

Review Details: The Sunburst illusion

The first round of review

Reviewer: Stephen Macknik

The sunburst illusion phenomenon presents as a moire-like effect in the same vein as the MacKay Ray illusion, the Flickering wheel illusion, Dynamic Luminance-Gradient illusion. Indeed, although there are specific reasons to suggest that the sunburst illusion is novel, the underlying mechanisms of all of these illusions may be the same. Either way, one of the most exciting things that the authors have achieved is to show how their illusion varies as a function of relative direction to the orientation of the stimuli and as a function of pursuit vs. saccadic eye movements. The paper is well written and I frankly have no suggested requirements for publication. It's a very clear effect, with a wonderful set of demos that highlight the author's point succinctly, and its very well written manuscript.

Recommendation: Accept Submission

Reviewer: Makoto Ichikawa

Major problem:

The author claims that the phenomenon described in this paper is a new illusion. However, I could not clearly understand what the essence of the phenomenon reported in this paper is from the description in this paper. What are the necessary conditions for the reported phenomenon? In the first movie, the trajectory is in the shape of a transverse figure 8, but it seems to occur in linear motion as well. (To be honest, I did not understand the difference between the phenomenon caused by linear motion and figure-8 motion.) In addition, although the speed of the motion is described as important, there is no specific description of how much speed is required. There is no clear description of the factors that cause or enhance the illusion, so we do not know the characteristics of the phenomenon. The authors need to clarify these points.

In addition, there is no description on the basic process that causes this phenomenon in the paper. The author should explain the basis of this phenomenon.

I believe that the paper does not sufficiently describe the characteristics and details of the

illusory phenomenon presented in this paper. Therefore, I cannot recommend that this paper be adopted in its present form. I request the author to solve these problems.

Minor points:

This manuscript does not clearly describe the graphical properties of the illusory figures. Even if the phenomenon is produced by the same figure as the stimuli presented in the previous study, it is necessary to describe the graphical characteristics of the illusion (e.g., the number of radially arranged fans in the moving image for demonstration, the size of the central angle, the size of the fan in the appropriate visual field, the width and height of the figure 8 to induce eye movement, the distance and speed of linear motion, etc.) should be described in detail.

In the 4th demonstration movie, the color of the background is changed, but what is the purpose of this operation? If the author wants to show the effect of the level of luminance difference on the illusory phenomenon, the author should draw the image in different levels of achromatic grayscale?

Recommendation: Revisions Required

The second round of review

Reviewer: Makoto Ichikawa

Major problem:

I found that most of the problems I pointed out with the previous version have been adequately resolved. The discussion of the figure-8 trajectory, whose effects were not clear, has been removed, making the paper much easier to understand. I think the change in structure from explaining the phenomena in the first half of the paper to discussing the factors affecting the phenomena in the second half was also successful.

However, there are still some points that I do not understand in the discussion of basic processes. In p8, L14, the author describes "As suggested above, it is possible that the basic mechanism producing the dazzling impression is shared by the Scintillating-luster effect, the Flickering wheel illusion and the Sunburst illusion." Nevertheless, I cannot find this suggestion. Where, the author discussed the Scintillating-luster effect, the Flickering wheel illusion and the Sunburst illusion may share basic mechanisms. I think this is a very important

point. In particular, I would like to see a proper discussion of what the Flickering wheel illusion and the Sunburst illusion have in common and what they do not, since they are caused by the same observation of the figure.

Minor point:

Figure 5 shows figures with different hues. However, from the explanation, it seems that the hue does not affect the strength of the illusory phenomenon, but the luminance difference between the elements is the important factor for the phenomenon. If this is the case, it would be better to show not only the colored version as Figure 5, but also the achromatic version with similar luminance differences to the colored version, so that readers can compare the illusory phenomenon among them.

Recommendation: Revisions Required

The third round of review

Reviewer: Makoto Ichikawa

Recommendation: Accept Submission