

ARVO 2019

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# View Abstract

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**CONTROL ID:** 3151394**SUBMISSION ROLE:** Abstract Submission**AUTHORS****AUTHORS (LAST NAME, FIRST NAME):** Villegas, Eloy A.<sup>1</sup>; Hervella, Lucía<sup>2, 1</sup>; Artal, Pablo<sup>1</sup>**INSTITUTIONS (ALL):** 1. Laboratorio de Óptica, Universidad de Murcia, Murcia, Murcia, Spain.  
2. Voptica, SL, Spain.**Commercial Relationships Disclosure (Abstract):** Eloy Villegas: Commercial Relationship(s);Voptica, SL:Code I (Personal Financial Interest) | Lucía Hervella: Commercial Relationship(s);Voptica, SL:Code E (Employment) | Pablo Artal: Commercial Relationship(s);Voptica, SL:Code I (Personal Financial Interest)**Study Group:** (none)**ABSTRACT****TITLE:** Inter-subject variability of through-focus visual acuity with induced spherical aberration**ABSTRACT BODY:****Purpose:** To determine the differences in the through-focus visual acuity curves between subjects looking through induced values of spherical aberration used to extend depth-of-focus.**Methods:** An Adaptive Optics Visual Simulator (VAO, Voptica SL, Murcia, Spain) was used to measure the through focus visual acuity (VA) from +0.50 to -3.0 D, in steps of 0.50 D, in 14 eyes with paralyzed accommodation for different optical conditions. (1) correction of spherical aberration as the baseline condition, (2) two values of induced negative spherical aberration (SA) of -0.15 and -0.30  $\mu\text{m}$  (for 4-mm pupil). The inter-subject means and the 95% confidence intervals (CI), calculated as  $1.96 \times \text{SD}$ , were estimated for all defocus values.**Results:** The mean values of LogMAR (and CI) at far were -0.12 (CI,  $\pm 0.09$ ), 0.02 (CI,  $\pm 0.12$ ) and 0.21 (CI,  $\pm 0.32$ ), at intermediate distance (1.5 D) were 0.11 (CI,  $\pm 0.24$ ), -0.01 (CI,  $\pm 0.16$ ) and -0.02 (CI,  $\pm 0.10$ ) and at near distance (3.0 D) were 0.48 (CI,  $\pm 0.49$ ), 0.22 (CI,  $\pm 0.37$ ) and 0.11 (CI,  $\pm 0.17$ ) for the baseline, -0.15- $\mu\text{m}$  SA and 0.30- $\mu\text{m}$  SA profiles respectively. Inter-subject variability of VA, expressed as CI, at far distance presented the largest value of CI for 0.30- $\mu\text{m}$  SA while at intermediate and near distances was for the baseline condition. The CI values ranging between  $\pm 0.1$  and  $\pm 0.4$  LogMAR for all defocus values in both values of induced SA.**Conclusions:** The induction of spherical aberration provides quite different visual performance depending on each subject. When SA is induced either in LASIK procedures or with IOLs, preoperative visual simulation using adaptive optics instruments, such as VAO, would allow the customization of the precise SA value to improve patient quality of vision after surgery.

(No Image Selected)

**DETAILS****PRESENTATION TYPE:** #1 Paper, #2 Poster**CURRENT REVIEWING CODE:** 3240 presbyopia: assessment, corrections and treatments - VI**CURRENT SECTION:** Visual Psychophysics/Physiological Optics**Clinical Trial Registration (Abstract):** No**Other Registry Site (Abstract):** (none)**Registration Number (Abstract):** (none)**Date Trial was Registered (MM/DD/YYYY) (Abstract):** (none)**Date Trial Began (MM/DD/YYYY) (Abstract):** (none)**Grant Support (Abstract):** Yes**Support Detail (Abstract):** ERC-2013-AdG-339228, FIS2013-41237-R**TRAVEL GRANTS and AWARDS APPLICATIONS**

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