Spoken disfluency

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The impact of disfluency, pacing, and students' need for cognition on learning with multimedia

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ABSTRACT

In the current study, it was examined how learning with multimedia is affected by disfluency, pacing, and students' need for cognition. Contrasting hypotheses were derived regarding how reducing the audio quality of spoken text by integrating hissing (disfluent) would affect learning outcomes. According to cognitive load theory, a disfluent audio quality should hamper learning, while according to disfluency theory, a disfluent audio quality should foster learning, especially when learning is self-paced. Moreover, self-paced learning should be particularly beneficial for learners with a high need for cognition (NFC). The hypotheses were tested in a 2 × 2-design, with quality of spoken text (regular vs. disfluent) and pacing (system-paced vs. self-paced) as independent variables and NFC as continuous variable. Supporting cognitive load theory, disfluent text decreased performance in a transfer and pictorial test. There was no significant interaction between spoken text quality and pacing. However, in line with previous research, self-pacing led to longer learning times and increased performance in a retention and in a transfer test. Moreover, results revealed that self-pacing had beneficial effects on understanding particularly for learners with a high NFC. This suggests that whether self-pacing of a multimedia instruction fosters understanding depends on learners' specific cognitive prerequisites.

Scopo della ricerca

- L’apprendimento da multimedia può essere migliore se lo studente mette in atto processi di apprendimento più profondi, attivi.
- Come si ottiene?
- Qui si studiano 3 fattori: disfluency - need for cognition - pacing

Teorie a confronto

Teoria del Carico cognitivo

- Evitare le difficoltà non necessarie
- Background noise

Disfluency

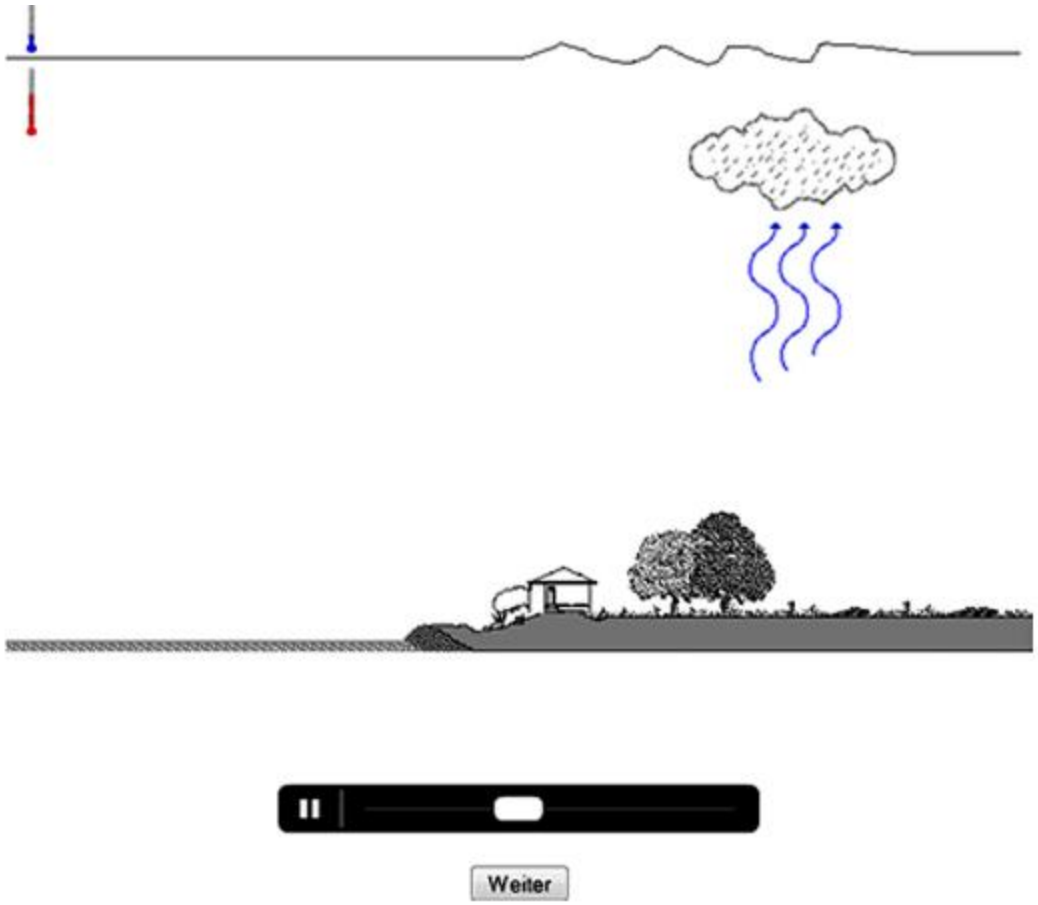
- le difficoltà percettive dovrebbero provocare un’elaborazione più profonda.

- pacing
- Avere il controllo sulla presentazione
- System-paced,
- Learner-paced

- Misure:
- Need for cognition

(I really enjoy a task that involves coming up with new solutions to problems..)

- Subjective rating of cognitive load..



Snapshot taken from the multimedia learning environment in a self-paced condition. Instructional materials were adapted from Mayer (200

Table 1
Means (and SD/*SE*) as a function of spoken text quality and pacing.

Spoken text quality	Regular audio quality		Disfluent audio quality	
Pacing	System-paced ($n = 21$)	Self-paced ($n = 18$)	System-paced ($n = 20$)	Self-paced ($n = 20$)
Digit span test (0–20)	13.43 (3.37)	13.11 (2.32)	13.15 (2.58)	12.45 (2.31)
NFC (16–112)	83.95 (11.36)	77.72 (10.70)	76.50 (14.82)	82.00 (10.20)
Cognitive load				
Mental effort (1–7)	5.48 (1.12)	5.33 (0.91)	5.15 (1.23)	5.15 (1.35)
ECL (1–7)	3.62 (1.56)	3.06 (1.39)	4.15 (1.31)	3.05 (1.43)
Use of learning environment				
Total learning time (in seconds)	121.90 (0.00)	277.35 (91.40)	121.90 (0.00)	263.35 (87.11)
Listening time (in seconds)	121.90 (0.00)	197.08 (61.16)	121.90 (0.00)	180.98 (36.07)
Learning outcomes[a]				
Retention	5.39 (0.66)	7.80 (0.69)	3.93 (0.66)	7.59 (0.65)
Transfer	2.75 (0.39)	3.49 (0.41)	1.61 (0.39)	2.72 (0.38)
Pictorial matching test	6.65 (0.31)	7.19 (0.33)	6.48 (0.31)	5.82 (0.31)
Manipulation check				
Acoustic understandability (1–7)	6.62 (0.80)	6.83 (0.38)	2.75 (1.55)	3.45 (1.70)
Perceived acoustic quality (1–7)	6.33 (1.24)	6.56 (0.62)	2.00 (1.52)	2.30 (1.53)

Note: Higher scores in the table indicate a higher digit span, a higher need for cognition, more invested mental effort during learning, more experienced ECL (difficulty) during learning, longer learning and listening times, better performance in the knowledge tests (retention, transfer and pictorial matching), better acoustic understandability and better perceived acoustic quality.

[a] Means and standard errors are corrected for the influence of need for cognition.

risultati

- Nella condizione self-paced si sta più tempo sul compito (sempre) e si hanno migliori risultati
- Chi ha il testo di buona qualità apprende meglio
- I risultati supportano la CLT perché la performance di chi ha il testo disfluente è peggiore.
- Le potenzialità degli studenti con un alto NFC non si possono realizzare in un contesto system-paced.

Teacher, the tape is too fast!

- Ascoltare è difficile

- https://www.academia.edu/2064584/The_Tape_is_too_fast

- Non si può rileggere
- È troppo veloce