

**Reviews (Round 1):** Motion-driven enhancement of a lower region cue in depth perception (#8786)

**Edited by:** Yuki Yamada, Kyushu University, Japan

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**Review by:** R.J. van Lier, Radboud University, Netherlands

**For author and editor**

These are really nice demonstration of a fascinating color effect. I think this will be a perfect contribution to the journal of illusion.

I have just a few remarks that the author might wish to consider.

As acknowledged by the author, similar effects have been described earlier. Interestingly, it has also been observed in the afterimage filling-in phenomenon in which the author was involved (van Lier, Vergeer, Anstis, 2009, *Current Biology*) and a few years later also by Anstis, Vergeer, and Van Lier (Luminance contours can gate afterimage colors and “real” colors, *Journal of Vision*, 2012). In the afterimage filling in phenomenon, a colored starlike figure alternated with different outlines. It appeared that pink colors outside the subsequently presented outline, induced a pink color inside that outline (see also measurements and remarks on that in Van Lier et al. 2009). (In fact the original stimuli were designed such that the net color effect was increased by having inducing complementary colors inside and outside the subsequent outlines.) Also, Anstis et al. (2012) write: “The color inside the outlined area leads to a complementary colored afterimage. However, the color outside the outlined area also leads to an afterimage inside the outlined area, but with a color similar to its original color. The latter effect is the result of contrast induction of the afterimage across the outline (Anstis, Rogers, & Henry, 1978)”.

The effect of the inducing colors outside the outline is very much like the checkerboard display in movie 2, or the more recent color dove illusion by Barkan & Spitzer (Barkan, Y., and Spitzer, H. 2017, “The color dove illusion - chromatic filling in effect following a spatial-temporal edge,” in *The Oxford Compendium of Visual*

Illusions, eds A. G. Shapiro and D. Todorovic, 752–755), or, indeed, the example mentioned by the author where one “one fixates steadily on white letters in a red surround and then switches one’s gaze to a white test field, the resulting afterimage consists not of white letters on a green surround but of red letters on a white (or possibly faintly green) surround”,

Given these phenomena, there are two plausible ‘pink routes’ that could be mentioned; the complementary afterimage (green) of the inducing color (pink) induces its complementary colour (pink) at the other side of the outlines, or the already induced complementary colour (green) at the other side of the outlines (and the pink inducer) induces a complementary afterimage (which is again pink). In both cases the pink color that is enclosed by the outlines is enhanced by the outlines (Daw, 1962), and, presumably, therefore also much more visible than any intermediate greenish taint.

Please note (as a fun side remark) that the current ECVF logo (effective since January) makes use of a similar phenomenon, using various colors:  
<https://2022.ecvp.eu> (see the alternating colored ‘eye’ at the left part of the logo) ;-)

Recommendation: See Comments

Completed: 2022-06-23

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Review by: Rumi Tokunaga, Chiba University, Japan

### **For author and editor**

The author reports a counter-intuitive color phenomenon related to the simultaneous color contrast. In the report, the author discussed this phenomenon with three possible explanations, but this illusion is not resolved. I could observe the Pink illusion clearly for #1c and #2a. And it is an interesting phenomenon involving color contrast, color assimilation, afterimage, and motion perception. I believe this illusion meets the scope of the journal of illusion.

I, however, could not observe the Pink illusion on some of the patterns. I will describe my observation and comments.

Major points:

- 1) It would be helpful if you make sections.
- 2) It may be helpful to describe the observer's information about who the observation was made.
- 3) The author explained why you introduced #1b in #1 only in the figure caption. It would be helpful to readers if you explained it in the main text.

Comments for Movies (These are not a requirement for acceptance.):

Movie#1:

1) The illusion was seen or unseen when I observed Movie #1a with different monitors. So I measured the luminances at the center of Movie #1 a,b,c, and d on different monitors. They were different. When the luminance was low, say 80(cd/m<sup>2</sup>) in the lit room, I observed the Pink illusion as you describe. But when the luminance was high, 400(cd/m<sup>2</sup>), I observed the white disk and ring still appeared white while the white sectors became vivid green.

I presume there might be a relation between the strength of illusion and background luminance(the white sectors). I would like to know if there is an optimal brightness or screen brightness to perceive illusion. It may be a subject for future experimentation.

2) In addition to 1), I could see the pink illusion of Movie #1c regardless of the device. If the brightness of white sectors affects the illusion, I'd like to see the pattern where the white sectors are gray, equiluminous with red sectors.

3) Concerning 1), when I could not observe the pink illusion on #1a with the high luminance monitor, I saw the pattern as three-dimensional; the central white and ring stayed steady at the very front, and the white sectors(here, I perceived it as vivid

green), seemed to have a background space behind the rotating red sectors. I wonder if this 3D perception somehow relates to this illusion.

Movie#2:

Once I could see the illusion for #2a, I could see pale pink relatively quickly. But it does not happen for #1c. It appears pink gradually in the case of #1c. I could observe the Pink illusion in both #1c and #2a, but, I wonder if the mechanism explaining the Pink illusion is the same.

Recommendation: Revisions required

Completed: 2022-07-01

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