EXAMPLE-BASED LEARNING: A TEST OF THE MODEL-OBSERVER SIMILARITY (MOS) HYPOTHESIS

Vincent Hoogerheide, Margot van Wermeskerken, Sofie Loyens, & Tamara van Gog

Utrecht University

v.hoogerheide@uu.nl

ERASMUS UNIVERSITEIT ROTTERDAM

Introduction

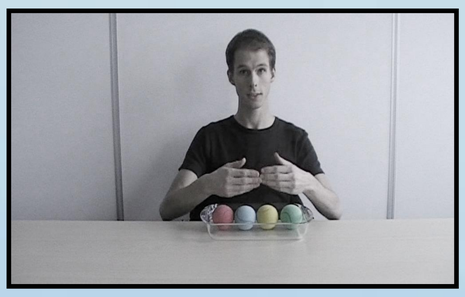
- Example-based learning is very effective for enhancing students' learning outcomes and the confidence in their own abilities (i.e. self-efficacy and perceived competence). This applies to worked examples (written step-by-step demonstration of how to solve a problem) and (video) modeling examples (demonstration provided by a person, the so-called model).[1,2]
- Model-observer similarity (MOS) hypothesis states that the degree to which (video) modeling examples foster students' learning and confidence is moderated by the extent to which learners perceive themselves to be similar to the model.[3]
- Findings have been mixed, possibly because manipulations of the similarity between learners and the model across conditions often also affected what the model said and did.
- Therefore, it was examined whether students benefit more from video modeling examples with a similar than a dissimilar model *when the content is kept equal*. Additionally, the open question was explored whether MOS would affect learning from text-based worked examples.

Video Modeling Examples: Effects of Gender

Adolescents (N = 167) learned how to solve probability calculation problems.

Between-subject factor: Gender Observer (Female vs. Male)
Between-subject factor: Gender Model (Female vs. Male)

Female Model



Male Model

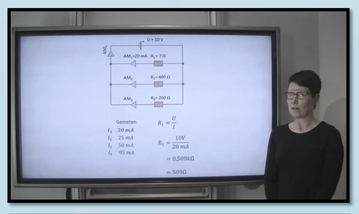
	Results
Learning Outcomes	✗
Mental Effort	**Study Phase:** Gender Model x Gender Observer (η_p^2 = .03) **Posttest:** ✗
Confidence	Male Model > Female Model (η_p^2 = .03)* *only for perceived competence

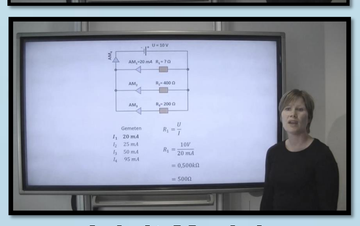
Hoogerheide et al. (2016). Learning from video modeling examples: Does gender matter? *Instructional Science, 44*, 69-86.

Video Modeling Examples: Effects of Age and Expertise

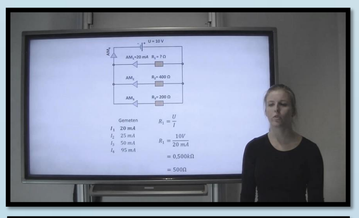
Adolescents (N = 157) learned how to troubleshoot electrical circuits.

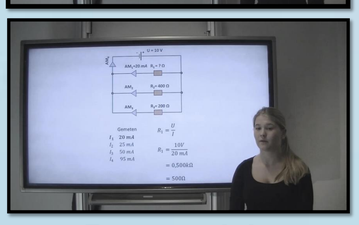
Between-subject factor: Age Model (Peer vs. Adult)
Between-subject factor: Expertise Model (Low vs. High)





Adult Models





Peer models

	Results
Learning Outcomes	Adult Model > Peer Model (η_p^2 = .04)
Mental Effort	**Study Phase:** Adult Model > Peer Model (η_p^2 = .03) **Posttest:** ✗
Confidence	✗

Hoogerheide et al. (2016). Learning from video modeling examples: Content kept equal, adults are more effective models than peers. *Learning and Instruction, 44*, 22-30.

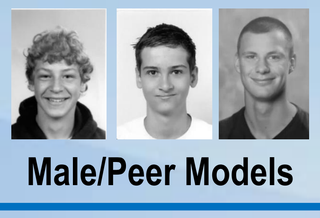
Worked Examples: Effects of Gender and Age/Expertise

Adolescents (Exp. 1: N = 147, Exp. 2: N = 130) learned how to troubleshoot electrical circuits.

Exp. 1: Gender Observer (Female vs. Male) x Gender Model (Female vs. Male)

Exp. 2: Gender Observer (Female vs. Male) x Age/Expertise Model (Peer vs. Teacher)

Female Models



Male/Peer Models

Teacher Models

	Results Exp. 1	Results Exp. 2
Learning Outcomes	✗	✗
Mental Effort *Study Phase & Posttest*	✗	✗
Confidence	✗	✗

Hoogerheide et al. (in press). Testing the model-observer similarity hypothesis with text-based worked examples. *Educational Psychology.*

Conclusions

- Studying video modeling examples or worked examples was very effective for students' learning and confidence.
- None of the experiments showed any MOS effects on learning outcomes, confidence, or effort investment. Perceptions of the model only mattered in video modeling examples and not in worked examples, possibly because videos contain a stronger social component.
- A reason why a male model fostered perceived competence more than a female model, and why adults were more effective and efficient models than peers, might be that students viewed the math skill as more appropriate for males than females, and the physics skill as more appropriate for adults than peers.
- Thus, similarity perceptions may not matter (as much) when the example content is kept equal. Rather, task-appropriateness views may determine the effects of model characteristics on students' learning and motivational outcomes.

1. Van Gog, T., & Rummel, N. (2010). Example-based learning: Integrating cognitive and social-cognitive research perspectives. *Educational Psychology Review, 22*, 155-174.
2. Hoogerheide, V., Loyens, S. M. M., & Van Gog, T. (2014). Comparing the effects of worked examples and modeling examples on learning. *Computers in Human Behavior, 41*, 80-91.
3. Schunk, D. H. (1987). Peer models and children's behavioral change. *Review of Educational Research, 57*, 149-174.