

Change Detection for Shadows and Colours in Artists and Non-Artists

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Introduction

- Shadows provide us with important perceptual information such as depth, lighting, and scene layout, nevertheless they often go unnoticed and are rarely remembered (Casati & Cavanagh, 2019).
- Previous studies have shown that shadow changes are less noticeable than other changes (e.g., colour) in natural and artificial scenes (e.g., Ehinger, Allen, & Wolfe, 2016).

Are there differences in perception and noticeability of shadows between visual artists and non-artists?

- A higher level of artistic skill and training led to better performance on visual tasks, such as integration of object information (Perdreau & Cavanagh, 2013a).
- Participating in an intensive drawing training course improves several aspects of visuospatial skill such as mental rotation and attention switching (Chamberlain, Kozbelt, Drake, & Wagemans, 2021).

- Since artists often perform better on visual tasks, they may perform better on change detection compared to non-artists.
- Artists may be particularly attentive to shadows because they often reproduce them in their art.

Method

Participants

- Participants were students at Glendon College from psychology and visual arts courses.

Each participant was asked if they create visual artwork (ex. paint, draw, graphic design)?

“YES” = ARTISTS
N = 22
(19 women, 3 men)

“NO” = NON-ARTISTS
N = 19
(16 women, 1 man, 2 other)

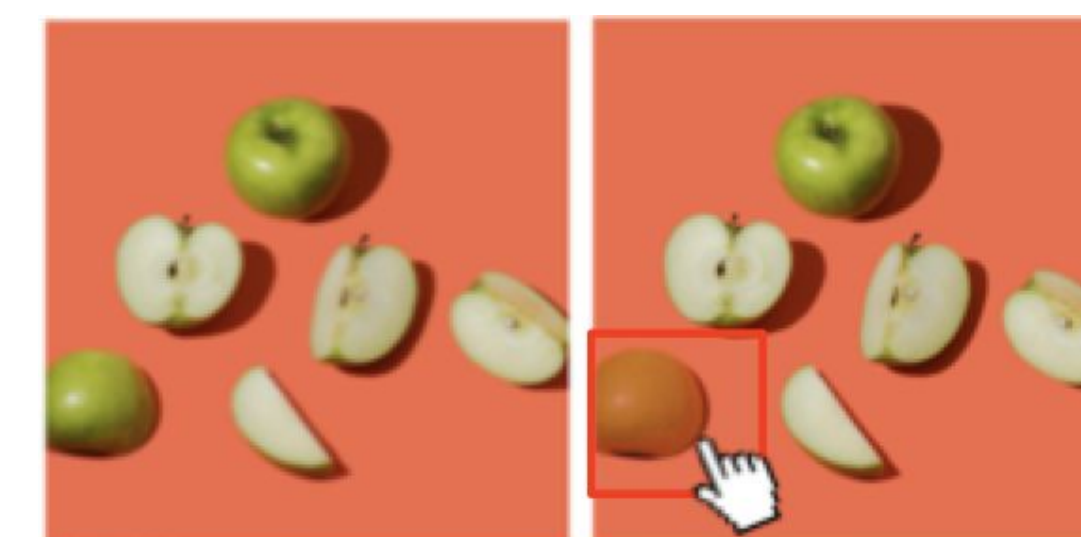
Task & Procedure

Change Detection Task

Compare the two side-by-side images
and click on the difference on the image on the right asap

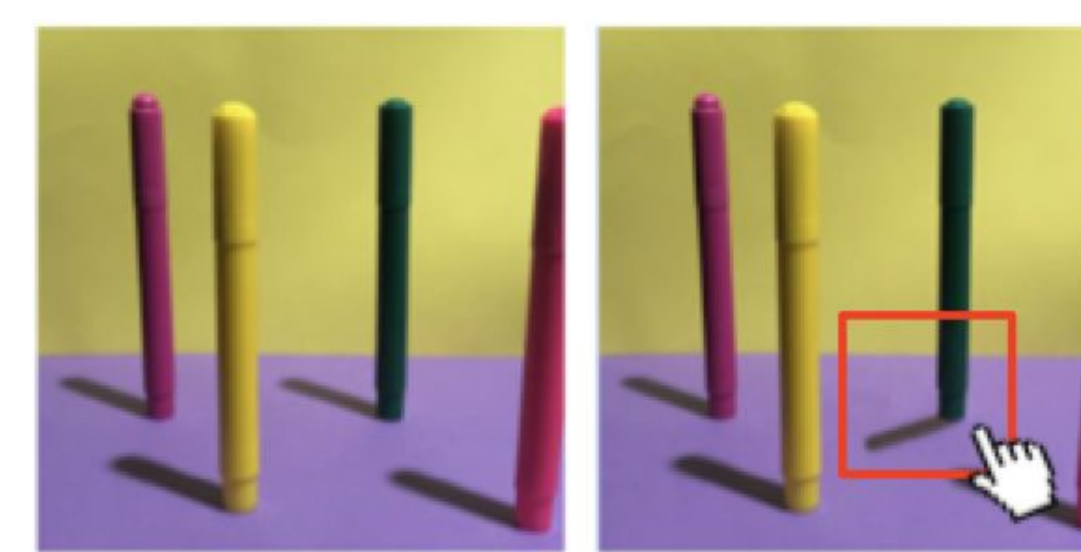
20 pairs of images: 10 with colour changes and 10 with shadow changes
– all presented in a randomized order for each participant

Example of a Colour Change



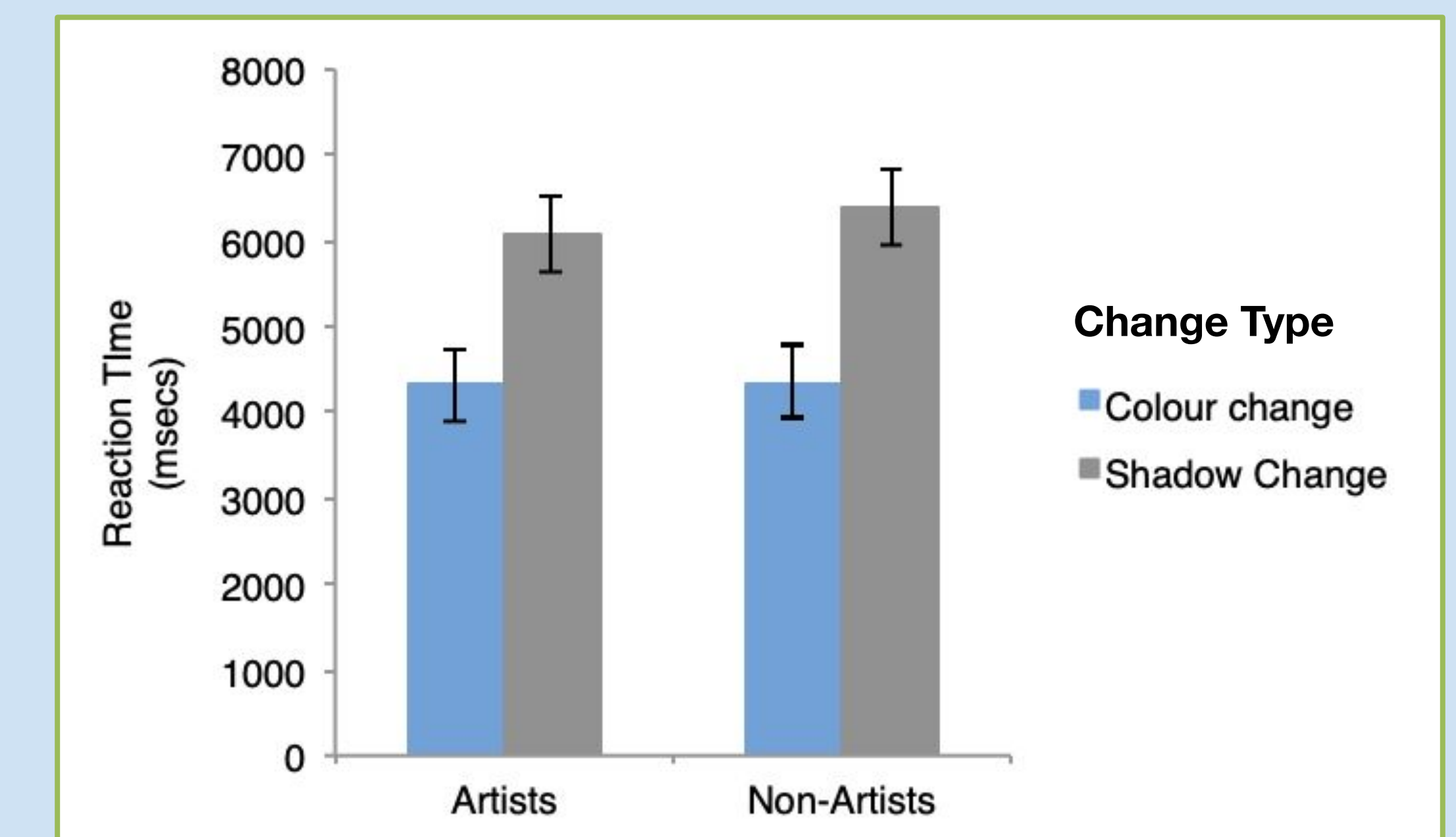
Participants clicked on the location of the change as soon as they detected it.

Example of a Shadow Change



Measure: Reaction Time for detecting the correct change

Results



- Artists' RT to detect colour changes was not different to Non-Artists' RT (M: 4315.28, SD: 1955.65 and M: 4340.97, SD: 1663.78, respectively)
- Artists' RT to detect shadow changes was not different to Non-Artists' RT (M: 6084.68, SD: 2085.39 and M: 6399.01, SD: 2325.70, respectively)

Artists and Non-Artists were faster at detecting colour changes than shadow changes [$F(1, 39) = 30.474$, $p < .001$; $\eta^2 = .44$; Power = 1.00]

Conclusions

- Shadow change detection is slower than colour change detection.
- Artists and Non-Artists do not differ in their ability to detect colour or shadow changes. Artists' perception is therefore much like that of non-artists, despite many hours of practice in drawing scenes (Perdreau & Cavanagh, 2013b). The artists' advantage is in their ability to extract structure from images (Perdreau & Cavanagh, 2013a).

References

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Scan this QR code to view a video presentation of this study

Acknowledgments

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