



Letter to the editor

The novelty of the “Accordion Grating Illusion”

In a recent letter to the Editor of *Neural Networks*, Altschuler (2012) claimed that the “Accordion Grating Illusion” (AGI), the main topic of two recent papers (Gori, Giora, Yazdanbakhsh, & Mingolla, 2011; Yazdanbakhsh & Gori, 2011), was already described by Foster and Altschuler (2001) under the name “Bulging Grid Illusion”.

Gori et al. (2011, p. 1087) referred to the Bulging Grid Illusion as a phenomenon similar to the AGI, but reported that the Accordion Grating pattern produced, simultaneously, two illusory effects: (i) an expansion in a direction perpendicular to the stripes, and (ii) a perceived curvature of the stripes. Gori et al. presented careful measurements and theoretical analyses of both illusory expansion and curvature, as well as the mechanistic underpinnings that engender only one or the other effect for certain stimuli. Foster and Altschuler (2001) made no mention of phenomenological expansion. To the extent that the word “bulging” can be said to connote a local expansion of a region, such an expansion could not be disentangled from an equally connoted increase in curvature, whereas the AGI permits exactly such a distinction.

Altschuler’s (2012) claim for priority cites a sentence from Foster and Altschuler (2001, p. 394) referring to two parallel lines that appear to bow outward. No figure displaying two parallel lines appears. In Euclidean plane geometry, an infinite number of curves, including a straight line, can pass through two points. A similar indeterminacy underlies the distinction between curvature and expansion. A stimulus with only two parallel lines cannot “settle” the question of whether expansion and curvature are two manifestations of the same perceptual phenomenon or whether they are distinct; hence the need to replicate parallel lines into an “grating” pattern.

The similarities between the Bulging Grid Illusion and the AGI, investigated and discussed in our previous papers, are thus exclusively related to the single illusory effect of curvature. The expansion in a direction perpendicular to the stripes has not been described before.

Although we cited and reflected on the Bulging Grid in our two earlier papers, the AGI presents illusory curvature and illusory expansion effects elicited simultaneously for the same pattern during the self-motion of the observer. The combination of these effects was reported for the first time in our papers. The impact of the AGI stems from it being the simplest stimulus we could employ to study the interaction of the mechanisms underlying the phenomenology of expansion and induced curvature, and their relation to mechanisms of motion and form perception. Visual illusions are worthy of scientific inquiry when they provide insights on how the visual system works, and the Accordion Grating is a novel and informative pattern that advances that aim.

Acknowledgments

We thank Oliver Winston Layton, who provided useful comments on an earlier version of the manuscript. This work was supported in part by CELEST (NSF SBE-0354378 and OMA-0835976).

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19 June 2012

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