Does familiarity increase the perceived sharpness of an object?

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Background

Previous studies show that perceived contrast and spatial frequency are higher for attended stimuli [1 2].

- Do objects appear sharper when they are expected?
  Familiarity is accessed early in perception, even before figure-ground assignment occurs [3].

- Do familiar objects appear sharper than novel objects?

Hypothesized Results

Blurry objects will violate predictions for appearance, producing an error signal. Modulating this error signal by priming or familiarity will result in a sharpened percept.

- Priming: Expectation will cause Test Lamp to appear sharper than Standard.
- Familiarity: In both standard & test conditions, Lamp will appear sharper than Novel

Experiment 1

Effect of familiarity; No effect of priming

Data for when Lamp and PR were test objects (hence, varied in blur)
Averaged over priming conditions

Lamp perceived sharper than Novel object, p < .001, n = 21

*** Results are response bias free

Experiment 2

Same as Exp 1, except without priming to assure effect was not influenced by word primes

Lamp again perceived sharper than Novel object, p < .0001, n = 30

Experiments 1 and 2 Summary

No effect of prime-mediated expectations
- Perhaps stimulus wasn’t good match to memory activated by primes
- Perhaps primes weren’t sufficiently predictive (16.6% match)

Familiarity effect
- Predictions from object memories activated by lamp interact w/ input
- Memories represent norm of previously seen lamps
- Norm tends to be sharper than experimental stimuli

Is Familiarity effect mediated by attention?
- No evidence that familiar objects automatically attract attention [4]

Strategy effect?
- Object memory-based predictions affect appearance:
  - Object memories accessed by input, not a priori
  - Recurrent processes result in sharpening

Our perception is not always an exact representation of the external world. How we perceive objects can be influenced by priors.

Experiment 3 (in progress)

To test if results generalize, we used two new sets of stimuli.

References


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