

Linguistic and biomechanical adaptations in interpreters: analysis of expert and beginner sign language interpreters

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Introduction

The fast and repeated movements of hands and arms involved in the production of sign languages in performing situation contribute to the emergence and development of upper limb pain (De Caro, Feuerstein and Hurwitz, 1992; Feuerstein and Fitzgerald, 1992; Scheuerle, Guilford and Habal, 2000; Sweeney, Petersen and O'Neill, 1995).

Studies show evidences of the *multifactorial* nature of musculoskeletal disorders. Thus interdisciplinary analysis and interventions are needed to prevent and counter them.

It is interesting to consider that those disorders may be related to linguistic factors, such as articulator features (e.g. reaching the location) and cognitive factors (e.g. establishment of reference).

This study analyses the linguistic aspects that affect the articulation economy among French/Quebec Sign Language (LSQ) interpreters.

We will focus on the following aspects:

- **Temporal and biomechanical**
- **Linguistics (phonological and morphosyntactic)**

Given that:

... risk factors described by the researchers

Risk and prevention factors for interpreters in sign language (Villeneuve, 2006)

	Risk	Prevention
Biomechanical	Repetitive movements	Breaks (complete and micro-breaks)
	Speed of work and charges	Reduction of the space envelope
	Extreme articulation zones	Posture variation
	Static posture during work	Drinking water during work time
	Length and intensity of the work	Physical preparation: sleep, preactivity and postactivity exercises
	Gestual precision, speed and acceleration	Clap hands together in cold weather
Cognitive	Complexity of the message	Linguistic preparation
	Structural distance between L1 and L2	Automatisme
	Speaker voicing speed	Visual support
	Intense concentration	
Psychosocial	Difficulty in interpersonal relations	Management of personal relations
	Performance (anxiety)	Stress management
	Emotional content	Debriefing
	Fear of pain	Psychological preparation
	Organisation: schedule transport, winter road conditions, emergencies, etc.	Organisation: team work, balanced schedule, supervision and work framing, etc.

... linguistic modifications for articulatory economy are frequent in speech context and they are normal for native signers (Bouchard et al., 1999).

- ✓ Sign order (Parisot, 2003);
- ✓ Parallel encoding (Miller & Dubuisson, 1992);
- ✓ Handshape assimilation (Miller, 2000; Parisot 2003);
- ✓ Change of location (Lavoie & Villeneuve, 1999; 2000).

I ask the following question:

Is there a difference between expert and beginner interpreters production ?

I analysed economic strategies in interpreters productions from temporal, biomechanical and LINGUISTICS points of view.

Participants and task

PARTICIPANTS	EXPERIENCE (YEARS)	MOMENT OF LEARNING LSQ	TRAINING
E1	15	adult	no
E2	16	adult	yes
E4	17	adult	no
E6	12	adult	yes
E7	24	adult	yes
D1	1,75	adult	no
D2	2,5	adult	yes
D3	2	adult	no
D4	1,5	adult	yes
D5	2	adult	yes

Participants

- ✓ Experts minimum 10 years of experience (n=5)
- ✓ Beginners 1,5 years expérience (n=5)
- ✓ No injured interpreters

Task

- ✓ 2 interpretations of 20 minutes (French to LSQ)
- ✓ 2 different levels : family and scientific levels
- ✓ Face of a Deaf person

Analyse tool: Elan

- ✓ Transcription and analyse system
- ✓ Allow millisecond mesures - precision
- ✓ Data – researcher decides of categories

H1: Experts will have longer lag time



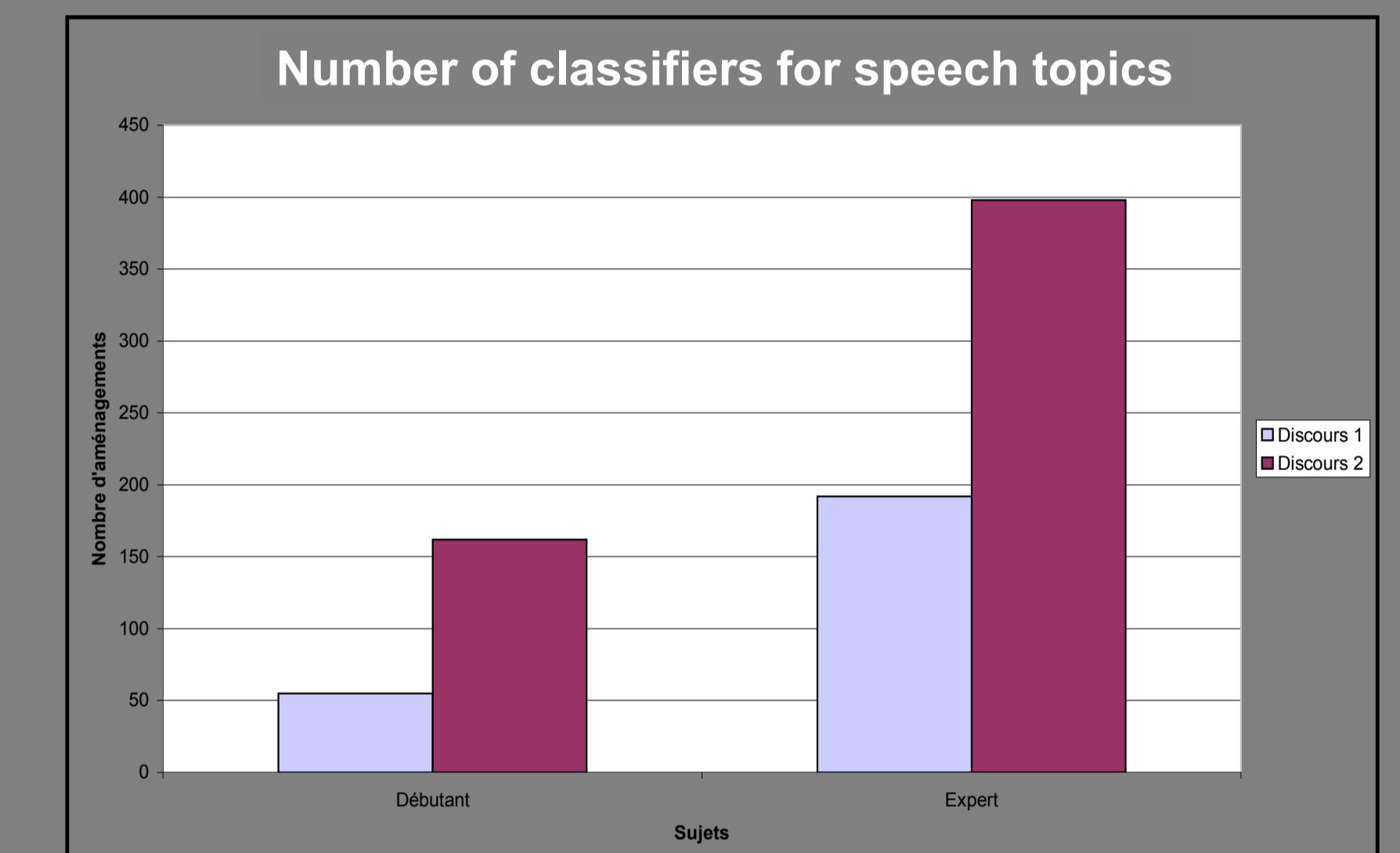
- ✓ No statistical difference
- ✓ More variation in experts group
- ✓ Speech effect: complexity of the discourse affects the lag time

H2: Experts will produce less signs

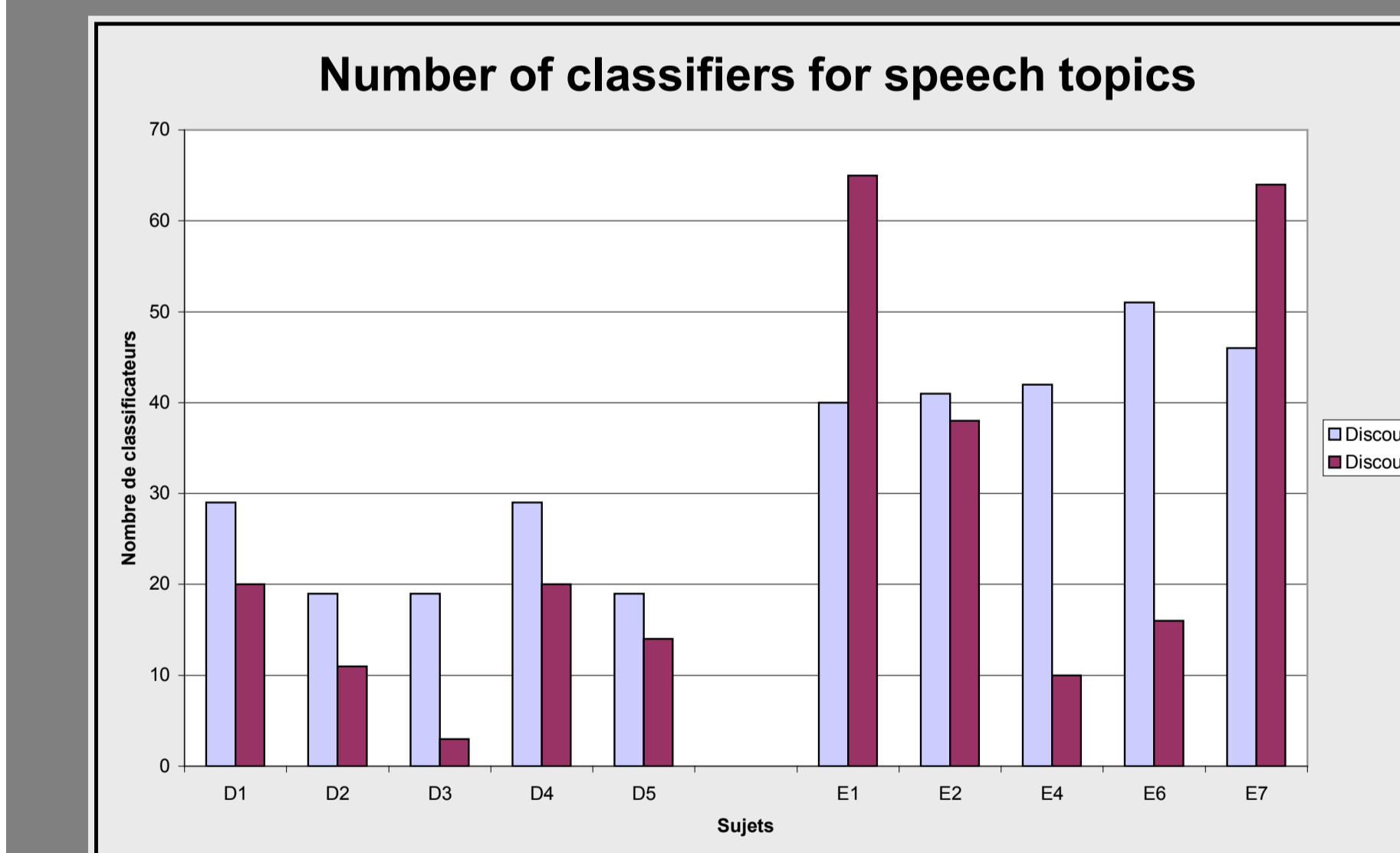
- ✓ No correlation between lag time and number of signs
- ✓ Statistical tendency: expert produce more signs ($p < 0.10$)
- ✓ Highly significant: expert use nondominant hand more than beginners ($p = 0.079$)

H3: Experts will do more articulatory economy structures

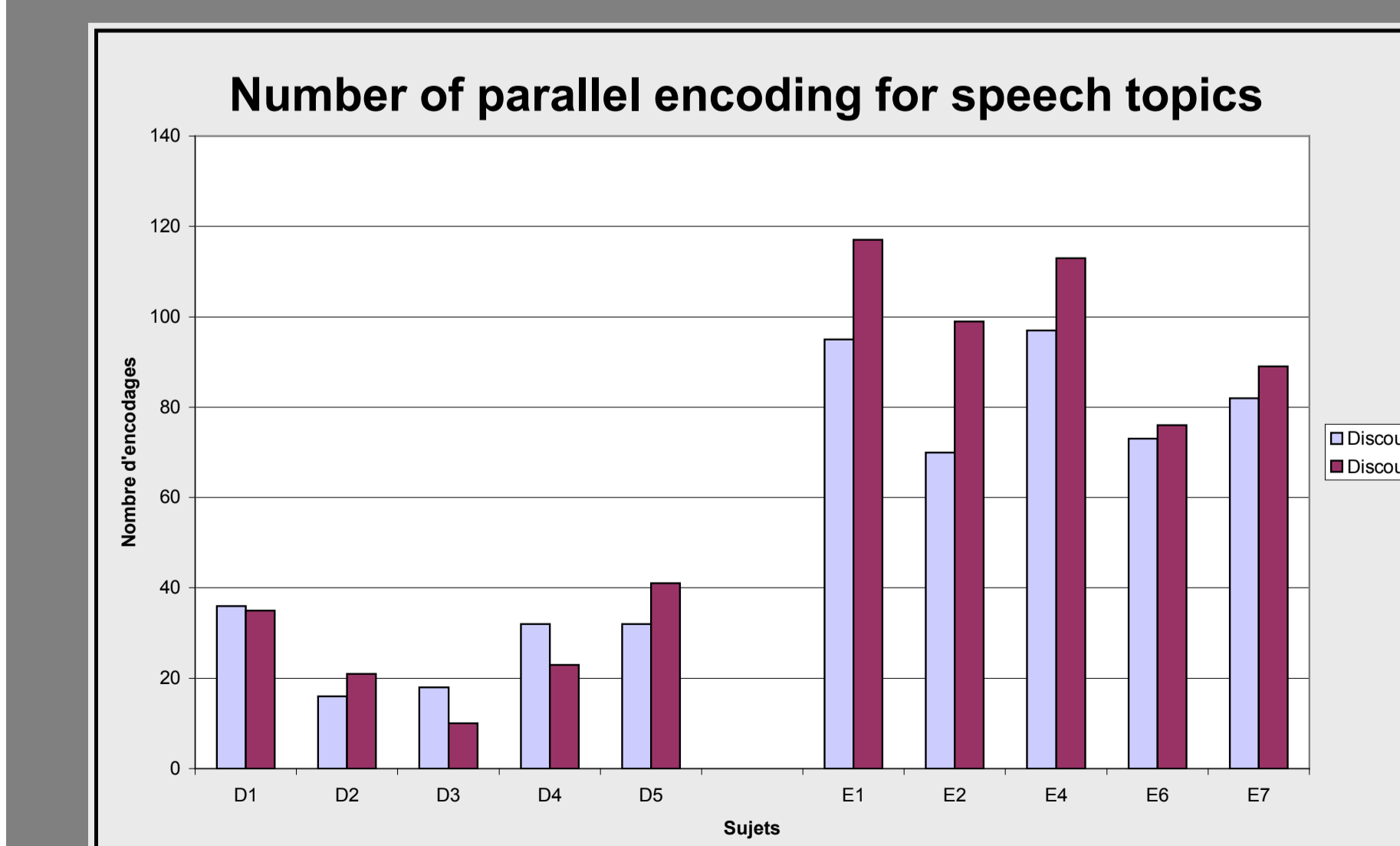
a) Phonological strategies



b) Morphosyntactic strategies



- ✓ Highly significant: experts produce more classifiers



- ✓ Highly significant: experts produce more parallel encoding

Conclusion

Aspect	Beginners	Experts
LagTime	=	=
Number of signs		Tendency +
Non dominant hand		High +
Assimilations		High +
Parallel encoding		High +
Classifiers		High +