Virtual Reality and stuttering:
a tool for experiential learning in preservice speech therapy education

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Aim

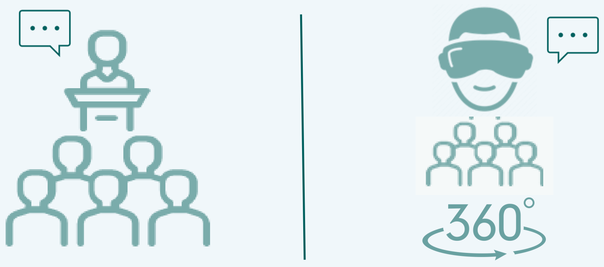
By asking preservice speech therapists to pseudo-stutter in front of an audience and having them reflect on the affective, cognitive and behavioural aspects of stuttering, we aim to increase stutter awareness. At universities and colleges, it is difficult to provide groups of students with individual experiential learning situations. **This research aimed to provide insight into the value of VR as a tool to provide experiential learning through VR and simulate stutter-related social anxiety.**

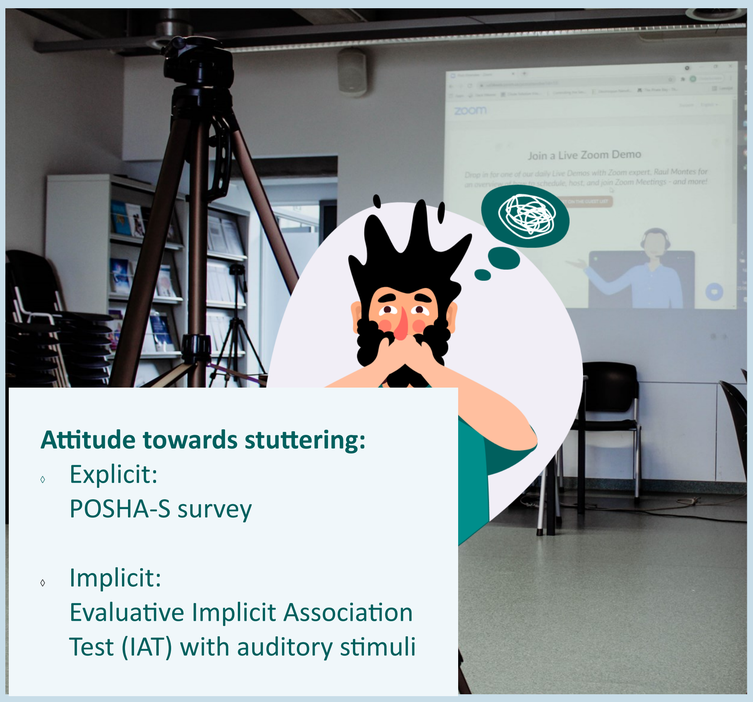
Set-up

64 Bachelor students Speech Language Pathology

2 speech tasks with pseudo-stuttering

- before a live audience and in a VR environment
- audience showed negative non-verbal reactions in both conditions





Attitude towards stuttering:

- Explicit:
  POSHA-S survey
- Implicit:
  Evaluative Implicit Association Test (IAT) with auditory stimuli



Anxiety

- Subjective Units of Distress Scale.
  How anxious do you feel?
  0 (no fear) - 100 (extremely anxious)
- Physiological responses
  heart rate, respiration and skin conductance responses.

Experience-based learning [1]

Experiential Learning Cycle

Concrete experience

The learner encounters a concrete experience When the VR environment is more realistic, it promotes learning outcomes [2].

Reflective observation

Student thinks about the whole course of the task and reflects on his/her own actions from different perspectives [3].

Abstract conceptualization

Reflection gives rise to a new idea, or a modification of an existing abstract concept.

Active experimentation

The theory learned is applied in a new or different context so that generalisation can occur.

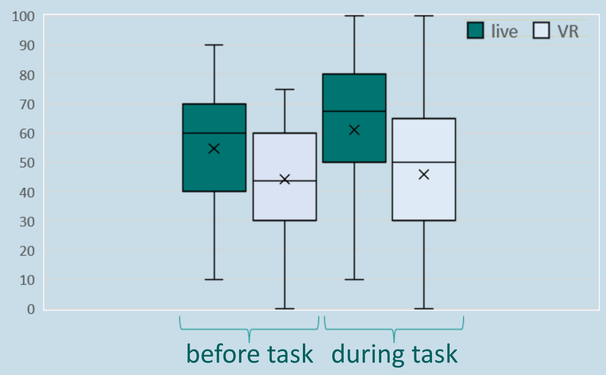
The ten listeners in VR showed the same negative non-verbal reactions as the live audience.



Results

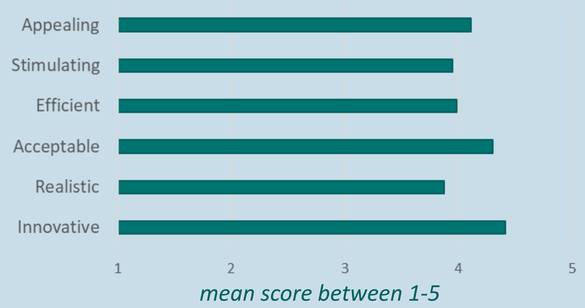
They showed **high reported fear** and **physiological fear responses in both the Live condition and the VR condition**. The order of the conditions and the score on the Fear of Negative Evaluation questionnaire had no influence.

Subjective Units of Distress Scale (SUDS)



VR experience

To what extent did you find the VR environment...



mean score between 1-5
where 1 = 'not at all' and 5 = 'extremely'

Significantly lower in the VR than the real-life condition:

- Subjective Units of Distress (Mdiff = -15.19, 95% CI [-21.50; -8.87], t(63) = -4.81, p < .001; Cohen's dz = -.601)
- Heart rate (Mdiff = -5.33, 95% CI [-7.96; -2.71], t(58) = -4.07, p < .001; Cohen's dz = -.530) medium effect size

No significant difference between conditions:

- RSA (Mdiff = -.058, 95% CI [-.479; .364], t(52) = -.275, p = .784)
- EDA (Mdiff = .465, 95% CI [-.054; .983], t(54) = 1,797, p = .078)

Positive explicit attitudes towards stuttering

- The Public Opinion Survey of Human Attributes-Stuttering (POSHA-S)
- Overall Stuttering Score of 24.49 (SD = 9.78)

Negative implicit attitudes towards stuttering

- Implicit Attitude Test (IAT) for Stuttering
- Average moderate automatic preference of .43 (SD = .32) for fluent speech over stuttering speech

Relation between Attitude & Anxiety

- Pearson correlation coefficients between scores of SUDS, POSHA-S and IAT were not significant.

Implications & limitations



Dare to stutter

Pseudo-stuttering sessions are aimed at desensitization:

- for future therapists, it is adamant that they become comfortable with stuttering so that they do not send (non)verbal signals that stuttering makes them anxious

Disability simulation

However, due to focus on the symptom, too much emphasis on the DISability rather than empathy?

Expectation/processing

Differences in reported anxiety are also influenced by expectations and/or post hoc processing of the exercise. It is important to understand how students' experiences and processing contribute to the desensitisation process.

VR benefits

- gradual, safe, time-efficient
- immediate feedback [4].

Conclusion

There is a need for **stutter awareness training** in preservice speech therapists, given the negative implicit attitudes towards stuttering. Simulated stuttering in VR is a tool for facilitating the first phase of the learning cycle: it can make the speaking experience feel **real**, which aligns with the **contact hypothesis**.

VR is capable of inducing **increased physiological anxiety** in students who pseudo-stutter and can be particularly helpful in students who find the natural setting too threatening.

References

http://www.kuleuven.be/exporl/ helena.deman@kuleuven.be

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