Cognitive disorders as sources of variation in dialogues

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Cognitive disorders as sources of variation in dialogues

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INTRODUCTION

Multiple Sclerosis (MS)

• Neurodegenerative disorder including physiological, motor, cognitive and psychological impairments [1]

Cognitive impairment (CI) in up to 65% patients with MS : deficits in planning and decision making, working memory, attention and speed of processing [2]

• Read speech and CI :
 - Articulation rate slower with low working memory capacity and slower processing speed [3, 4]

 -Planning strategy -> longer time needed to plan the upcoming speech material

Comparison of healthy vs MS populations to get insight into cognitive constraints on speech planning

Interpersonal coordination

• Turn-taking is quick, but latencies in planning language production are longer [5]

• Question–answer (Q-A) pairs interesting for turn-taking coordination, because questions make a floor transfer relevant [6]

• Prosodic adaptation: similar prosodic patterns [7]

Research questions

(1) Is turn-taking timing differently adjusted in MS patients with/without cognitive deficits?

(2) Is prosodic adaptation related to cognitive deficits in MS?

PARTICIPANTS

|	MS-CI*	MS-NCI*	Controls (C)**	Interlocutors (I)***
N	6	6	12	12
Age	50.6 (6.3)	44 (11.4)	36.9 (16.1)	23.4 (3.4)
Gender	5F/1M	5F/1M	10F/2M	10F/2M
EDSS	5 (1.18)	3.2 (1.25)	--	--

*Relapsing remitting form; Exclusion criteria: therapy with antidepressant; dyslexia; dysarthria; history of alcohol or drug abuse; history of psychiatric disorder; hearing disorders; ** Matched in gender and education level with MS; *** Speech therapists or neuropsychologists;
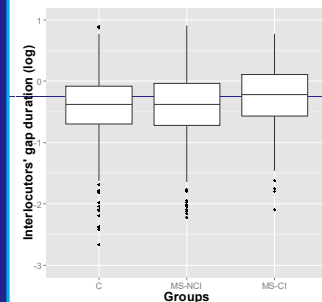
Neurocognitive scores
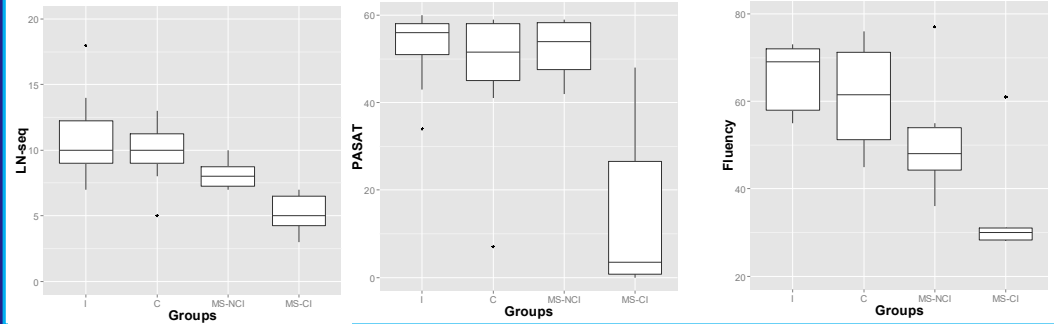
RESULTS & DISCUSSION
Speakers' Gaps
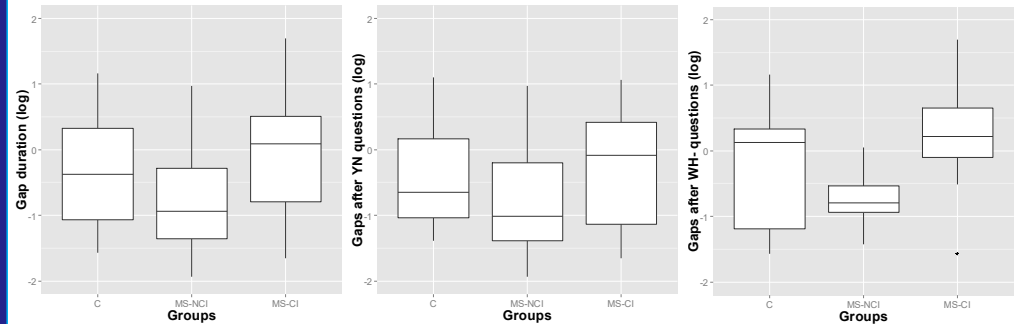
Interlocutors' adaptation

• Strategies in interpersonal coordination depend on cognitive abilities: MS-CI vs. MS-NCI [β = 0.85, SD = 0.23, t= 3.6]; MS-NCI = C

• Longer gaps in Q-A -> more time preparation for MS-CI

•Wh-questions slower than polar questions -> greater cognitive complexity of response involved [9]

• Interlocutors adapt their gaps to MS-CI [β = 0.38, SD = 0.13 t = 2.8]

METHODS

Neurocognitive tests [3,4]
•Working memory : Letters and number sequencing task; SDMT
• Speed of processing : PASAT-3s
• Phonemic and Sematic fluency tests

Extreme group approach: MS-CI vs. MS-NCI [4]

Linguistic task

• Shipwreck scenario game [8]
• Dyads : MS vs. C / C vs. I (see table)
• Labeling of Interpausal Units and gaps in Q-A pairs (PRAAT)
• Adaptation by interlocutors
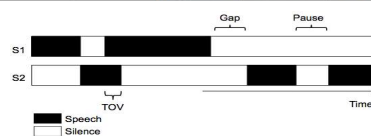
Statistics: Mixed models (p < .05)

CONCLUSION

• Cognitive constraints as source of variability in dialogues -> speech planning as flexible? [10]
• Speech-based technologies to complement CI screening and monitoring + training therapists
• Future work: finer-grained analysis of different question types.

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