Lightness and Color Constancies Do Not Affect Perceptual Appearance: Linton Lightness and Color Constancy Illusions

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We present two new illusions that challenge our understanding of lightness and color constancies. Traditional accounts of lightness and color constancies suggest that they change our visual experience, so that a grey patch (retinal value = 0.5 black) is experienced as dark-grey (perception = 0.7 black) when it corresponds to a "black" patch, and light-grey (perception = 0.3 black) when it corresponds to a "white" patch. By contrast, Linton, 2023, *Phil. Trans. R. Soc. B*, 378, 20210455 argues that our visual experience is the same in both conditions (perception = retinal value = 0.5 black), and that all that lightness and color constancies do is bias our cognitive judgements about our visual experience: they block our ability to judge that our visual experience is the same in both conditions. Existing experimental paradigms (e.g. matching two patches) can't differentiate between these two accounts. However, Linton's account predicts that if we slowly morph between the two different interpretations of the same patch (by varying its surrounding context) the appearance of the patch itself should not change. We take Akiyoshi Kitaoka's versions of Bart Anderson's lightness and color constancy illusions, where a disk is interpreted differently depending on its surround. We show that if you slowly transition between the two interpretations of the disk (by changing its surround), the disk itself does not change its appearance (our percept doesn't change), despite our cognitive judgement of the disk's color changing. This suggests that even the strongest lightness and color constancies are merely cognitive effects.