Perceptual Fluency does not necessarily increase aesthetic appreciation

Evidence against the Hedonic Fluency Model

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Motivation

In the domain of aesthetic research it is often claimed that aesthetic pleasure is a function of the perceiver's processing dynamics. According to the Hedonic Fluency Model (Winkielman, Schwarz, Fazendeiro, & Reber, 2003), the perceptual fluency of a stimulus has an influence on affective judgments about this stimulus, i.e. higher positive judgments with increasing perceptual fluency. As reason for this prediction the authors state a hedonic quality of fluency itself. There is strong evidence for this prediction, as it is reflected in many studies (for reviews see e.g. Reber, Schwarz, & Winkielman, 2004).

Nevertheless, many studies on perceptual fluency show certain flaws: First, the stimuli used in the affective judgment tasks mostly are very simple and artificial, i.e. geometric forms (Reber, Winkielman, & Schwarz, 1998), dot patterns (Winkielman, Halberstadt, Fazendeiro, & Catty, 2006) or simple line drawings (Griffiths & Mitchell, 2008; Reber et al., 1998). In consequence of the usage of such simple material the stimuli are often affectively neutral, in some cases slightly positive. To our knowledge, there is no published work in which stimuli with positive or negative valences are systematically tested in terms of the Hedonic Fluency Model (Winkielman et al., 2003).

The aim of our study was therefore to re-test the assumptions of the Hedonic Fluency Model (Winkielman et al., 2003) with more "realistic" stimulus material, i.e. photographic images of different scenes (people, animals, objects) with different complexity and a wide range of valence.

Method

Apparatus. 60 Stimuli were selected from the IAPS database (Lang, Bradley, & Cuthbert, 2005). As we chose perceptual priming to manipulate perceptual fluency, primes were conducted from the stimuli, showing only the contours of the original pictures (see Figure 1). The experiment was done on Mac OS X, version 10.4.11, with PsyScope X 53. Input was recorded via Cedrus USB button box (precision of RT recording < 1 ms).

Procedure. A manipulation check (pre-study 1; $n1$ = 10) was done to ensure the perceptual priming affecting the perception of the stimulus material. A t-test revealed significant shorter reaction times (RT's) in the highly fluent (prime = target) than in the lowly fluent condition (prime ≠ target), $t(59) = 1.74$, $p = .09$, $d = .2$. In pre-study 1, valence was assessed to ensure a balanced distribution to all grades of valence. The stimuli fitted to 5 valence categories with category 1 being the lowest category of valence and category 5 the highest. Each category contained 12 stimuli.

In a second pre-study (pre-study 2; $n2$ = 10), complexity of the stimuli was assessed on a 6-point Likert scale with 1 = "sparsely complex" to 6 = "highly complex". The ratings demonstrate a wide range in this construct, $M = 2.9$, $SD = 1.5$.

Method (Cont.)

In the main experiment 20 persons participated, one had to be excluded because of a record error. 19 persons remained (7 male, mean age = 30.6 ys., range 21 - 51). 60 Primes (7 ms) and targets (1,000 ms; SOA = 507 ms) were shown in the highly fluent and the lowly fluent condition (120 trials in total). Participants were asked to assess their affective reaction as fast and accurate as possible on a 6-point Likert scale with 1 = "very negative" to 6 = "very positive".

Data Analysis. Affective ratings were analyzed by a two-way mixed design Analysis of Variance (ANOVA) with repeated measurements with *category of valence* (1 to 5) as between-stimulus factor and *degree of fluency* (highly fluent vs. lowly fluent) as within-stimulus factor.

Results

Results are displayed in Table 1. According to the predictions of the Hedonic Fluency Model (Winkielman et al., 2003), a main effect of *degree of fluency* was expected. However, the analysis only revealed a marginally significant effect. Moreover, the factor *category of valence* reached significance, regarding to a strong association between the valence judgment and the affective judgment. More importantly, a significant interaction effect between the factors *degree of fluency* and *category of valence* was obtained (see Figure 2). Post hoc t-tests revealed significant differences between the lowly fluent and the highly fluent condition in the categories of valence 1, 4 and 5, p's < .05.

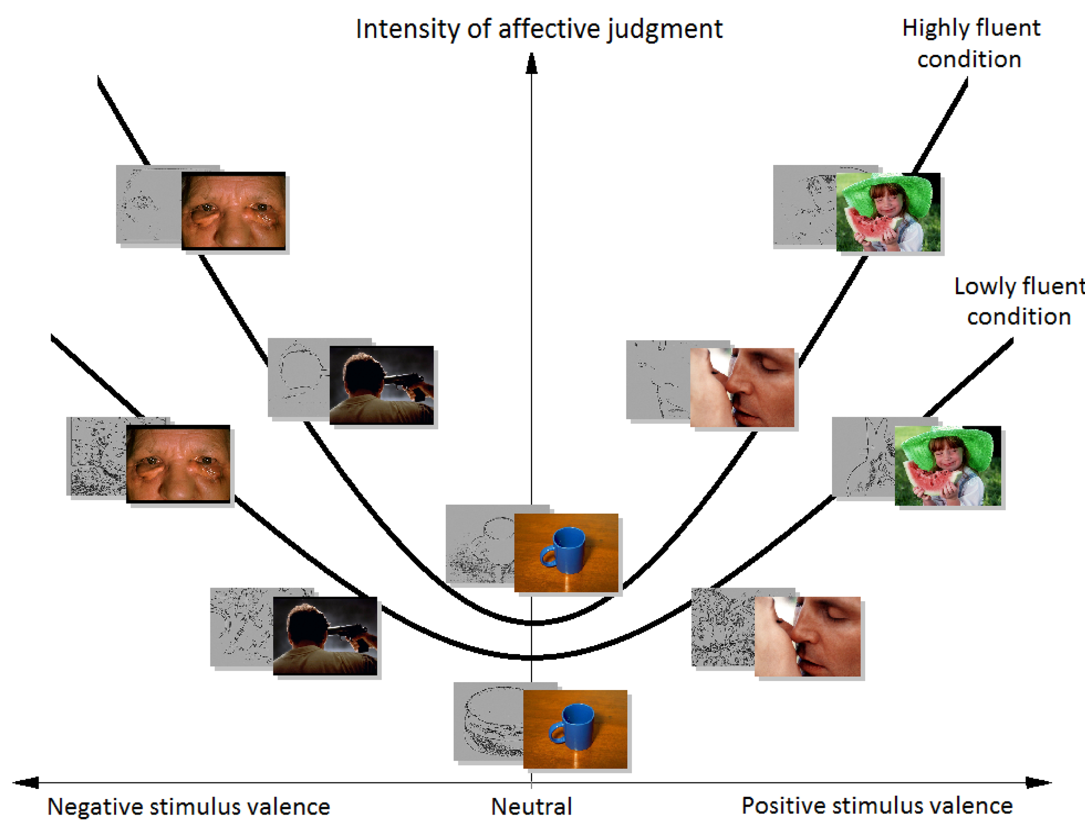

Fig. 1. Illustration of an alternative fluency model (compatible with the Fluency Attribution Hypothesis by Jacoby, et al, 1989). Targets and primes are shown in the highly fluent (prime=target) and the lowly fluent (prime≠target) condition. Expected intensity of affective judgments is shown.

In the lowly fluent condition, primes were assigned to targets in random order. In consequence, (1) perceptual and affectively different prime-target combinations and (2) perceptual different but affectively related prime-target combinations were shown. To explore the impact of the not only perceptual, but also affective differences of prime and target on liking, ratings were analyzed for each group (1) and (2) separately. Results are shown in Table 1.

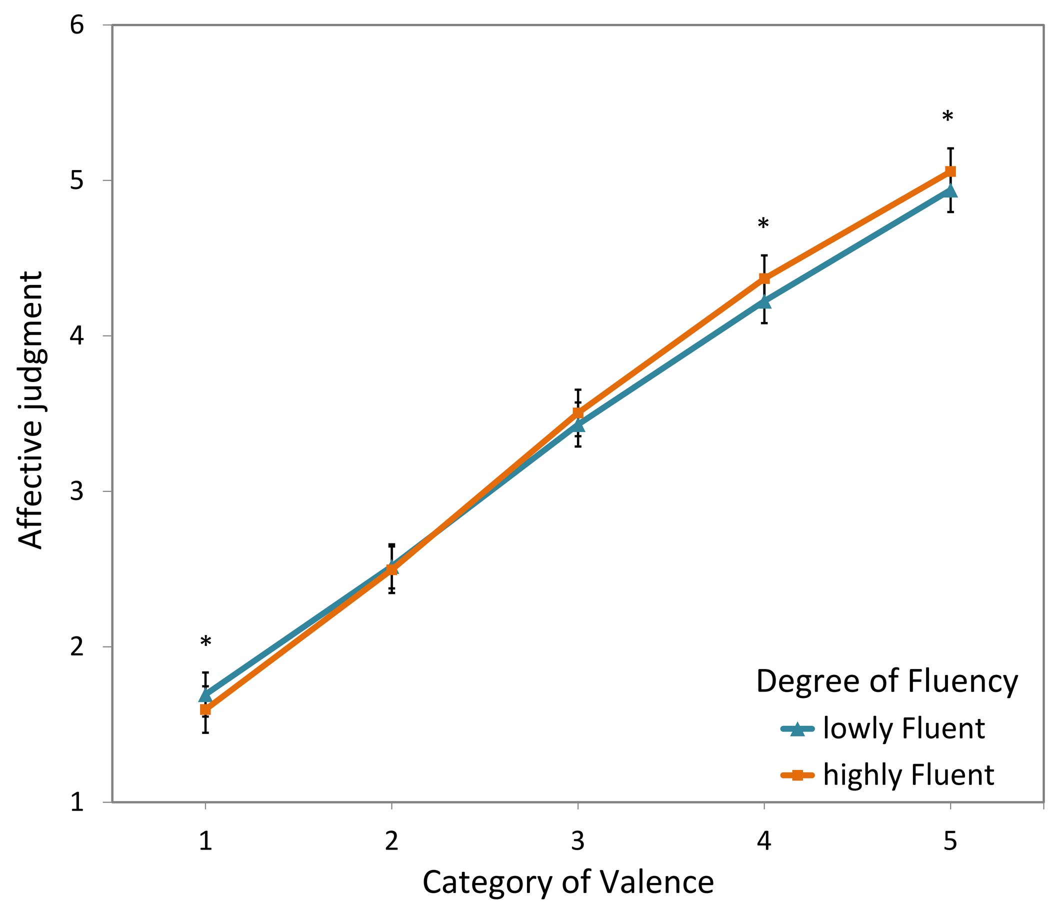

Fig. 2. Affective judgments in the highly fluent vs. lowly fluent condition, depending on the category of valence. Error bars represent standard errors.

Discussion

The present study tested the predictions of the Hedonic Fluency Model (Winkielman et al., 2003). In addition to already published study, the model was tested not only by using affectively neutral/mild positive stimulus material. Moreover, we systematically tested the impact of fluency on liking using stimulus material with a wide range of valence. In accord with the literature, we were able to validate the established Hedonic Fluency Model (Winkielman et al., 2003) for stimuli with positive valences, and only for these stimuli. Valid testing of the model, however, is only possible by balancing the valence of the stimulus material. Considering this, results for the negative stimuli contradicted the predictions of the Hedonic Fluency Model (Winkielman et al., 2003) but can be interpreted in terms of the Fluency Attribution Hypothesis (Jacoby, et al., 1989). Figure 1 illustrates an alternative formulation of a fluency model, with fluency influencing the intensity of affective judgments, both in positive and in negative direction, depending on the stimulus' valence. Fluency itself in consequence is hypothesized to be affective neutral.

Of particular importance for the advancement of theory was the separate analysis of perceptual vs. affective fluency manipulation. To change affective evaluations via fluency it seems relevant to manipulate both the affective and the perceptual dimension, maybe to create an unexpected "disfluency". So the present experiment maybe demonstrated semantic fluency effects on affective judgments instead of perceptual fluency effects, because the manipulation of the affective dimension seems to be crucial for producing fluency-based changes in affective judgments. Further research is needed to clarify the nature of fluency and specify the conditions under which fluency has an impact on (affective) judgments.

Table 1. Results by analyzed variable for overall affective ratings and separated by type of prime in the lowly fluent condition (highly fluent condition: prime=target).

analyzed variable	overall	primes in the lowly fluent condition: perceptual different, affectively different	primes in the lowly fluent condition: perceptual different, affectively related
degree of fluency	$F(1,55) = 3.16$, $p = .081$, *n.s.*	$F(1,55) < 1$, $p = .34$, *n.s.*	$F(1,55) = 3.78$, $p = .057$, *n.s.*
category of valence	**$F(4,55) = 88.50$, $p < .0001$, $\eta_p^2 = .87$**	**$F(4,55) = 76.99$, $p < .0001$, $\eta_p^2 = .85$**	**$F(4,55) = 90.54$, $p < .0001$, $\eta_p^2 = .87$**
degree of fluency x category of valence	**$F(4,55) = 3.34$, $p = .016$, $\eta_p^2 = .20$**	**$F(4,55) = 3.73$, $p = .009$, $\eta_p^2 = .21$**	$F(4,55) < 1$, $p = .830$, *n.s.*

References

- Griffiths, O., & Mitchell, C. J. (2008). Negative priming reduces affective ratings. *Cognition & Emotion, 22*(6), 1119-1129.
- Jacoby, L. L., Kelley, C. M., & Dywan, J. (1989). Memory attributions. In H. L. Roediger & F. I. M. Craik (Eds.), *Varieties of memory and consciousness: Essays in honour of Endel Tulving* (pp. 391- 422). Hillsdale, NJ: Erlbaum.
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (2005). *International affective picture system (IAPS): Affective ratings of pictures and instruction manual*. Gainesville, FL: University of Florida.
- Reber, R., Schwarz, N., & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review, 8*(4), 364-382.
- Reber, R., Winkielman, P., & Schwarz, N. (1998). Effects of perceptual fluency on affective judgments. *Psychological Science, 9*(1), 45-48.
- Winkielman, P., & Cacioppo, J. T. (2001). Mind at ease puts a smile on the face: Psychophysiological evidence that processing facilitation elicits positive affect. *Journal of Personality and Social Psychology, 81*(6), 989-1000.
- Winkielman, P., Halberstadt, J., Fazendeiro, T., & Catty, S. (2006). Prototypes are attractive because they are easy on the mind. *Psychological Science, 17*(9), 799-806.
- Winkielman, P., Schwarz, N., Fazendeiro, T. A., & Reber, R. (2003). The hedonic marking of processing fluency: Implications for evaluative judgment. In J. Musch & K. C. Klauer (Eds.), *The psychology of evaluation: Affective processes in cognition and emotion* (pp. 195-226). Mahwah, NJ: Lawrence Erlbaum.

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