The Mirror Effect within Perception: Not another Recognition Memory Study

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Introduction: A memory phenomenon?

Signal detection theory has been applied to Recognition Memory studies to describe subjects' ability to discriminate between stimuli that have been presented before from a new set of stimuli (Wixted, 2007). When comparing subjects' performance between two classes of stimuli, one being more easily recognized (A) than the other (B), the response patterns obtained show that the difference in their discriminability is reflected in the identification of both target and lure stimuli, suggesting that stimuli distributions involved move along the decision axis leading to its identification as the Mirror Effect, (Glanzer, Adams, Kim, 1993).

Evidence in favor of the Mirror Effect has been reported across different SDT-alike procedures. In typical Yes/No tasks, the Mirror Effect appears as:

$$FalseAlarms(A) < FalseAlarms(B) < Hits(B) < Hits(A) \quad (1)$$

When participants are asked to valuate how confident they felt while answering to each trial:

$$R(AN) < R(BN) < R(BS) < R(AS) \quad (2)$$

However, the Mirror Effect has only been studied within Recognition Memory and so, most theories and models proposed to explain it tend to do it in terms of high-level processes engaged in the study phase, (DeCarlo, 2007, Glanzer et. al, 1993). The main goal of the present study was to explore the existence of the Mirror Effect outside Recognition Memory, testing these assumptions.

Method: A perceptual task

Two levels of perceptual discriminability constructed according to the literature on the Ebbinghaus illusion, (Massaro, 1971).

- High accuracy (A): Ebbinghaus illusions with 2 or 3 surrounding circles.
- Low accuracy (B): Ebbinghaus illusions with 7 or 8 surrounding circles.

Detection task: Are the two central circles of the same size?
Confidence Rate Task: On a scale from 1 to 3, how confident are you of your response?
Two experiments:

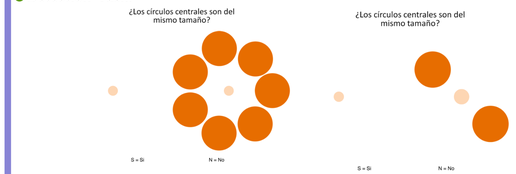
- Experiment 1: Just the right circle to compare is shown part of an Ebbinghaus illusion.
- Experiment 2: Both circles were constructed as Ebbinghaus illusions.

Technical details:

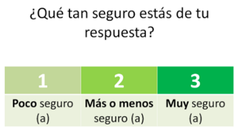
- 640 trials (total)
- 40 different stimuli, (10 repetitions, at least)
- Over and Underestimation trials
- 1.5 s exposure
- Space-bar between trials

Procedure: The actual task

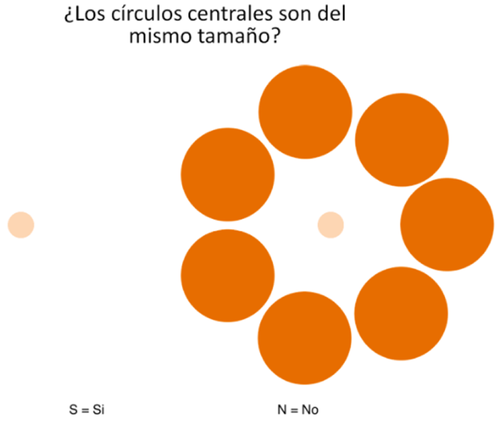
1. Detection Task:



2. Confidence Rating



Classical Analysis!



What did we find? (Spoiler alert!)

In both experiments, the pattern of responses identified as the Mirror Effect was found on at least 85% of the participants.

Bayesian Modeling

In both experiments, the pattern of responses identified as the Mirror Effect was found on at least 85% of the participants.

Classical Data Analysis

Nam quis odio enim, in molestie libero. Vivamus cursus mi at nulla elementum sollicitudin. Nam quis odio enim, in molestie libero. Vivamus cursus mi at nulla elementum sollicitudin.

$$\kappa = \frac{\xi}{E_{\max}} \quad (3)$$

Results

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Tabela: Table caption

Conclusion

The present study is the first to show evidence for the existence of the Mirror Effect patterns of response, on a signal detection task that does not involve recognition memory. The perceptual task here presented lacked of a pre-experimental phase where participants had the chance to manipulate how powerful the illusions included in each condition were, contradicting what has been proposed within recognition memory studies. The fact that the Mirror Effect was found on a perceptual task, with accuracy conditions designed specifically in terms of the signal that participants are asked to detect, may suggest that there's a much more basic principle regulating the patterns of response observed.

Additional Information

Maecenas ultricies feugiat velit non mattis. Fusce tempus arcu id ligula varius dictum.

- Curabitur pellentesque dignissim
- Eu facilisis est tempus quis
- Duis porta consequat lorem

References

S = Si N = No

Acknowledgements

First of all,

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