Evaluating the Uncanny Valley with the Implicit Association Test (IAT)

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gv2 graphics • vision • visualisation

INTRODUCTION

Realistic 3D computer generated characters are judged more harshly, since the human visual system uses the featural restrictions of other humans for realistic but not abstract (cartoon-like) characters [3].

Is there a positive affinity towards abstract as opposed to realistic characters?

IAT is a standardised method for indirectly measuring the strengths of associations among concepts [1]. Task: sorting of stimulus exemplars from four concepts, paired in two response options. This task is easier when the two concepts that share a response are strongly associated than when they are weakly associated.

PROCEDURE

Number of participants: 28 (14 male, 14 female).

Stimuli: 5 realistic and 5 abstract images of virtual characters;
5 pleasant (*sunrise, freedom, lucky, pleasure, love*) and 5 unpleasant words (*death, accident, poison, hatred, grief*).

Task: a) categorising words (Pleasant–Unpleasant) and virtual characters (Realistic–Abstract) by choosing left or right category on the screen;
b) subjective ratings of the character's "Appeal" 1 (Extremely Unappealing) - 7 (Extremely Appealing).

Data analysis: recording response times of the categorisations, calculation of individual D measures (altered *Cohen's d* or effect size) with the revised algorithm [2].

REFERENCES:

[1] GREENWALD, A. G., MCGHEE, D. E., AND SCHWARTZ, J. L. 1998. Measuring individual differences in implicit cognition: the implicit association test. Journal of personality and social psychology 74, 6, 1464.

[2] GREENWALD, A. G., NOSEK, B. A., & BANAJI, M. R. 2003. Understanding and using the implicit association test: I. An improved scoring algorithm. Journal of personality and social psychology, 85, 2, 197.

[3]SEYAMA, J., AND NAGAYAMA, R. S. 2007. The uncanny valley: Effect of realism on the impression of artificial human faces. Presence: Teleoperators and Virtual Environments, 16, 4, 337–351.

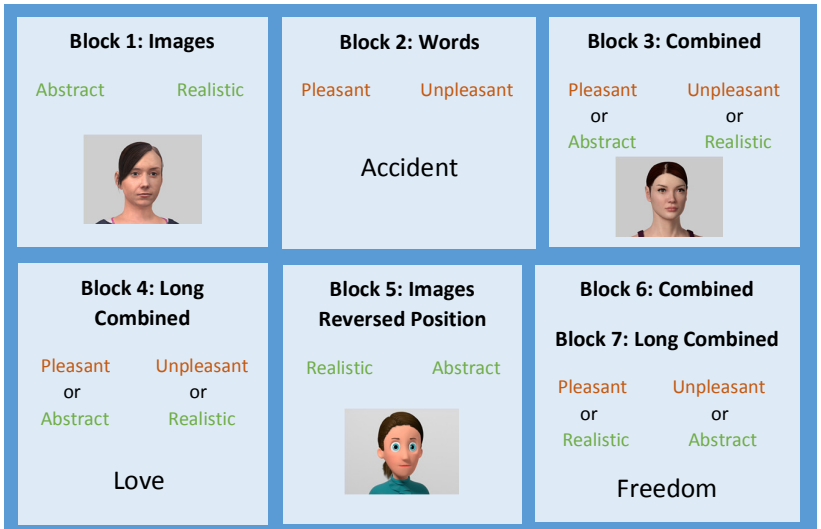

Figure 1: IAT blocks. Participant had to quickly and accurately categorise stimuli in the left or right category. After a correct response, the stimuli changed. Otherwise, an error message appeared and the answer had to be corrected. Long combined blocks (4, 7) had double amount of stimuli repetitions. The order of categories in the first block was randomized for each participant to avoid ordering effects.

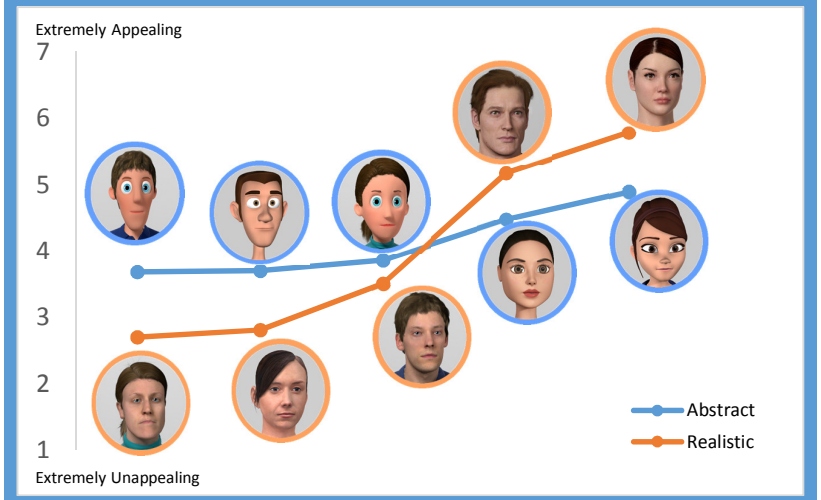

Figure 3: average subjective ratings of Appeal for individual stimuli by category used in the IAT task.

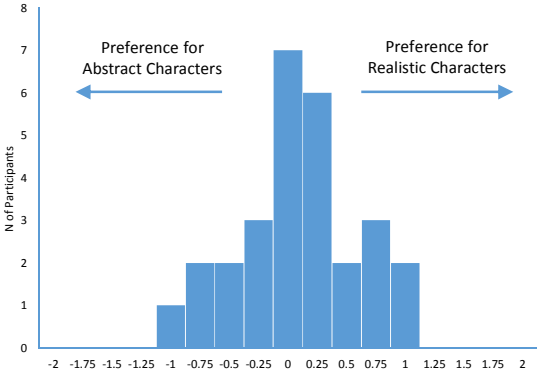

Figure 2: the distribution of individual D measures of the IAT.

RESULTS

No preference for either category of characters, Realistic or Abstract (Figure 2).

Repeated measure ANOVA on the mean latencies in the test blocks of the IAT showed no significant differences between the combinations of paired categories.

There were variations of subjective reports on Appeal between characters (Figure 3). However, ANOVA showed no significant difference in appeal between the two categories of characters.

CONCLUSIONS

No preferences towards abstract as oppose to realistic characters were found with the IAT or subjective measures.

Realism itself is not necessarily a predictor of affinity.

No implicit preferences!

It is possible to use IAT to measure people's preferences towards a particular type of virtual character.

Limitation of the test: characters must be put in two clearly distinct categories. Only useful when testing attitudes that are not easily accessible with subjective reports.