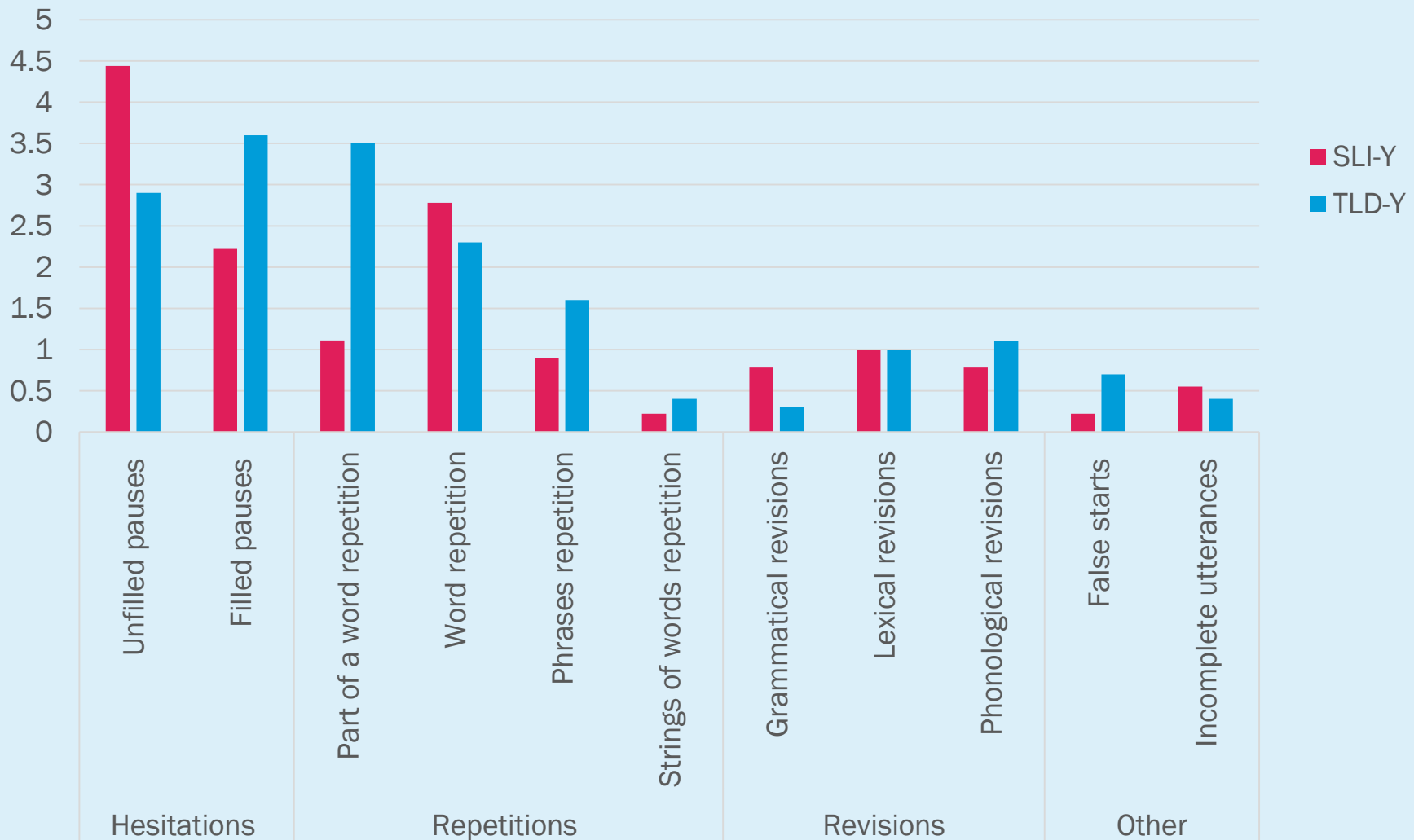
SLI-O and TLD-O
 $p= 0,81$

Results: Types of linguistic disfluencies in TLD-Y and SLI-Y



	SLI-Y	TLD-Y	Sig (2-tailed)	SLI-O	TLD-O	Sig (2-tailed)
Hesitations	6,67 (5,09)	6,5 (10,36)	0,96	7,14 (4,1)	7,33 (4,99)	0,93
Repetitions	5 (4,24)	7,8 (5,22)	0,2	5,57 (6,75)	5,83 (5,22)	0,93
Revisions	1 (0)	2,4 (2,06)	0,06	2,7 (2,29)	2,58 (3,65)	0,92
False starts	0,22 (0,66)	0,7 (1,52)	0,53	0,14 (0,37)	0,08 (0,28)	0,73
Incomplete utter.	0,55 (0,53)	0,4 (0,47)	0,52	0,28 (0,75)	1,33 (1,67)	0,08

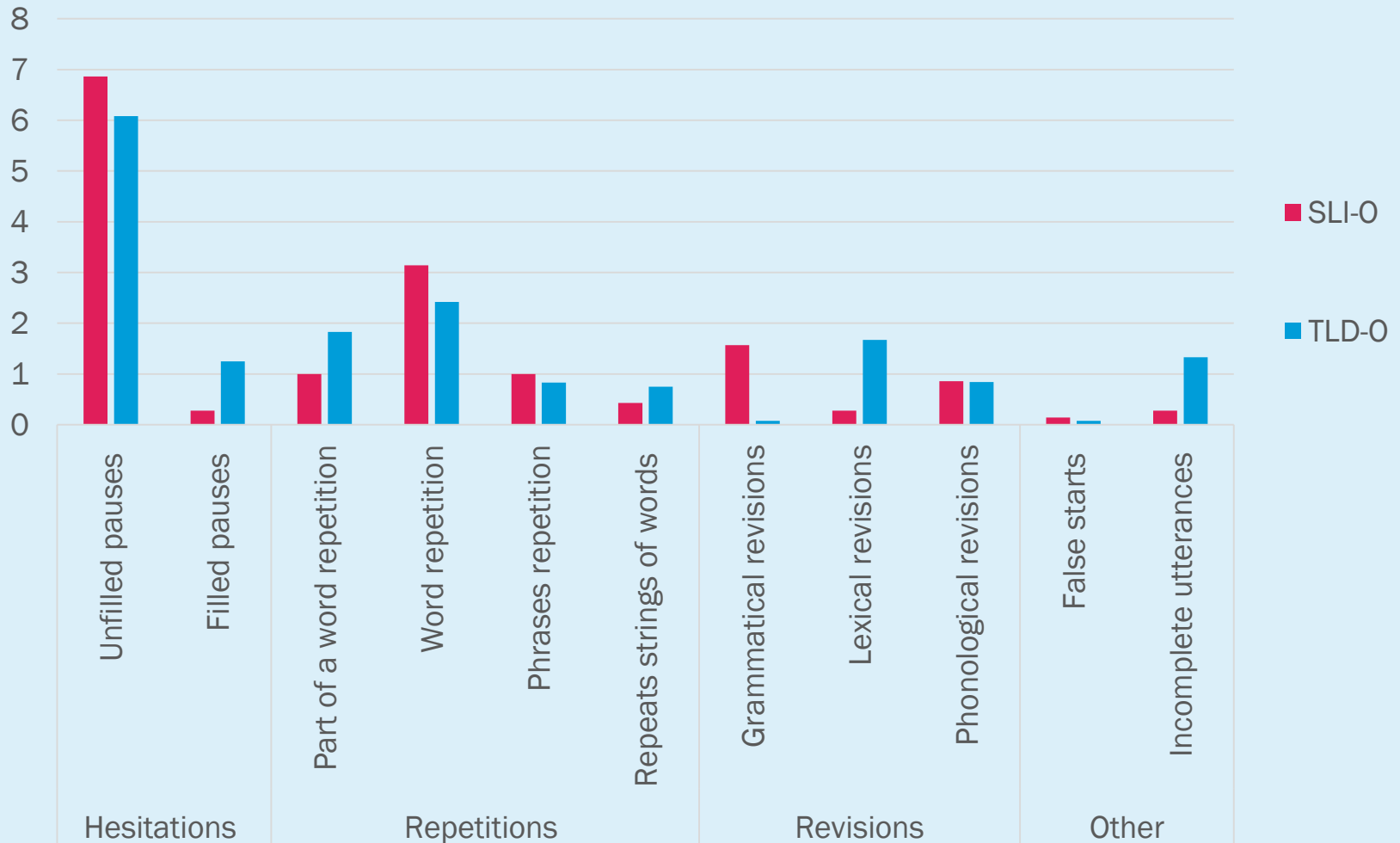
Results: Types of linguistic disfluencies in TLD-Y and SLI-Y [2]



Results: Types of linguistic disfluencies in TLD-Y and SLI-Y [3]

	SLI-Y		TLD-Y		Sig (2-tailed)
	M	SD	M	SD	
Unfilled Pauses	4,44	4,36	2,9	4,34	0,22
Filled pauses	2,22	2,49	3,6	6,72	0,28
Repetition- part of the word	1,11	0,79	3,5	3,63	0,035*
Repetition-word	3,89	4,01	4,3	2,45	0,40
Grammatical revision	0,78	1,3	0,3	0,48	0,16
Lexical revision	1	1,5	1	1,33	0,5
Phonological revision	0,78	1,3	1,1	1,91	0,33
False starts	0,22	0,67	0,7	2,21	0,26
Incomplete utterances	0,55	0,53	0,4	0,52	0,26

Results: Types of linguistic disfluencies in TLD-Y and SLI-Y [4]



Results: Types of linguistic disfluencies in TLD-Y and SLI-Y [5]

	SLI-O		TLD-O		Sig (2-tailed)
	M	SD	M	SD	
Unfilled Pauses	6,86	4,14	6,08	4,34	0,35
Filled pauses	0,28	0,49	1,25	1,48	0,03*
Repetition- part of the word	1	1,41	1,83	2,37	0,17
Repetition-word	4,57	5,50	4	3,88	0,41
Grammatical revision	1,57	1,51	0,08	0,29	0,02*
Lexical revision	0,28	0,49	1,67	2,35	0,03*
Phonological revision	0,86	0,9	0,83	1,58	0,48
False starts	0,14	0,38	0,08	0,29	0,36
Incomplete utterances	0,28	0,75	1,33	1,67	0,04*

Discussion

- CG speaking children with SLI were found to produce the same amount of linguistic disfluencies as TLD children did.
- Analysis of linguistic disfluencies can support the identification clinical procedure for children with SLI.
- The number of Linguistic disfluencies in a re-telling task cannot be a clinical symptom for CG children with SLI.

Future plans

- To examine the number of disfluency per utterance
- To examine other type of disfluencies (e.g. empty starts: και μετά...)
- To examine linguistic disfluencies in spontaneous language sample
- To examine the relation of the amount of linguistic disfluencies with the language complexity
- To examine the relation of the amount of linguistic disfluencies with the speech rate



Selected references

- Balčiūnienė, I., & Kornev, A. N. (2016), Linguistic Disfluency in Children Discourse: Language Limitations or Executive Strategy? In *Computational Linguistics and Intellectual Technologies: Proceedings of the International Conference "Dialogue 2016."* Moscow.
- Clark HH, Fox Tree J. (2002), Using uh and um in spontaneous speaking. *Cognition*, 84:73–111. [PubMed: 12062148]
- Fiestas, C. E., Bedore, L. M., Peña, E. D., & Nagy, V. J. (2005), Use of Mazes in the Narrative Language Samples of Bilingual and Monolingual 4- to 7-year old Children. *Proceedings of the 4th International Symposium on Bilingualism*, 730–740.
- Levelt, W. (1989), *Speaking: From intention to articulation*. Cambridge, MA: MIT Press.
- Ling-yu Guo, J. Bruce Tomblin, & Samelson, V. (2008). Speech Disruptions in the Narratives of English-Speaking Children With Specific Language Impairment. *Journal of Speech, Language and Hearing Research*, 51(3), 722–738.
- Theodorou, E., Kambanaros, M., & Grohmann. (2016). Diagnosing bilingual children with SLI: Determination of identification accuracy. *Clinical Linguistics & Phonetics*, (June).
- Thordardottir ET, Ellis Weismer S. (2002). Content mazes and filled pauses in narrative language samples of children with specific language impairment. *Brain and Cognition*; 43(2–3):587–592.

**Thank you for your
attention!**

Any questions???