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Letter to the Editor

Del Aguila-Carrasco, AJ

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Corresponding Author: Dr. Antonio J. Del Águila-Carrasco, PhD

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First Author: Antonio J. Del Águila-Carrasco, PhD

Order of Authors: Antonio J. Del Águila-Carrasco, PhD; Iván Marín-Franch, PhD

Abstract: This is a Letter to the Editor. No abstract required.

Dear Editor,

We read with interest the recent study by Leube and colleagues (2017) that shows the effect of real defocus blur (where a clear target was presented with blur induced optically with lenses of different power) and simulated defocus blur (where a blurred target was presented without optical blur) on the visual acuity (VA) under monochromatic light conditions. The key difference between the two conditions is that, with optical blur, the light rays reach the retina with some optical vergence (converging if the lens is negative; diverging if the lens is positive), whereas, with target blur, optical vergence is always zero and the computationally blurred target is presented focused at the retina.

The results obtained in this experiment showed that the reduction in VA was symmetric with respect to defocus blur under monochromatic light conditions. However, since an asymmetric reduction in VA was found in previous studies with polychromatic light, authors concluded that "the visual system uses the chromaticity of light and the chromatic aberration of the eye's optics to identify the sign of defocus, **but not the presence of light vergence**". The first part of their conclusion that chromatic aberration is used to detect the sign of defocus is in agreement with the seminal works by Fincham (1951) and by Kruger and colleagues (Kruger, Mathews, Aggarwala, & Sanchez, 1993). However, the second part of their conclusion, ruling out from their data that light vergence is a mechanism to identify the sign of defocus, is speculative. The authors made this point in the Discussion subtly: "since the visual acuity seems to be unaffected by the absence of the light vergence it is suggested that the high spatial frequency channels have no input from light vergence for the detection of the sign of defocus, **or in any case, its input does not affect VA**." Results from recent studies strongly support the hypothesis that the visual system does use optical vergence to infer the sign of defocus and accommodate accordingly (Del Águila-Carrasco et al., 2017; Marín-Franch et al., 2017).

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Antonio J. Del Águila-Carrasco[1], Iván Marín-Franch[2]

1. Independent researcher, Jerez de la Frontera, Spain

2. Department of Ophthalmology, University of Alabama at Birmingham School of Medicine, Birmingham, Alabama, USA

E-mail address: dacantonioj@gmail.com