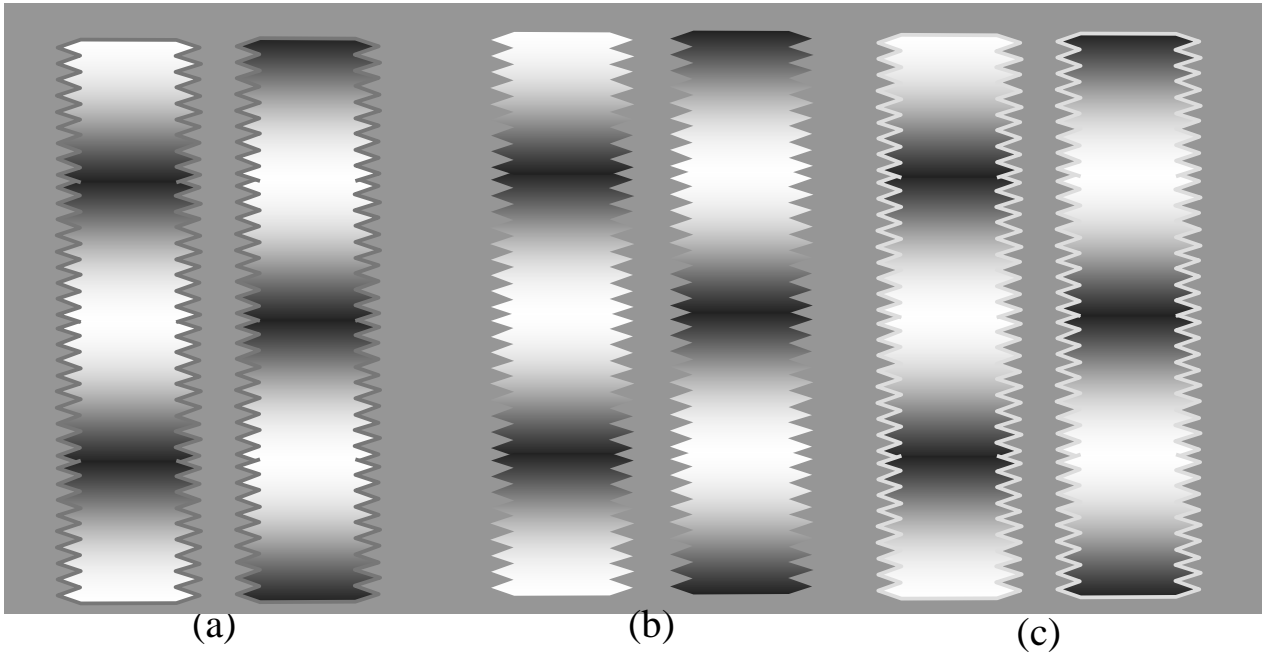


## Skyscrapers and clouds.

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In our illusion the vertical sides of the towers appear to bulge out when a cloud passes behind.

The figure above illustrates the basic effects at the origin of the illusory distortion (viewing distance suggested: 100 cm). Vertical bands with luminance varying sinusoidally from dark to white are presented against a mid grey background.

The illusory waving of the vertical side is very conspicuous when a tick line of intermediate grey runs all along the jagged contour (a). The impression is weaker when the line is absent (b). The magnitude of the effect depends on the luminance of the contour line: the illusion disappears when the thick line along the jagged contour is light. The illusion persists if we use a red background isoluminant with the lighter portions of the bar. This rules out the simplest account of the apparent distortion of the contour based on the “white expansion” effect, that makes the white parts of the bands to perceptually bulge out.

Since we perceive the distortion in a direction perpendicular to the major axes of the band, one cannot call into cause as explanation the interactions between the surface and a linear contour (Roncato & Casco, 2003; Shapiro, 2005) because the directions they take are oblique with respect to the vertical axes.

Our hypothesis is that the sum of two distinct basic effects accounts for the apparent distortion of the bars (a). Within the area occupied by the jagged contour local luminance signals may be averaged and this induces the “white expansion” effect. This acts in isolation in (b). In (a) this effect combines with an illusory effect due to the thick line along the jagged contour.

The direction of distortion coincides with the illusory effect observed when the jagged contour is replaced by a right outline leading to think that the illusion belongs to the class known as MONTALVO illusions (Woodhouse and Taylor 1987; Kitaoka et al, 2004)

Woodhouse, J. M. and Taylor, S. P. (1987) Further studies of the Cafe Wall and Hollow Squares illusions. *Perception*, **16**, 467-471

Kitaoka, A., Pinna, B., and Brelstaff, G. (2004). Contrast polarities determine the direction of Cafe Wall tilts. *Perception*, **33**, 11-20.

Shapiro, A. G., Charles, J. P., Shear-Heyman, M. (2005). "Visual illusions based on single-field contrast asynchronies." *Journal of Vision*. Vol. 5, No. 10, pp. 764-782.

