Partial Object Doubling Induced by Negative Afterimages in the Periphery

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Visual illusions are both aesthetically pleasing and puzzling effects. But they can also provide substantial information about how our brains process information from the physical world. Recently, we reported a new phenomenon in which the shape of a peripherally viewed object that moves against an oriented grid background appears distorted and doubled. We call this phenomenon “partial object doubling” (Thornton & Riga, 2024). We argue that this illusory doubling occurs due to the release of negative afterimages, which create a dynamic texture within the object. These afterimages interact with the object's physical contours, causing it to “split.” Through a series of interactive demos, we show that the luminance contrast between the target and the background is one of the most critical factors for the illusion to occur. Although we utilise a well-known motion illusion—the Furrow illusion (Anstis, 2012; Cormack et al., 1992)—to demonstrate this new effect, we show that the two phenomena are in fact independent.