

# 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                                       | Automatisms  |
|               | 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

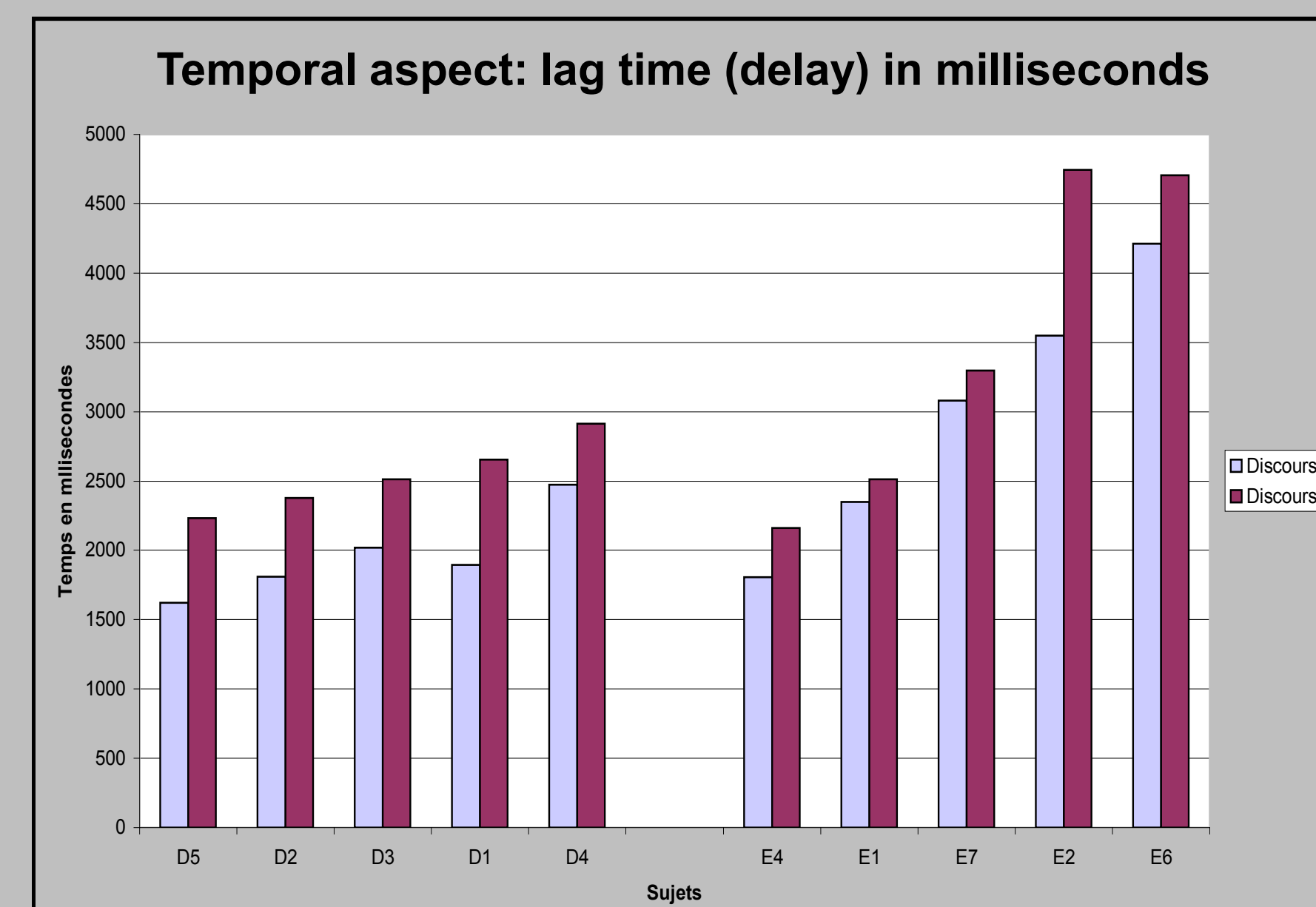
### Task

- ✓ 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



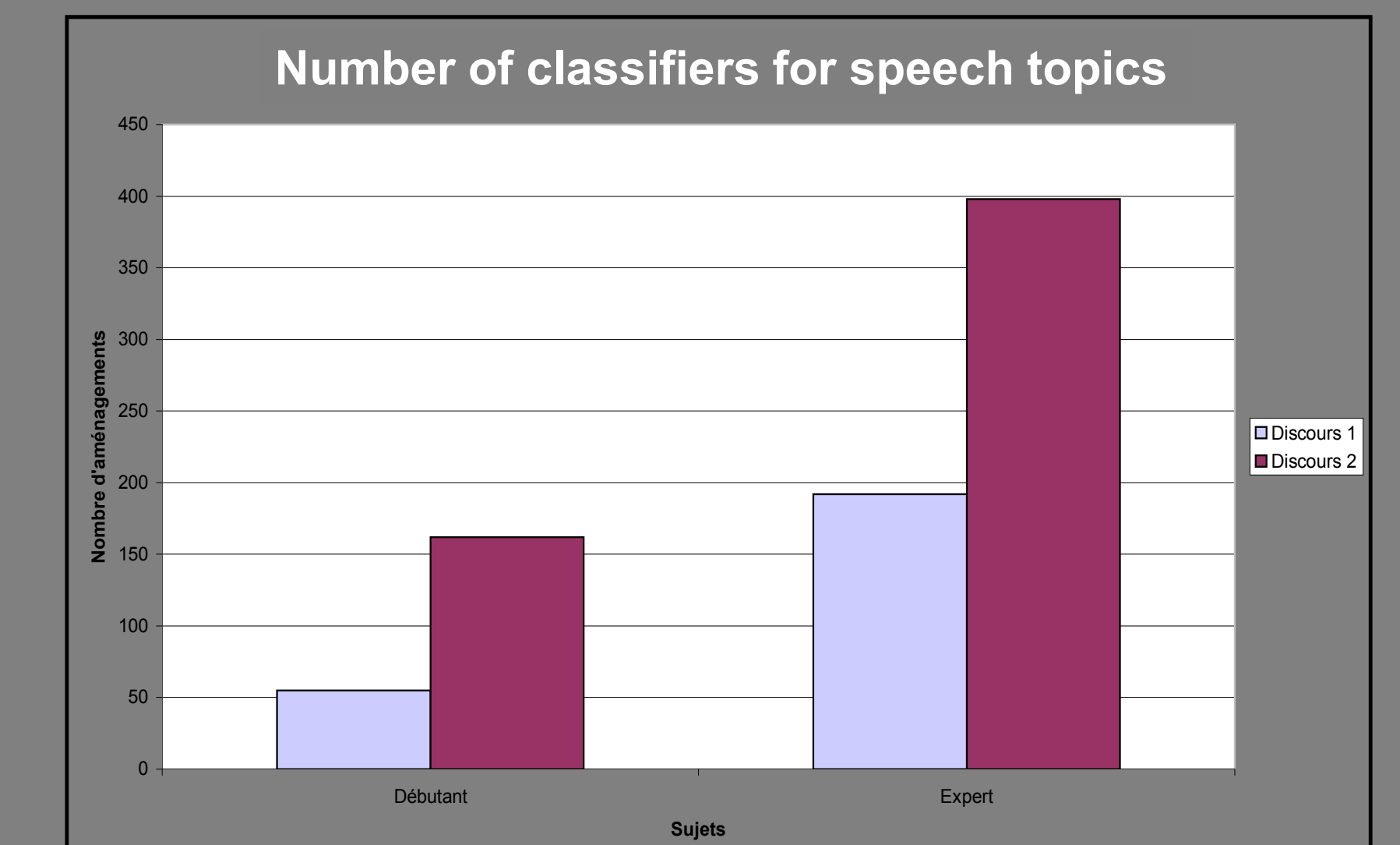
- ✓ No statistical difference
- ✓ More variation in experts group
- ✓ Speech effect: complexity of the discourse affects the lag time

## H2: Experts will produce less signs

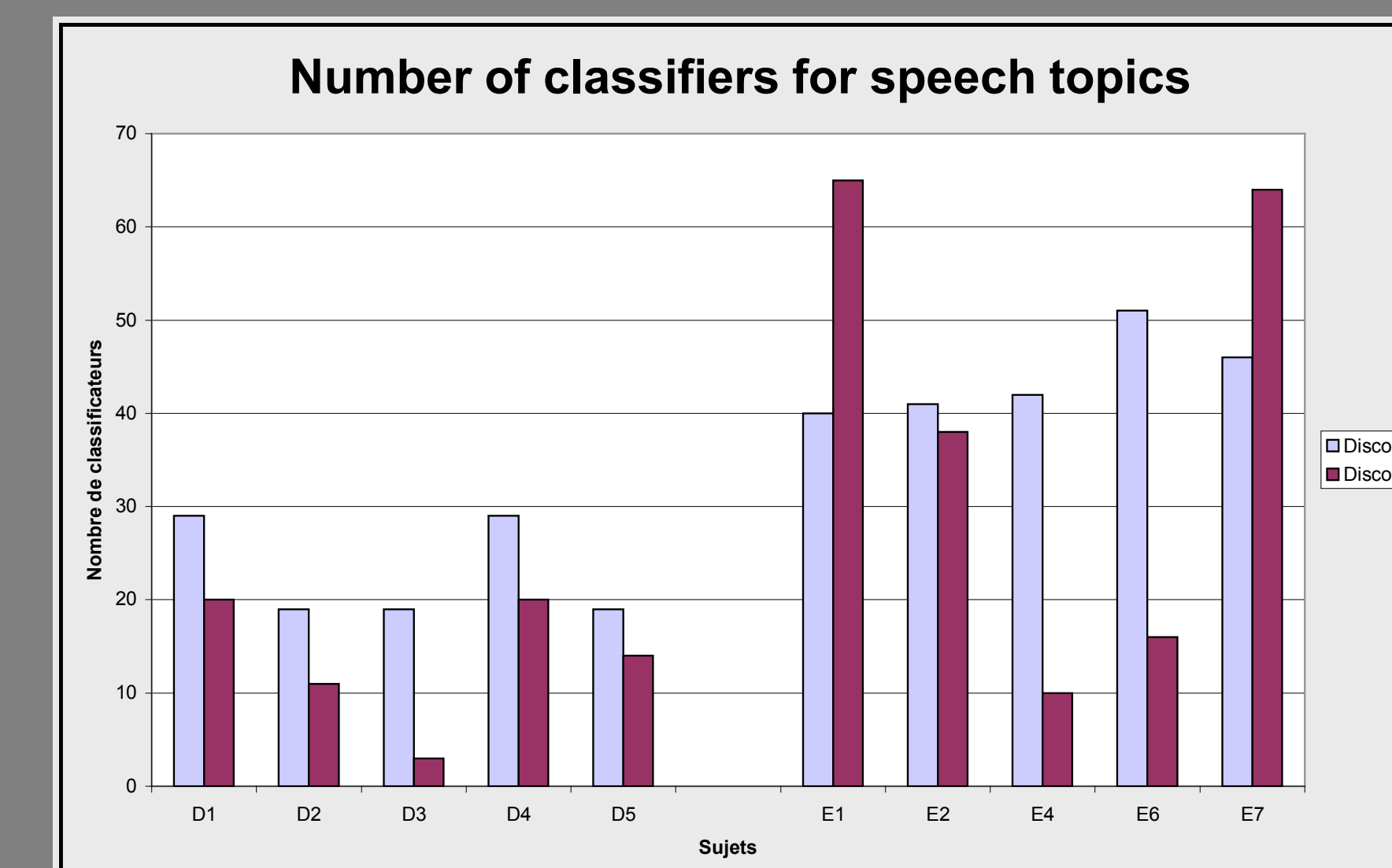
- ✓ No correlation between lag time and number of signs
- ✓ Statistical tendency: expert produce more signs ( $p < 0.10$ )
- ✓ Highly significant: expert use nondominant hand more than beginners ( $p = 0.079$ )

## H3: Experts will do more articulatory economy structures

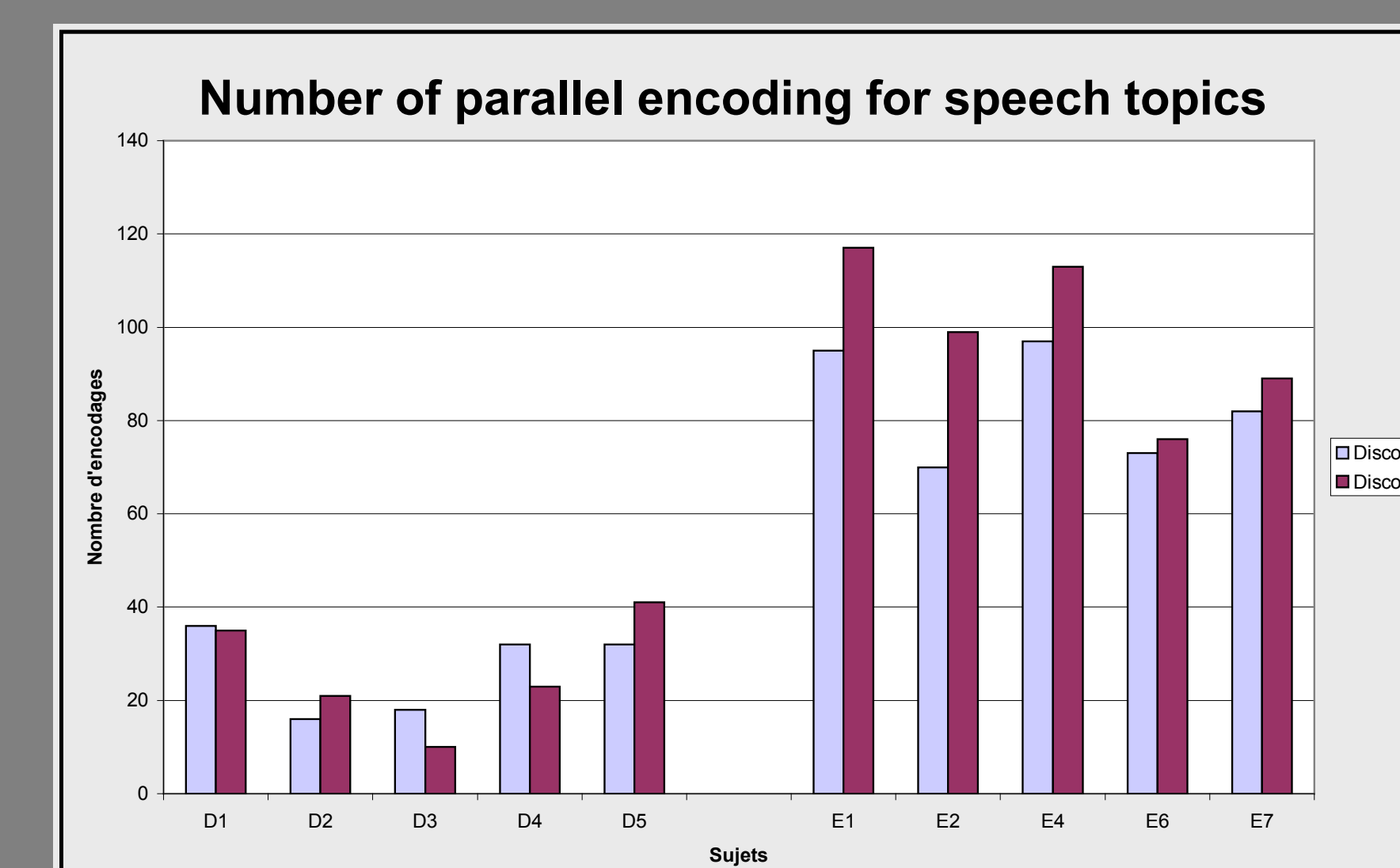
### a) Phonological strategies



### 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 +     |