Reviews: Faces behind bars: illusory eye movements induced by gratings (#8005)

Edited by: Dejan Todorović, University of Belgrade, Serbia

Review by: Takahiro Kawabe, NTT Communication Science Laboratories, Japan

For author and editor

This manuscript reports several exciting and novel illusions created by presenting a moving grating in front of a stationary object. Some of the phenomena reported by the author are considered to be illusions similar to Anstis' footstep illusion and Howe's inverted footsteps illusion, as the author admits. On the other hand, such previous studies have not reported motion illusion for static objects that apparently move orthogonally to the direction of grating motion. The illusory motion orthogonal to the direction of the grating is possibly ascribed to the orientation components of the edge of the eyes behind the moving grating. Although the parametric aspect of the edge orientation component has not been systematically controlled, the phenomenon described in this paper is an important one for inviting parametric studies in the future. From this point of view, I believe that this paper meets the scope of the Journal of Illusion and is eligible for acceptance.

<Minor point>

1. I couldn't figure out which file corresponds to which movie, so it would be helpful if the author renames the movie files when uploading the revised manuscript.

2. This is not a requirement for acceptance, but it would be even better if there is a demonstration showing how manipulating the direction of the edge of the eye, for example, by using a horizontal black eye or a vertical black eye, changes the direction of the perceived motion.

Recommendation: Revisions Required

Completed: 2021-09-08 08:02 PM

Review by: Akiyoshi Kitaoka, Ritsumeikan University, Japan

For author and editor

Comments to “Faces behind bars: Illusory eye movements induced by gratings” (#8005) written by Benjamin Balas

This paper reports a motion illusion like the barrier grid animation. The difference between them is that the latter is one of the ordinary animation techniques using apparent movement consisting of several frames of different images, while the former uses a single image. This motion illusion is new and shows amazing effects, and I think it deserves a paper in the Journal of Illusion.

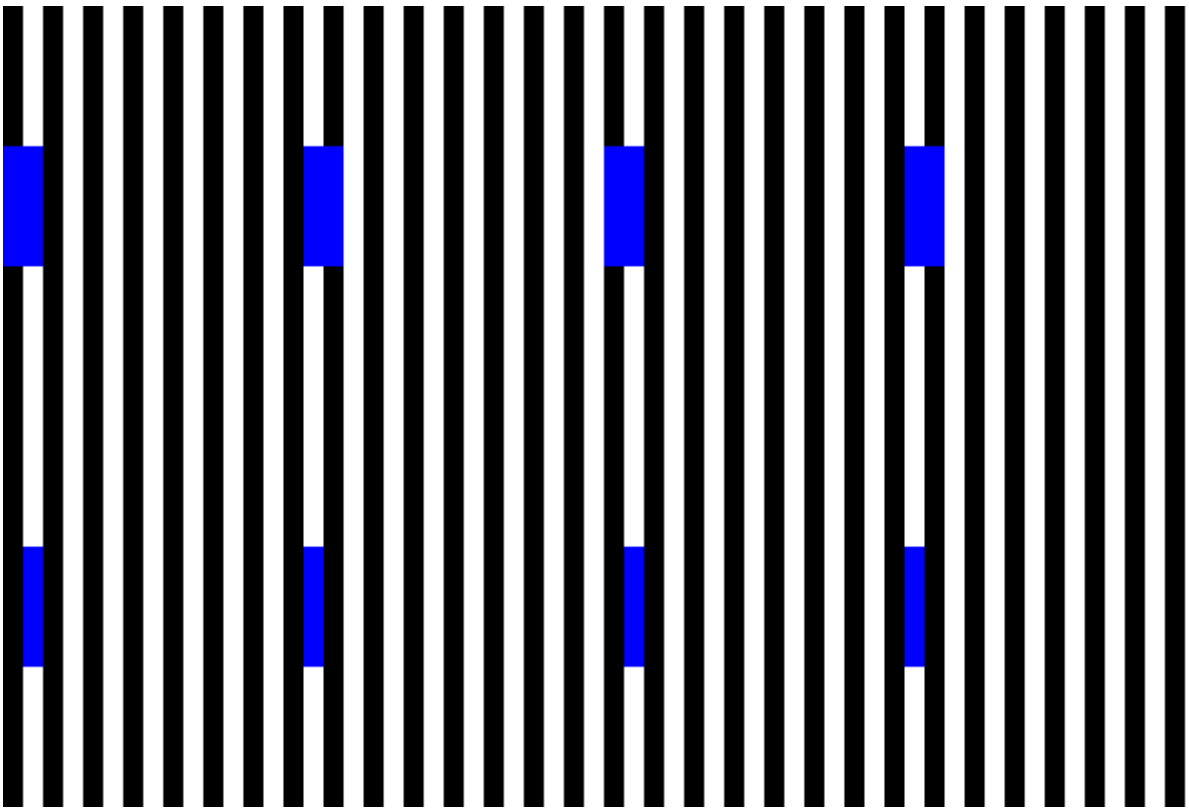
Some people may think that this motion illusion is a kind of apparent movement, and that it is not new. Even if this motion illusion is based upon apparent movement, the demonstration that the eyes of a person appear to move when a barrier grid is moved over a single still image is quite novel and amazing and fits the scope of the Journal of Illusion.

The author considered this illusion as a kind of moiré perception. He also pointed out the similarity to the footsteps illusion. I have never studied the relationship between the footsteps illusion and the barrier grid animation before, so I took this opportunity to examine it. In the footsteps illusion, the target (rectangle) moves over stationary stripes. Moreover, in the barrier grid animation and the motion illusion of this paper, the target is stationary, and the stripes move over it. So, there are two differences between the conditions of the footsteps illusion and the motion illusion in this paper: one is whether the moving object is the target or the stripes, and the other is whether the target is in front of the stripes or the latter are in front of the former.

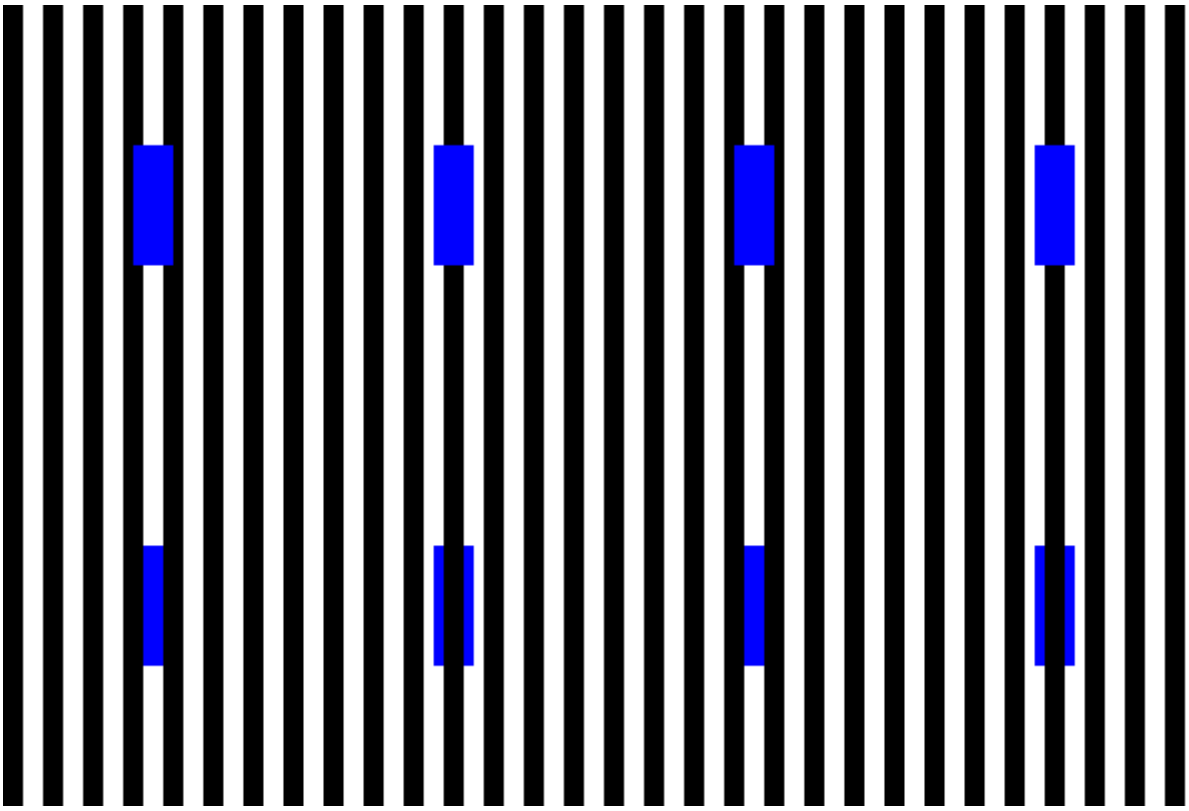
The upper half of Movie A shows an example of the footsteps illusion. Rectangles appear to speed up or slow down, though they move rightward at a constant speed over stationary stripes. The lower half of Movie B shows an example corresponding to the motion illusion of this paper. The stripes move rightward at a constant speed over stationary rectangles, but the rectangles appear to move laterally back and forth.

What do the lower half of Movie A and the upper half of Movie B correspond to? In the former case, rectangles appear to move like the footsteps illusion. To the best of my knowledge, this phenomenon has not been reported in any papers in visual science. When the left and right edges of a moving rectangle are hidden behind stripes, one would think that it should appear to stop, since there is no cue for motion perception. Maybe that's why it never attracted any attention. Or, even if the phenomenon had been submitted to a journal, it might not have been accepted. However, if you observe Movie A, you will notice that this phenomenon is very similar to the footsteps illusion.

On the other hand, the upper half of Movie B is an example of the inverted footsteps illusion, which was first proposed by Howe et al. (2006) and revisited by Kitaoka and Anstis (2021). This illusion is very similar to the motion illusion of this paper.



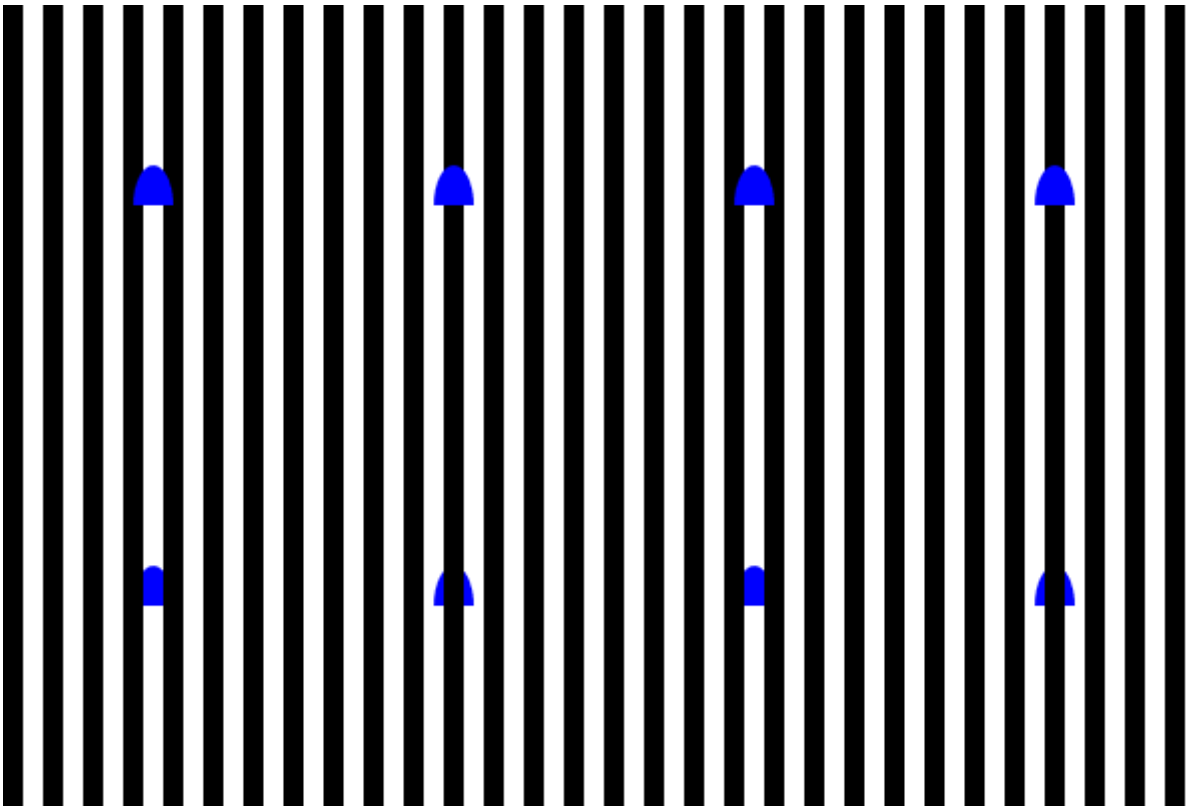
Movie A



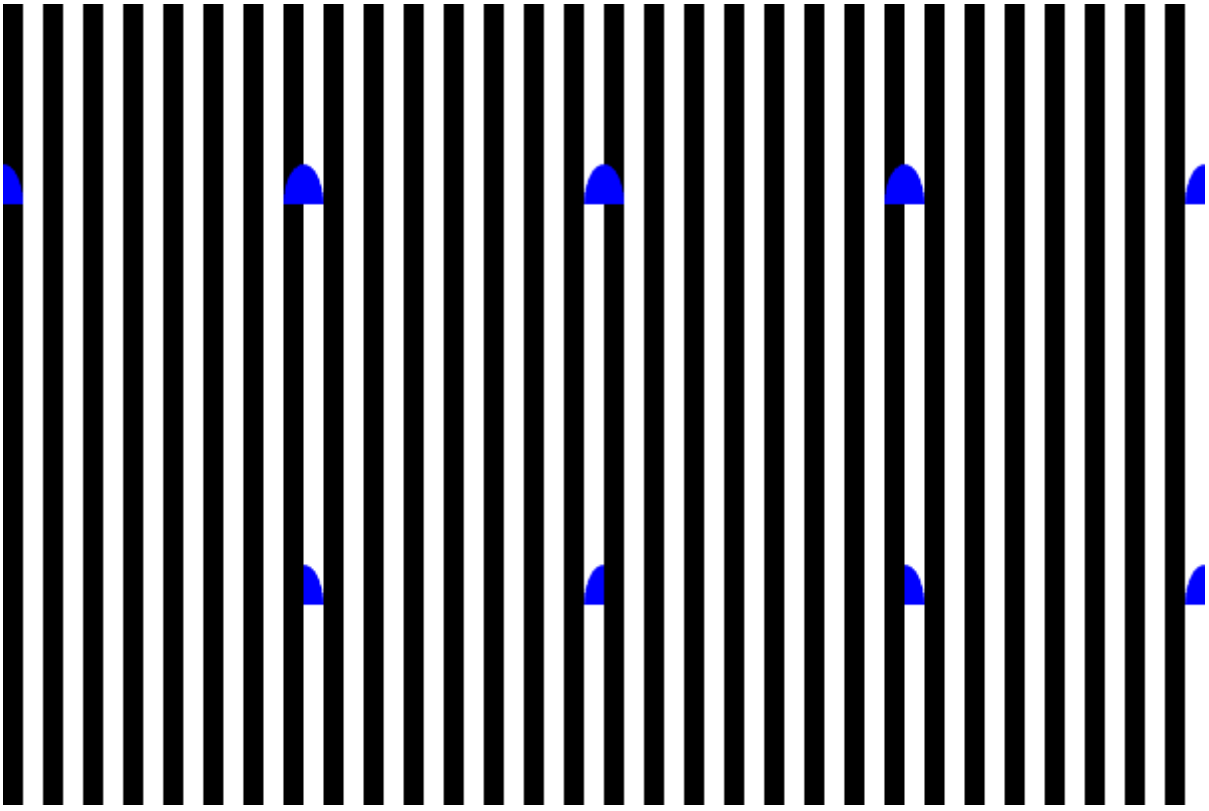
Movie B

These observations suggest that the motion illusion in this paper is highly related to the footsteps illusion. In other words, publishing this motion illusion in the Journal of Illusion will be useful for future research on motion perception.

The author noted that “the swirling and vertical eye movements we describe here are not evident in variants of the footsteps illusion without changing the orientation of the grating” (p. 7). These phenomena are also novel and amazing. I checked whether the swirling effect is also observed in the footsteps illusion. The lower half of Movie C is a reproduction of the swirling effect in the motion illusion of this paper. On the other hand, the upper half of Movie C confirms that the swirling effect is also observed in the inverted footsteps illusion. Moreover, the upper half of Movie D shows that the swirling effect is observed in the footsteps illusion.

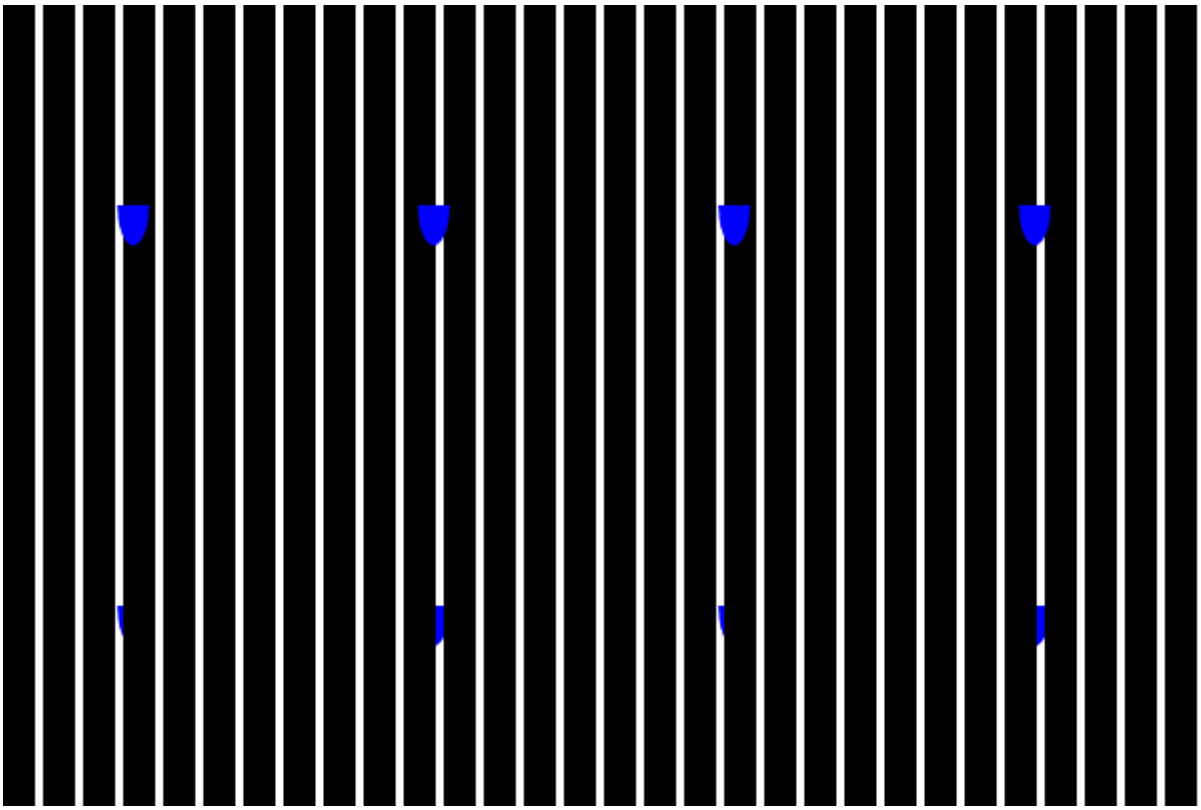


Movie C

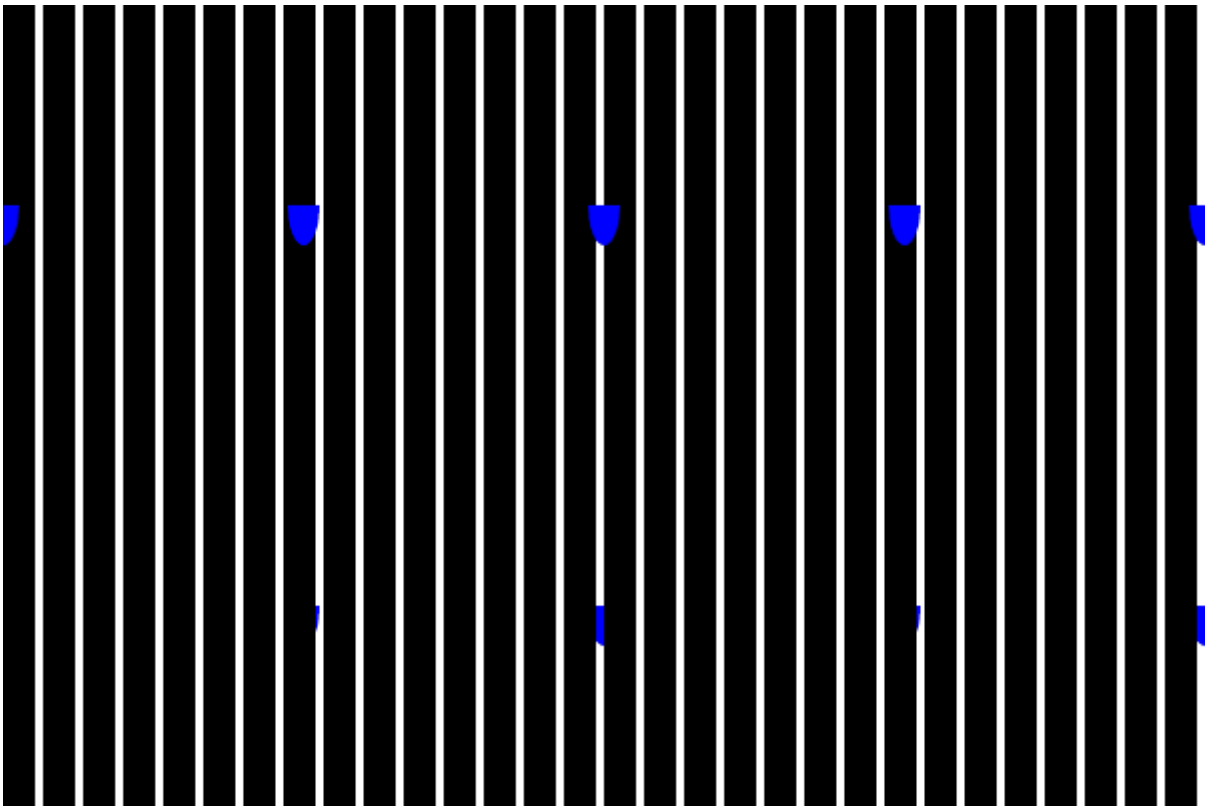


Movie D

Moreover, the vertical eye movements effect is also observed in the footsteps illusion and inverted footsteps illusion. The lower half of Movie E is a reproduction of it in the motion illusion of this paper. The upper half of Movie E is a demonstration of the vertical effect in the inverted footsteps illusion. The upper half of Movie F shows that the vertical effect is observed in the footsteps illusion.



Movie E



Movie F

These observations also suggest that the motion illusion in this paper is not a kind of apparent movement, but an illusion related to the footsteps illusion. However, I respect that the author considers this phenomenon as a kind of moiré perception, because the Journal of Illusion is a medium for reporting new phenomena, not for pursuing the mechanisms of the phenomena as its main purpose.

The following is a list of minor points.

My concern is that the word "pupil" is used to refer to the pupil + iris. In everyday English, though, the word "pupil" might refer to them.

There is some fluctuation in the wording: p.5 says “picket-fence,” and p.8 says “barrier-grid.”

Recommendation: Revisions Required

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