

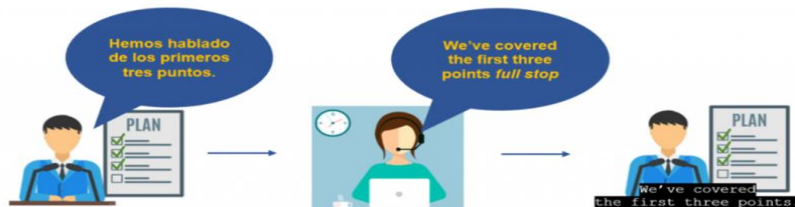
Shaping Multilingual Access Through Respeaking Technology (2020-2023, ES/T002530/1)
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INTERLINGUAL RESPEAKING

STUDY DESIGN

DOI: 10.13140/RG.2.2.30610.12481

Innovative method for **real-time speech-to-text** whereby respeakers listen to live input and simultaneously render it (with added oral punctuation, content labels and software-adapted delivery) in a target language to speech recognition software that turns it into written text displayed on screen

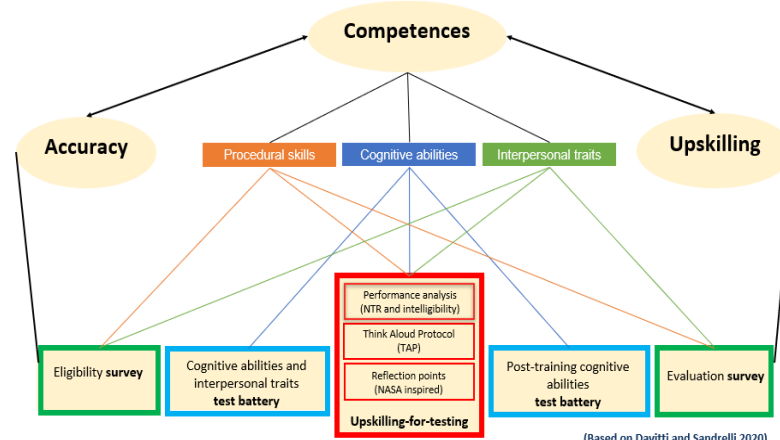


Process: 'simultaneous interpreting 2.0'

Product: live text in a different language

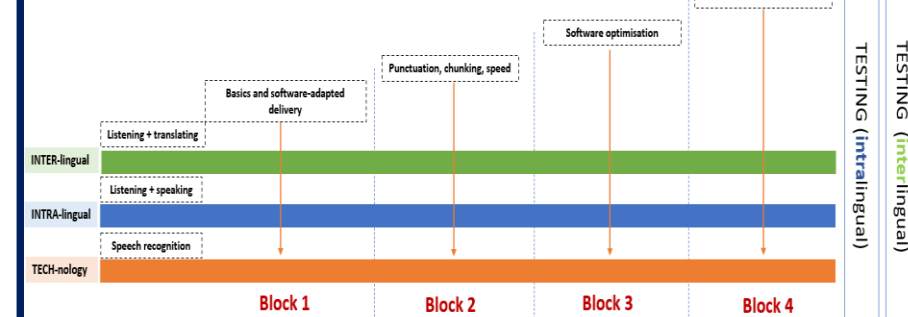
Complex form of **human-AI interaction**
Hybrid, multimodal, human-centric, in-demand practice

Methodological design



- Exploratory approach
- Mixed-methods
- Multi-staged experiment
- Within-subjects design

Upskilling-for-testing structure



- 25h course; online delivery across 5 weeks
- Blending and scaffolding approach (technique-specific)
- Dual purpose: collecting performance-related data and testing our approach to upskilling
- Final tests in both intralingual and interlingual respeaking across different scenarios (speed, planned/unplanned, multiple speakers)

OBJECTIVES AND RESEARCH QUESTIONS

SELECTED INSIGHTS INTO THE PROCESS

SELECTED INSIGHTS INTO THE PRODUCT

PROCESS: To refine existing multifactorial models of competence - what human variables underly the performance of language professionals, what challenges arise during performance, and to what extent it can be sustained

PRODUCT: To explore what contributes to output accuracy - how well do language professionals do after 25h of upskilling and what are the predictors of high accuracy

UPSKILLING: To optimise upskilling for language professionals - what challenges arise during skills acquisition and what are the strengths and weaknesses of the upskilling course

We investigated empirically (baseline) what **cognitive abilities** and **interpersonal traits** underly interlingual respeaking performance.

Cognitive abilities: focus on **executive functions** (Miyake et al. 2000), particularly **working memory (WM)**, **shifting skills**, and **sustained attention** (known effects on simultaneous interpreting as a closely related practice); six cognitive tasks (verbal fluency, plus-minus, digit span, reading span, N-back, sustained attention to response); repeated-measures ANOVA and multiple regressions.

- WM**, $F(1, 46) = 4.0, p = .05$ (from $M = .83, SE = .02$ to $M = .88, SE = .02$) and **shifting skills**, $F(1, 49) = 6.42, p = .02$ (from $M = 22.90 s, SE = 2.95 s$ to $M = 14.55 s, SE = 1.85 s$) were enhanced after the upskilling course, indicating that these skills are required for high interlingual respeaking performance. **WM** was found to predict high performance ($\beta = .36, p = .01$).
- Sustained attention** did not improve as $p > .05$, so alternative forms of attention should be investigated (e.g., divided attention).

Interpersonal skills: eight scales used to measure different traits, namely trait anxiety, resilience, impulsivity, cognitive flexibility, innovativeness in IT, personality, work motivation and mindfulness.

- Conscientiousness** (TIPI, $\beta = -.32, p = .02$) and **integrated regulation** (when 'work is part of you', WEIMS, $\beta = -.28, p = .04$) negatively predict accuracy. These findings can be linked to the real-time and cognitively demanding nature of this practice.

We used the NTR model (Romero-Fresco and Pöchhacker 2017) to measure the **accuracy** of 153 performances under different scenarios (speed, planned/unplanned, multiple speakers). We used an **intelligibility** scale (based on Tiselius 2009) for determining high and low performers, which was validated in the results obtained.

Accuracy - average NTR results

- across all participants and testing scenarios: **95.37%**
**For reference: intralingual respeaking accuracy benchmark = 98%
 Interlingual respeaking benchmark yet to be established*
- | Per language directionality | Per scenario |
|-------------------------------------|----------------------------------|
| Romance into English: 96.16% | Speed: 94.76% |
| English into Romance: 94.89% | Planned/unplanned: 95.83% |
| | Multiple speakers: 95.51% |

- Across all scenarios, **omissions** ($\beta = -1.12, p < .001$) were the strongest negative predictor of accuracy, followed by substitutions ($\beta = -.17, p < .001$) and recognitions ($\beta = -.34, p < .001$).
- Effective editions**, changes in the target text which do not lead to a loss of information, were positive predictors of accuracy across all scenarios ($\beta = .31, p = .03$).
- High performers** ($n = 27$) scored significantly higher ($M = 96.3%, SE = .2%$) than low performers ($n = 24, M = 94.4%, SE = .2%$) across all scenarios, $p < .001$. They made significantly fewer omission and correctness errors and used effective editions significantly more than low performers.

PARTICIPANTS

Fifty-one language professionals selected out of 250+ applicants
Professional backgrounds: minimum 2,000h work experience in translation, interpreting and/or pre-recorded/live subtitling; majority with 3+ professions in their cluster (composite profiles)
Languages: 17 between English and each romance language (French/Italian/Spanish); 32 English>Romance; 19 Romance>English
Demographics: 8 males, 43 females; *Age* = 40.12 years, *SD* = 10.97 years; from 11 countries (UK, Spain, Italy, France, Germany, Belgium, Australia, Argentina, New Zealand, USA, Peru)

