



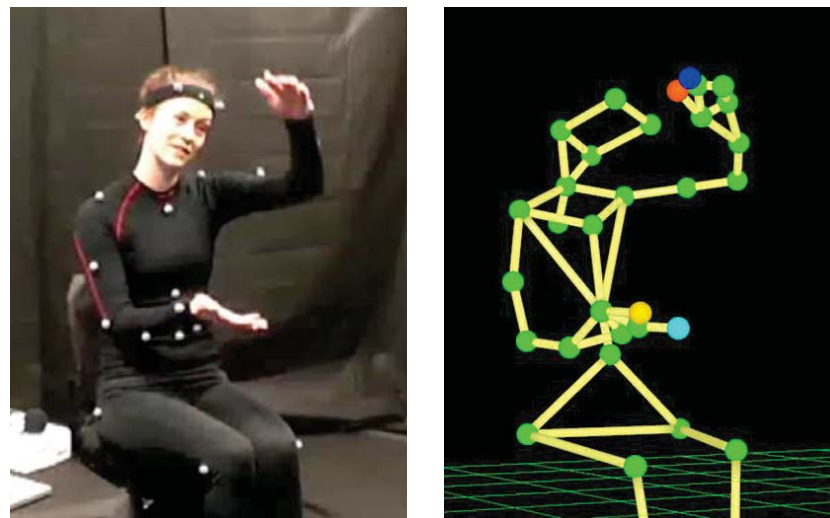
Size Certainly Matters – At Least if You Are a Gesticulating Digital Character

The Impact of Gesture Amplitude on Addressees' Information Uptake

Does gesture amplitude and overall appearance of a virtual agent affect addressees' information uptake? Researchers at the department of Cognitive Science at Lund University are interested in these questions. Based on a motion capture recording the researchers varied gesture amplitude and physical appearance of a digital character. The purpose was to determine how to create expressive qualities within virtual agents that make addressees perceive them in the desired way.

I. Gesture Amplitude

- Participants' information uptake was compared in two conditions:
 - 1) speakers' spontaneous gestures (original gesture amplitude),
 - 2) the same gestures manipulated (non-algorithmically) to max amplitude.
- Participants' information uptake was significantly higher in the amplified gesture condition (Fig. 1).



II. Material

- 120 undergraduate students aged 18-57 ($M=23$).
- Four different videos on 15-17" laptops:
 - 1) original gesture amplitude, humanoid character,
 - 2) amplified gesture size, humanoid character,
 - 3) original gesture amplitude, alien character,
 - 4) amplified gesture size, alien character.
- 22 multiple-choice statements.
- Questionnaire with 1-6 Likert scale.

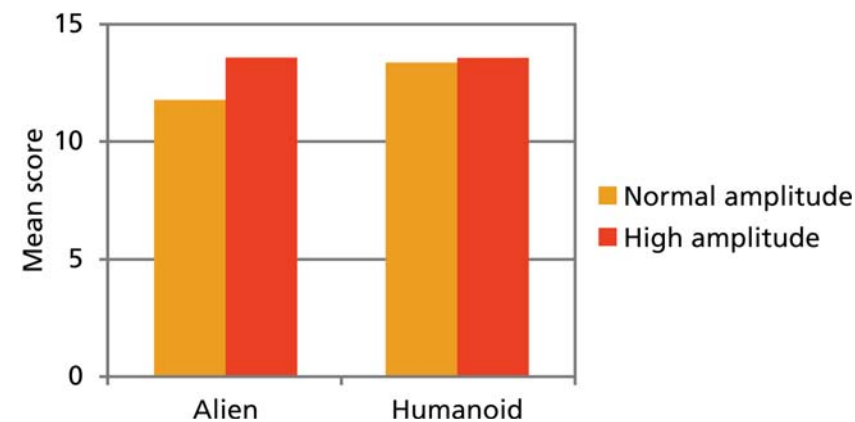


Fig. 1: Information uptake.

IV. Summary

As no previous study has been made on gesture amplitude with virtual agents, we tested information uptake in conditions with natural gestures vs. amplified gestures and with a humanoid vs. an "alien" character. Information uptake was significantly higher in the amplified gesture condition. Also, comparing a humanoid character with its alien counterpart, participants rated the humanoid's gestures significantly more natural and less distracting than those of the alien, despite both of them being animated with the same motion capture data. We also found a strong trend that the humanoid was more facilitating on information recall than the alien.

III. Subjective Ratings

- Participants rated the humanoid significantly more natural and less distracting than the alien character, as indicated by (*) in figure 2 below.
- Participants tended to perceive the gestures of the humanoid more facilitating on information uptake than those of the alien, as indicated by (**) in figure 2 below.

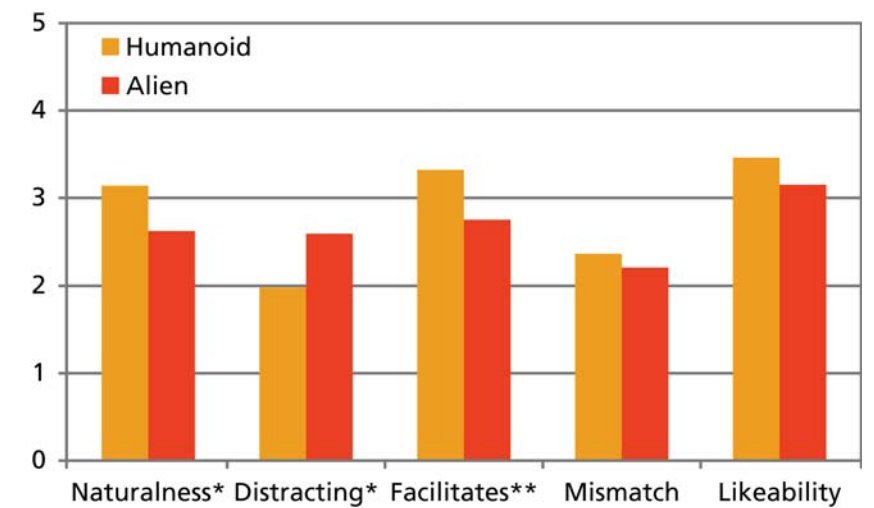


Fig. 2: Participants' ratings.

V. Conclusion

Virtual characters or agents are being increasingly applied to digital educational tools and software developers might be tempted to focus on the likeability or the humanness of the digital characters in an intuitive attempt to reinforce information uptake. However, our study shows that other parameters, like gesture amplitude, naturalness, and degree of attention or distraction may influence information uptake more than likeability.

Hopefully, future studies will contribute to the establishment of proper criteria and guidelines for developers to follow.

