Enhancing sensorial and linguistic accessibility with technology: further developments in the TECNACC and ALST projects

by Anna Matamala, Anna Fernández, and Carla Ortiz-Boix

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TECNACC & ALST projects

TECNACC	Post-edited MT vs human translation vs creation in AD	Evaluation of TTS AD's acceptance in films (Cat) as compared to human voices
ALST	Post-edited MT vs human translation in VO/OD	Evaluation of TTS VO/off-Screen dubbing in documentaries (Spanish)

TECNACC & ALST projects

- Common features
  - Oral transfer modes
  - Narrator with a clear voicing
    - off-screen dubbing
    - audio description
- Differences
  - MT engine
    - trained engine
    - online free engine
  - Language
    - Catalan
    - Spanish

TECNACC & ALST projects

- Previous or ongoing research/practice
  - TTS AD (Poland, Switzerland, Japan), TTS AST
  - MT in AVT: focus on subtitling in many projects such as SUMAT
- Novelty (to the best of our knowledge)
  - MT in oral modes such as AD and VO/Off-screen dubbing of documentaries
  - TTS acceptance in AD in Catalan
  - TTS in documentaries

TECNACC: TTS AD

TTS: 2-level experimental design

- Test on TTS AD acceptance
  - Female natural vs female artificial voice
  - Male natural vs male artificial voice

  By blind and visually impaired users

- Pre-test to select the voices to be used in the experiment

Voices

- Artificial voices: from the available engines in Catalan we selected 5 male and 5 female voices
  - Loquendo: Jordi and Montserrat
  - Verbio: Oriol and Meritxell
  - Acapela: Laia
  - iSpeech: Anna
  - FestCat: Pep, Jan, Teo and Ona

- Natural voices: 5 male and 5 female voices (with the help of ECAD)

AD units selection

- Viswanathan & Viswanathan (2005: 65) "**The same set of sentences** is used as input to all of the synthesizers in a study"
- 1 participant would therefore listen to the same set of AD units 20 times => fatigue and learning effect
- Two different sets of AD units: one set for the feminine voices and another set for the masculine ones => same stimulus for all feminine/masculine voice samples to be able to compare them properly
- Balance between the two sets of sentences as far as number of characters is concerned.

Voice selection test

- Pilot test
  - 6 participants
- Test
  - 20 participants
    - **6 men and 14 women ranging from 19 to 51**
- Two sessions:
  - 1st. synthetic voices
  - 2nd. natural voices (otherwise too long)
  - Short recorded AD units

Questionnaire's items selection

- Items related to ITU's quality factor rather than intelligibility – **9 items**
  - overall impression
  - listening effort / ease of listening / comfortable to listen to for a long period
  - acceptance
  - accentuation
  - pronunciation
  - speech pauses / audio flow / prosody
  - intonation
  - naturalness
  - voice pleasantness

Results

- Pilot test and experiment results match

1. Best feminine natural voice: D (**professional voice talent**)

2. Best masculine natural voice: no statistically significant differences among F, H and I, but H has a higher median and mean in overall impression (**student voice talent**)

3. Best feminine synthetic voice: no statistically significant differences between A and C (**Laia by Acapela and Meritxell by Verbio**), but A has a higher median and mean in overall impression (**Laia by Acapela**)

4. Best masculine synthetic voice: H (**Oriol by Verbio**)

The experiment

- Pilot test
  - 2 participants

- Test
  - 67 blind and visually impaired people
    - with many thanks to the **Visual Impairment Association of Catalonia**

The experiment

Age	Total	Women	Men
20 to 34	9	5	4
35 to 44	12	5	7
45 to 54	15	7	8
55 to 64	15	9	6
65 to 74	13	9	4
Older than 80	3	2	1
TOTAL	67	37	30

The experiment

- 2 male voices (synthetic/natural), 2 female voices (s/n)
- Same questionnaire and post-questionnaire
- Two different clips: female/male
- In depth analysis of the film, AD script and AD units to get to a balance between the two clips as far as:

The experiment

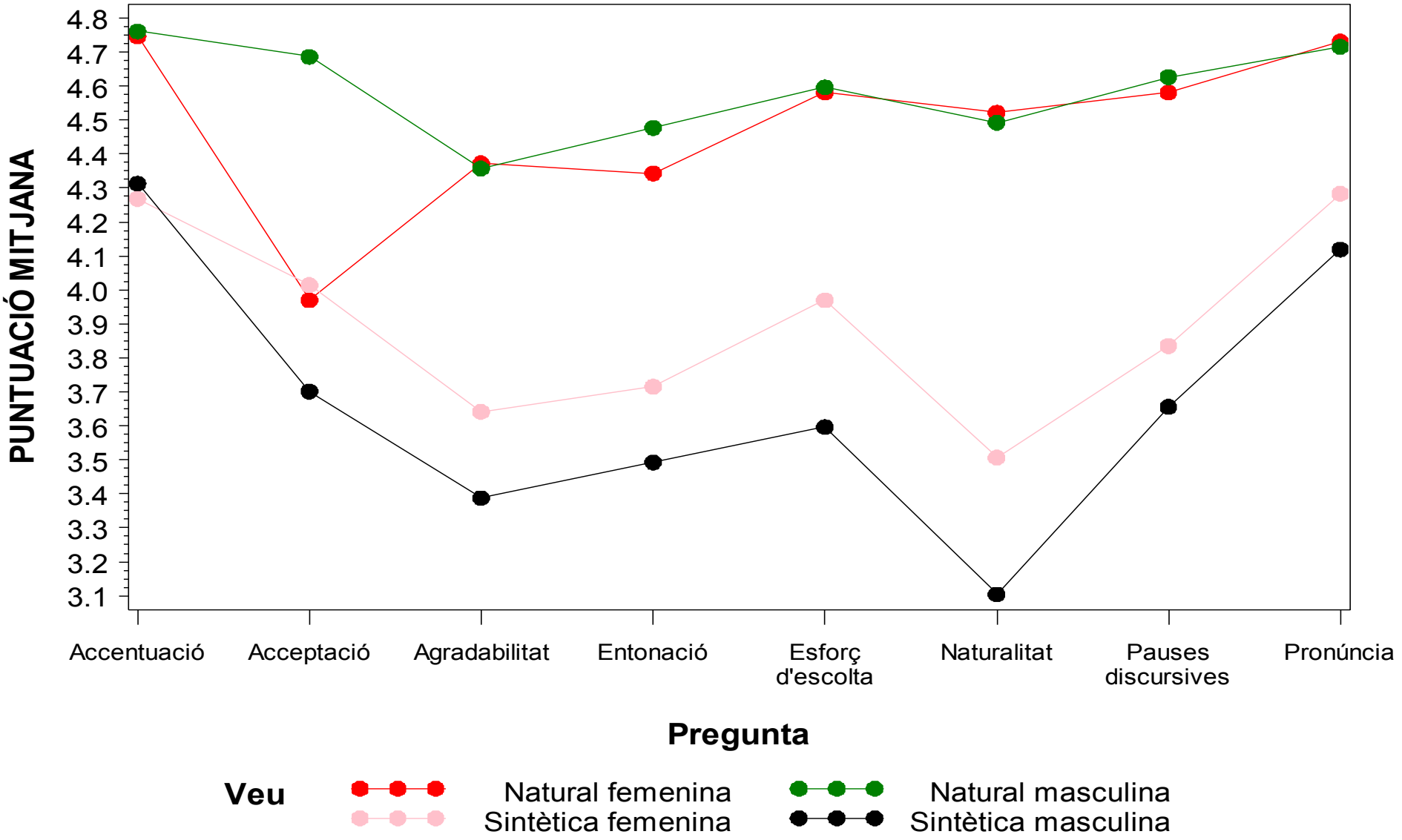
	Clip 1	Clip 2
Length in minutes	3 minutes	3 minutes and 6 seconds
Intervening characters	Anna and Dan	Anna and Dan
Background music	Opera *Così fan tutte ossia La scuola degli amanti*, by Mozart	Opera *Così fan tutte ossia La scuola degli amanti*, by Mozart
No potentially distracting and/or offensive content (eg. sexual tension)	Neutral	Neutral
AD density in characters	571 characters	537 characters

Results TTS AD

- Natural voices have higher values than artificial voices, as expected.

- No statistical differences between male/female natural voices.

- Female artificial voice, higher values than male artificial voice.


PUNTUACIÓ MITJANA
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Accentuació
Acceptació
Agradabilitat
Entonació
Esforç d'escolta
Naturalitat
Pauses discursives
Pronúncia
Pregunta
Veu
Natural femenina
Sintètica femenina
Natural masculina
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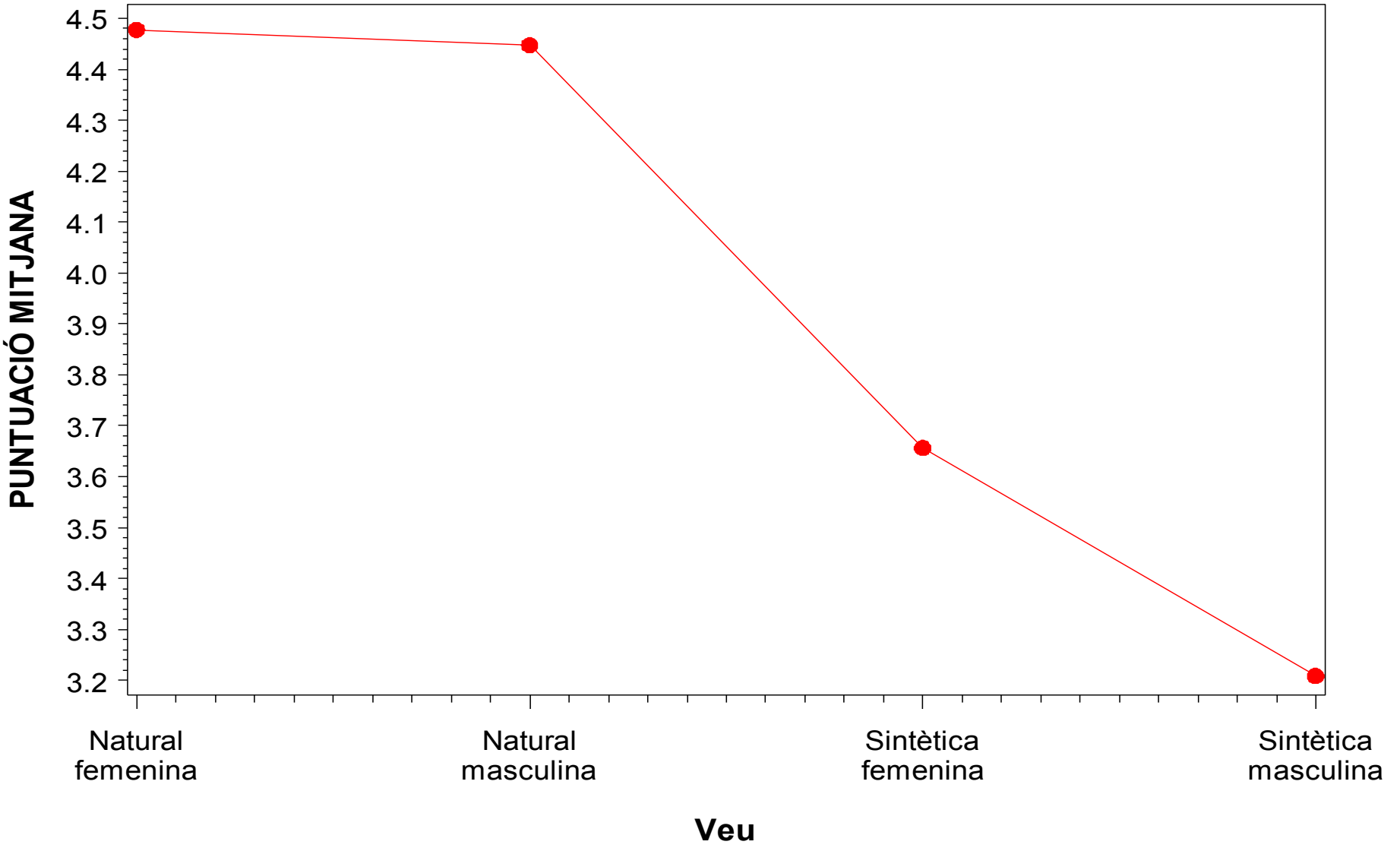
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Natural masculina
Sintètica femenina
Sintètica masculina
Veu

Results TTS AD

- Overall impression/acceptance: mean higher than 3.2

- 94% participants (out of 67)
  - TTS is an alternative acceptable solution, although not the preferred one.

- Current work: MT in AD

ALST
Experiment 1: MT in the translation of documentaries

Carla Ortiz-Boix's PhD

- Documentaries:
  - Off-screen dubbing
  - Voice-over

- Machine translation vs human translation

- Also, if possible, TTS in Documentaries

First decisions

- What do I want to test?
  - MT + Post-editing vs human translation in terms of
    - Process
      - Time
      - Effort
        - » Technical (keyboard strokes)
        - » Cognitive (post-questionnaires)
    - Result
      - Quality assessment

First decisions

- Free online or trained engine
  - Customized engine: Domain specific
  - 90 documentaries (200,000 aprox words)
    - Challenging, time-consuming… exploring other possibilities.
- Participant profile:
  - professional translators vs MA students
    - influence of previous background
- Platform and integration of audiovisual content

Future work

- Define and carry out the post-editing experiments on Documentaries (2014)

- Carry out the TTS experiment on documentaries (2015)

Thank you

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