Priming, Perception, and the Phenomena of Amiguous Figures

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Abstract

Ambiguous figures are images in which multiple interpretations of the image can be perceived without alteration of the physical properties of the image. The ambiguity around this phenomenon led our research team to conduct a study comparing the relationship between the priming effect and image perception. We hypothesized that participants would be more likely to perceive the image within the ambiguous figure that color-coordinates with the color shown during the priming phase of the study. For this study, participants were shown a 3-minute video depicting the color white or the color black. They were then shown 5 ambiguous figures and asked which image within the figure they saw first. There was not enough evidence to support our hypothesis or conclude that there was a significant relationship between the priming effect and the color of the image perceived first.

Introduction

- Ambiguous figures are images in which two distinct percepts occur simultaneously without alteration of the physical properties of the image.
- These figures have played a crucial role in the support and development of theories on visual perception from the 1900s Gestalt movement to the cognitive revolution of the 1960s, and are utilized in nearly every discipline of modern psychology (Wimmer 2011).
- Researchers have historically been, and continue to be, torn on the specific processes and memory mechanisms that contribute to the phenomenal experience of reversal (Gestalt switching) (Macpherson 2006).
- With the ambiguity around this phenomenon and the surplus of implications for further research of Gestalt switches and ambiguous figures, we decided to introduce the element of priming into the equation.
- Priming is considered a perceptual representation system (PRS) that is nonconscious, involves implicit memory, and works on a pre-semantic level (Tulving 1990).

Method

Participants

- The participants were sourced from the Psychology Department at the University of Oklahoma.
- The participants included 14 individuals between the ages of 19-24 years (2 male and 12 female)

Materials

- Two 3-minute videos depicting 15 images (30 images total)
- Five black and white ambiguous figures
- Qualtrics XM online survey software
- Jasp statistical analysis software

Procedures

- Participants were randomly assigned to one of two groups. Both groups were shown a nearly identical, video depicting a slideshow of 15 color-coordinating images. Group 1 was shown a slideshow depicting the color white while Group 2 was shown a slideshow focusing on the color black.
- The color of the images in the slideshow acted as our independent variable.
- Participants were shown an ambiguous image and then asked which of the two figures within the ambiguous image they perceived first.
- The color of the image (white or black) first recognized from the ambiguous figure acted as our dependent variable.
- This process was repeated until the participants had seen and responded to five total ambiguous images.
- Responses were coded so that a perceived white figure received a score of 1, a perceived black figure received a score of -1, and no response received a score of 0 (as to not affect the average). The scores of each participant were averaged to depict whether they perceived more white or black figures within the ambiguous images.

Data

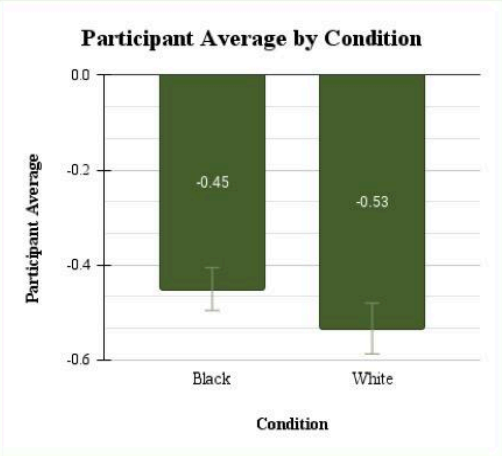

Figure 1. A visualization of the relationship between the group condition and the average score received by participants.

Condition	*N*	*M*	*SD*	*SE*
Group 1 (White)	6	-0.533	0.278	0.098
Group 2 (Black)	8	-0.45	0.45	0.184

Results

- Researchers hypothesized that priming the participants with a specific color (black or white) would influence their perception of an ambiguous figure in that the participant would be more likely to perceive the image that color coordinates with that shown during the priming phase of the study.
- An independent samples T-test was conducted to evaluate the relationship between the priming effect and the color of image perception. There was not enough evidence to conclude that there was a significant relationship between the two, as Group 1 ($M = -0.53$, $SD = 0.45$) scored roughly the same as Group 2 ($M = -0.45$, $SD = 0.28$), $t(12) = 0.43$, $p = .66$, $d = 0.23$.
- Researchers accepted the null hypothesis

Discussion

Conclusions

Although our study did not yield significant results, ambiguous figures and the effect they have on our perceptual and cognitive processes have proved incredibly fascinating. This topic has a multitude of implications for the psychological, biological, and philosophical communities and thoroughly deserves further scientific research.

Limitations

- Our small population ($N = 14$) was comprised solely of undergraduate psychology students.
- By having the video embedded in the survey, we left room for error and distraction as participants were able to see other colors, shapes, and words on their screens.

Future Research

- Utilizing different colors to prime and test with could possibly lead to more significant results.
- Administer the priming video in a controlled setting free of distraction.

References

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