

AniSAM & AniAvatar – Animated visualizations of affective states

THEORY AND PROBLEM

Measuring and providing visual feedback about emotions has become increasingly important. While a great deal of effort has already been put into the reliable and accurate automatic detection of emotions (Scherer, 2005), **very little is known about how this information about affective states should be displayed** (Ku et al., 2005).

In the present study, **two new animated feedback tools** (AniSAM and AniAvatar) were evaluated and compared to existing static ones (OriginalSAM and MergedSAM).

The tools were developed on the basis of an existing non-verbal questionnaire to assess two dimensions of emotion (i.e. valence and arousal) based on the circumplex model of affect (Russel, 1980).

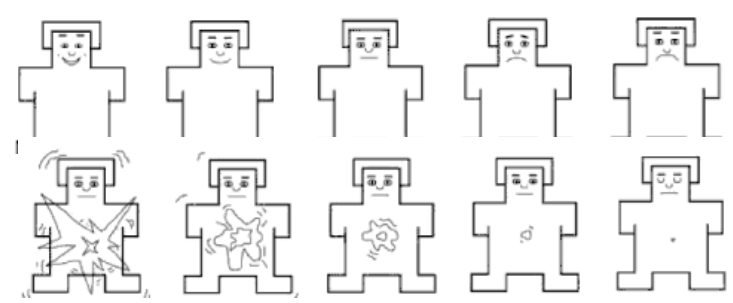


Figure 1: Manikins of the original SAM scale (valence and arousal; OriginalSAM).

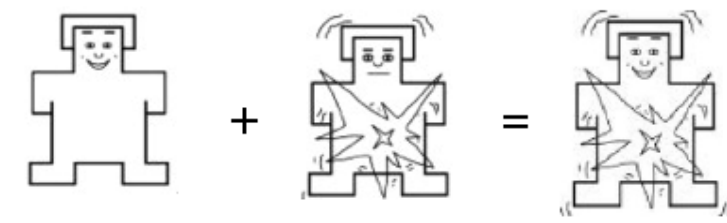


Figure 2: Combination of SAM-measures of valence and arousal (MergedSAM).

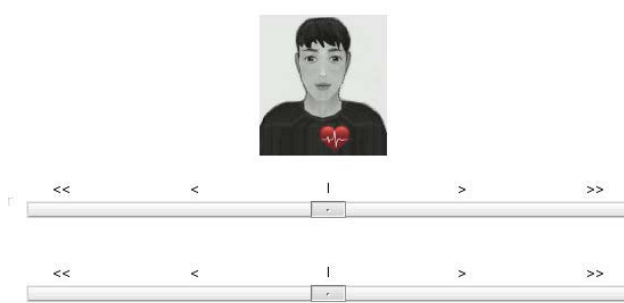
Hypotheses:

- animated representations of affective (i.e. AniAvatar & AniSAM) states are more accurate in representing arousal than the static representations.
- the avatar representation is more accurate than the SAM for valence representation.

METHOD AND MATERIAL

- 4 x 2 x 2 mixed design
- Feedback tool (between subjects): AniSAM, AniAvatar, OriginalSAM and MergedSAM
- Valence of vignettes (within subjects): positive vs. negative
- Arousal of vignettes (within subjects): high vs. low

- DVs
 - accuracy of the emotion visualization tool for valence and arousal (11 vignettes)



- Participants: N = 826 (81% female, M = 24.6 yrs)
 - N = 353 for ground truth evaluation of vignettes
 - N = 473 for evaluation of feedback tool

- Vignettes (examples):
 - On Carsten's birthday, his friends surprise him with a birthday-party (Excited – positive valence, high arousal).
 - Aline is taking the lift. A man enters and pulls out a knife. He just stares at her saying nothing about what he wants (Afraid/alarmed – negative valence, high arousal).

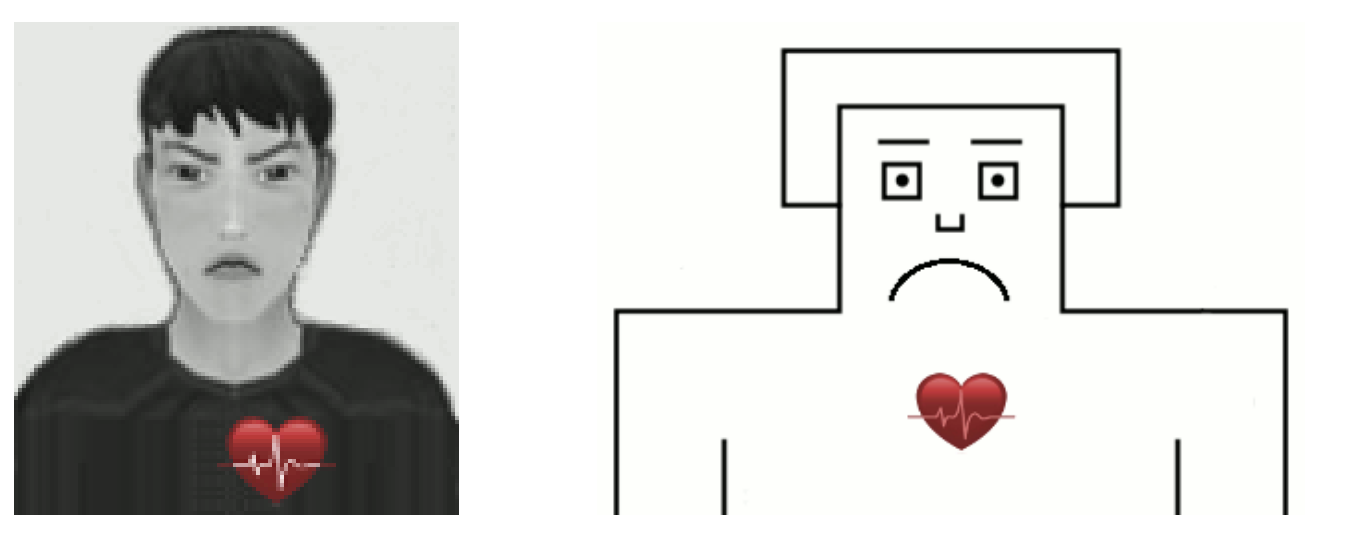
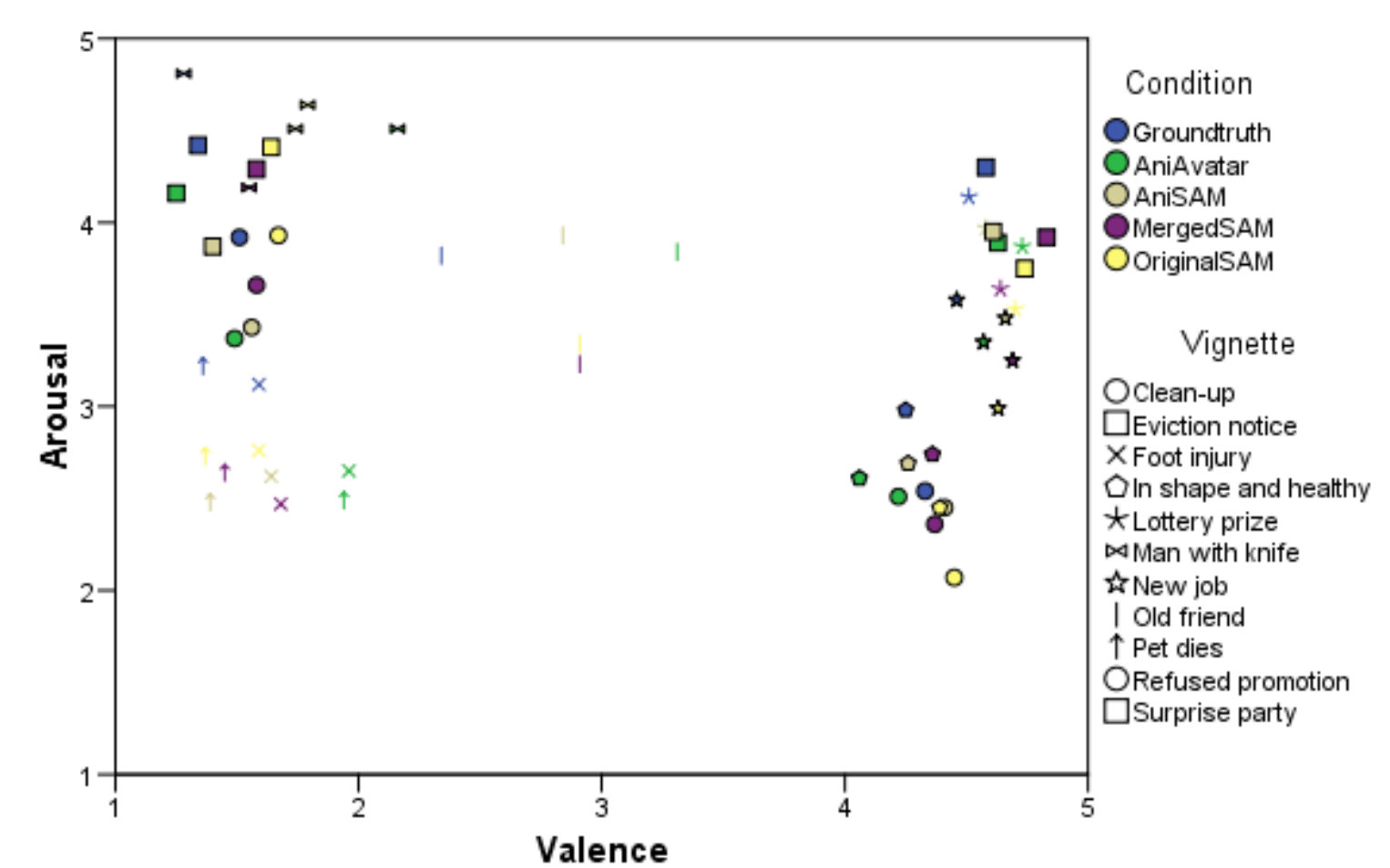


Figure 3: Animated Feedback Tools (AniSAM and AniAvatar)

MAIN RESULTS

Manipulation check



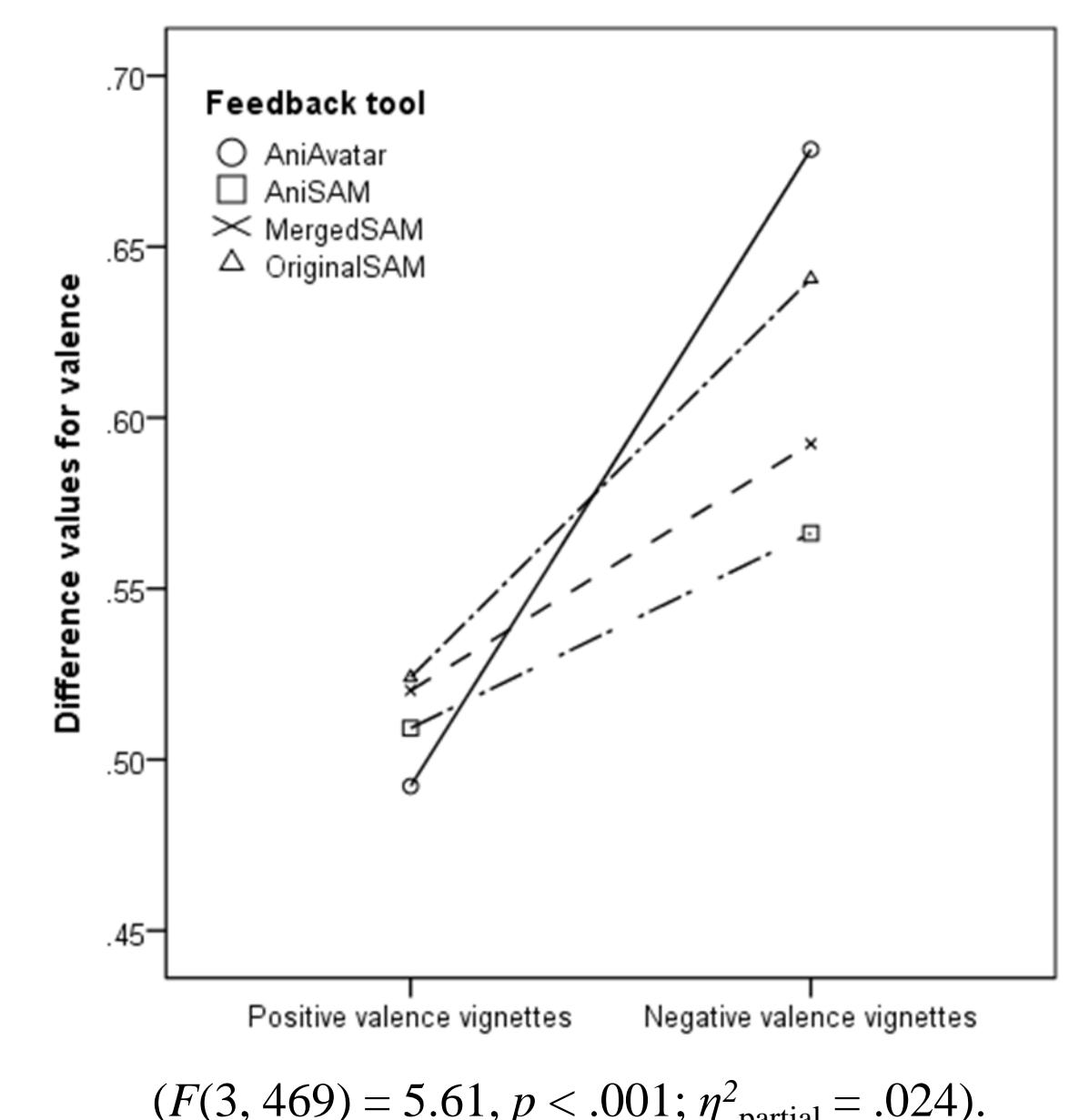
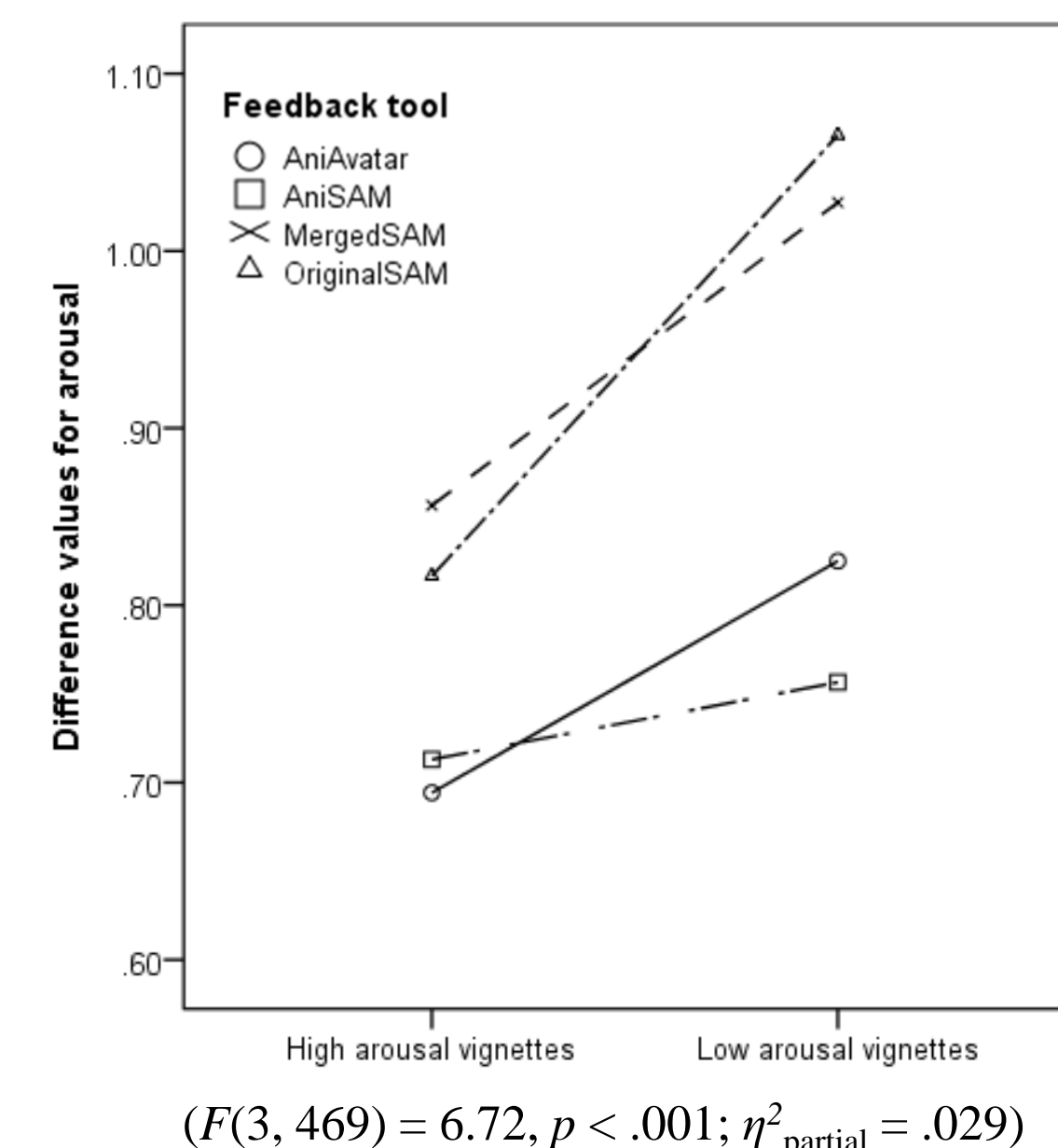
($t_{arousal}(352) = 113.27, p < .001, d = 9.51$) ($t_{valence}(352) = 113.27, p < .001, d = 2.78$).

Accuracy of affective feedback tools

	AniSAM	AniAvatar	MergedSAM	OriginalSAM	<i>d</i>
	M (SD)	M (SD)	M (SD)	M (SD)	
Arousal	.73 (.28)	.75 (.27)	.93 (.27)	.93 (.32)	.67
		***	***	***	.61
		***	***		.73
			***		.67
Valence	.57 (.14)	.63 (.14)	.59 (.16)	.60 (.16)	.43
		**			

($F_{arousal}(3, 469) = 16.94, p < .001; \eta^2_{partial} = .098$; and $F_{valence}(3, 469) = 3.6, p < .05; \eta^2_{partial} = .023$; post-hoc tests: Tuckey's HSD corrected).

Feedback tools x vignettes



DISCUSSION AND CONCLUSION

- Animated affective feedback tools (AniSAM and AniAvatar) more accurate in visualizing arousal.
- More accurate valence estimation for AniSAM.
- No difference between MergedSAM Original SAM
 - ➔ combination of valence and arousal dimension has no negative effect on mood representation.
- Usefulness of the AniSAM and AniAvatar as effective feedback tools for affective states.

REFERENCES

- Ku, J., Jang, H. J., Kim, K. U., Kim, J. H., Park, S. H., Lee, J. H., Kim, J. J., Kim, I. Y., & Kim, S. I. (2005). Experimental results of affective valence and arousal to avatar's facial expressions. *Cyberpsychology & Behavior: The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, 8(5), 493–503. doi:10.1089/cpb.2005.8.493
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