Caricature valence: The effects of eyebrow diagonality and cartoonization of negative-affect facial image stimuli on valence perception

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Background

Caricaturization: "grotesque or ludicrous representation of persons or things by exaggeration of their most characteristic…features."[1]
→ technique used in (negative-affect) political cartoons.[2]

1 **IV1**: Eyebrow diagonality

- Eyebrows = exaggerated feature in caricaturized faces[3]
- Diagonality = "furrow" of the eyebrows[4]

2 **IV2**: Cartoonization

- Caricaturized faces are typically rendered as cartoons
  - Not usually photorealistic

Outcome measure: perceived ⊖ / ⊕ emotional valence of stimuli.[5]

H_1 (alternative hypothesis): **Eyebrow diagonality** and **cartoonization** of *negative-affect human face stimuli* will have main effects and interaction effects on **valence** perception.

Methodology

Participants: *Amazon MTurk* workers (n = 100).

Apparatus: Internet-connected computer with web browser.

Study Design:

- Within-participant, 2×2 study design
- **IV1 levels**: control, eyebrow manipulation; **IV2 levels**: realistic, cartoon; 4 conditions (5 stimulus images per condition).[6]
- 20 filler images + 20 stimuli = 40 trials (interspersed)
- **Each trial** = image + slider scale presentation; participants responded with perceived valence ratings.

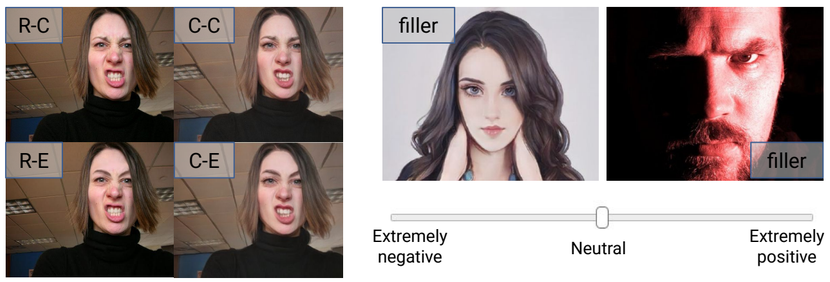


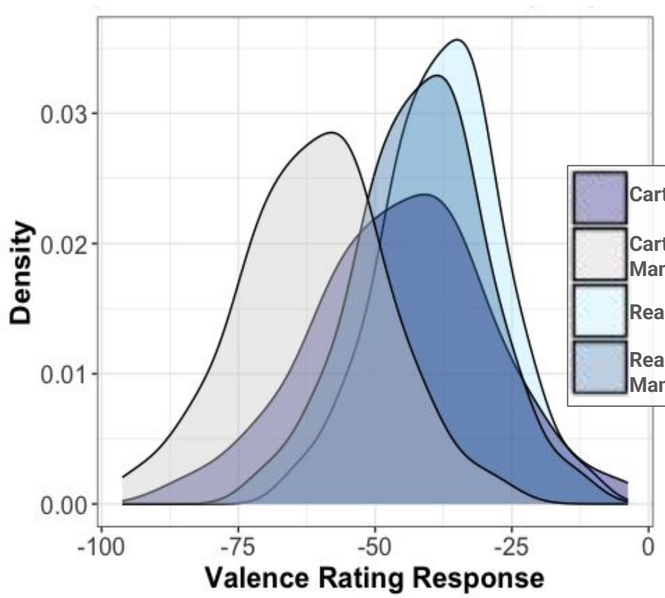
Figure 1. Stimuli and filler images, and slider scale (for valence ratings).

Results

Figure 2. Density distributions for valence ratings, by condition (simulated data using *rnorm()* in R).

DESCRIPTIVE STATISTICS:

- **Realistic-Control**: $\bar{x} \approx -37.69$; $s \approx 10.78$
- **Cartoon-Control**: $\bar{x} \approx -45.04$; $s \approx 16.17$
- **Realistic-Eyebrow Manipulation**: $\bar{x} \approx -41.58$; $s \approx 11.68$
- **Cartoon-Eyebrow Manipulation**: $\bar{x} \approx -61.37$; $s \approx 13.47$



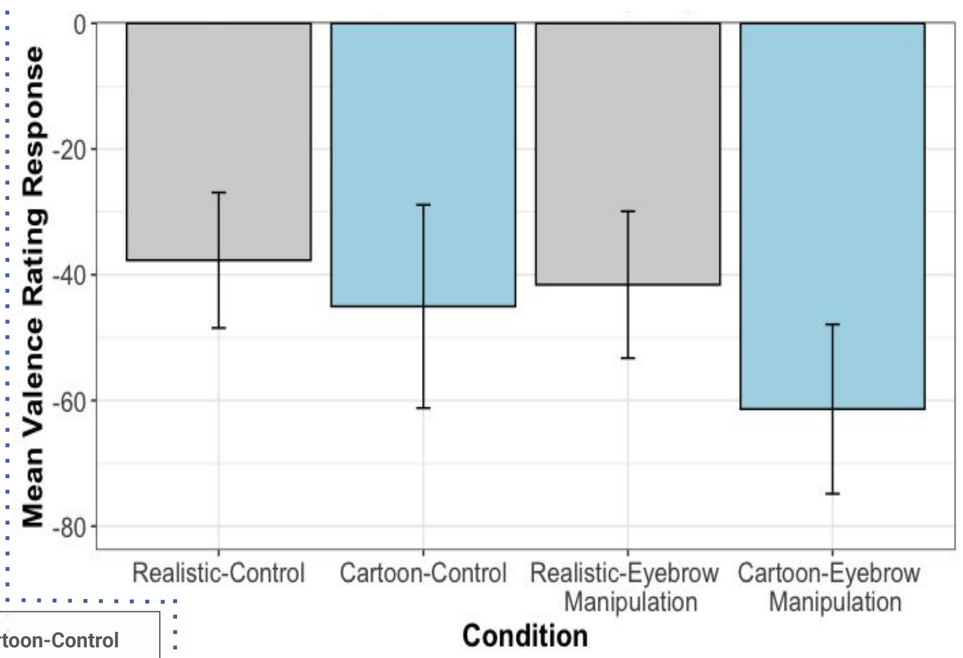


Figure 3. Bar plot depicting mean participant valence ratings, by condition (to accompany the statistically significant rmANOVA results). Displayed error bars indicate the standard deviation (s) for each condition.

rmANOVA RESULTS:

- **Diagonality**: $F(1, 99) \approx 12666.63$, $p \approx 2.75 \times 10^{-106}$, $\alpha = .05$, $\eta^2 G \approx .13$
- **Cartoonization:** $F(1, 99) \approx 1425.41$, $p \approx 1.37 \times 10^{-60}$, $\alpha = .05$, $\eta^2 G \approx .21$
- **Interaction**: $F(1, 99) \approx 1198.02$, $p \approx 4.10 \times 10^{-57}$, $\alpha = .05$, $\eta^2 G \approx .05$

Discussion

- Results from the rmANOVA and post-hoc Fisher's LSD tests show statistically significant and meaningful differences between conditions.
- Thus, eyebrow diagonality and cartoonization of negative-affect human face stimuli have main effects on valence perception, as well as interaction effects (H_1 accepted).

Implications:

- Caricaturists should carefully consider the ethics surrounding their works' messages.
  - Key aspects of caricaturization significantly impacted valence perception, which—when coupled with certain messages—can make political cartoons and caricaturized works highly influential.

References