

Metamorphopsia measurement with AMD - A Metamorphopsia Detector® as a patient reported outcome (PRO) measure

Dipl.-Ing. Ronald Krüger, M.A.; Daniela Claessens, MD, M.Sc.; Dürener Str. 251; 50931 Cologne; Germany

Purpose

Metamorphopsia as a patient reported outcome can be documented by the computer based interactive program AMD - A Metamorphopsia Detector® (patent pending). This study was performed to compare metamorphopsia measurement by AMD - A Meta-morphopsia Detector® with results of the National Eye Institute Visual Function Questionnaire - 25 (NEI-VFQ 25) reflecting vision related quality of life.

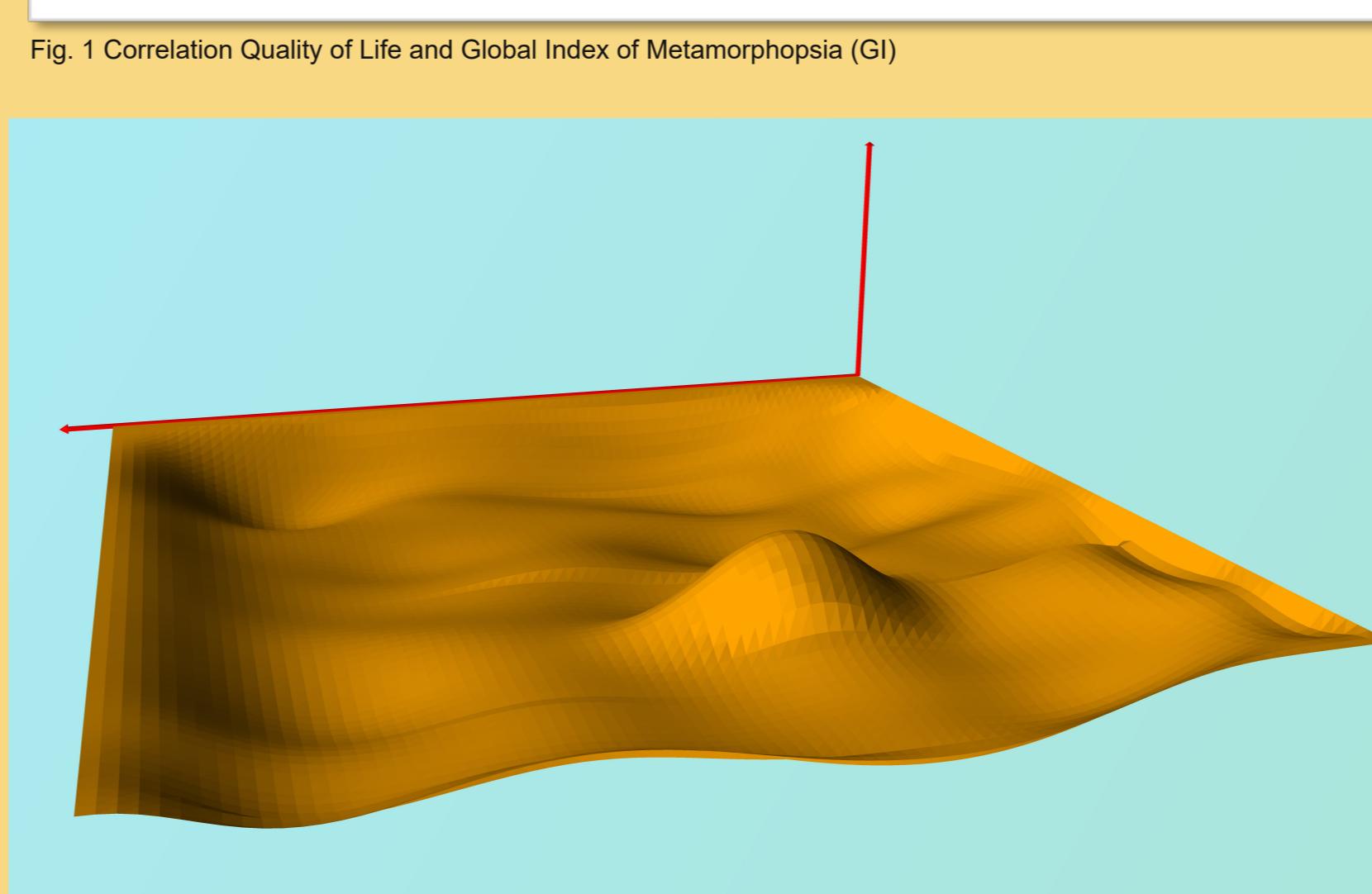
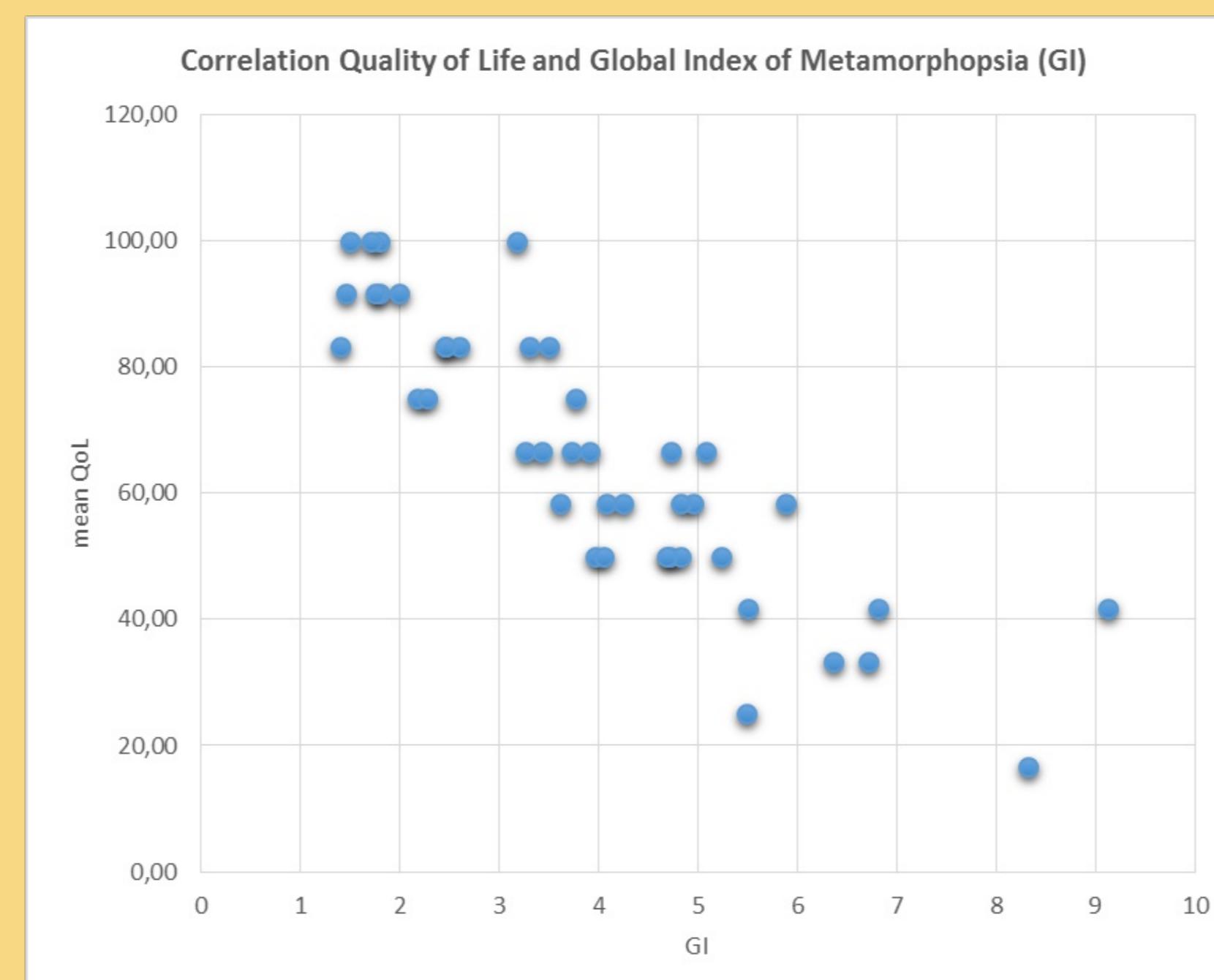
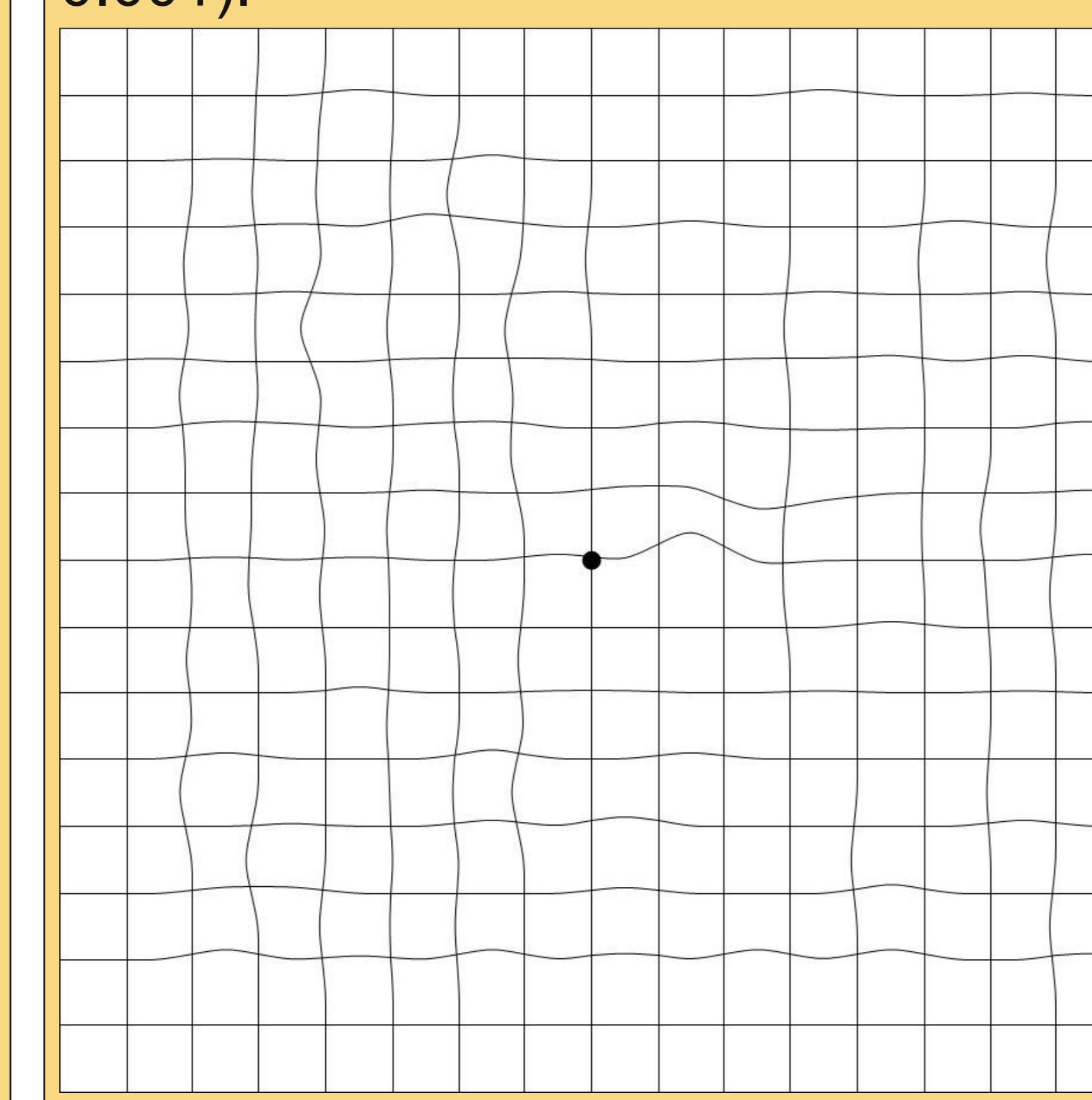
Method

75 patients with unilateral metamorphopsia performed monocular metamorphopsia measurement with AMD - A Metamorphopsia Detector® [1-2]. The software uses the concept of a negative image: a distorted image can be straightened by using the computer mouse. Amplitude (d), localization (ϵ) and area (a) of distorted lines are transformed into single dimensions and summarized in a global value. All patients were asked to fill out the NEI-VFQ 25 [3]: response rate was 56% ($n=42$, caucasian, age 40-86 years, 19 male, 23 female). In all responding patients (macular edema due to age related macular degeneration=22, central venous thrombosis=2, diabetes=3, uveitis=4, intermediate AMD=7, macular pucker=4) correlation of NEI-VFQ 25 (subscale near vision) on the one side and AMD - A Metamorphopsia Detector® global value (GI) or single dimensions respectively were measured. Prior to the study all patients signed informed consent according to the declaration of Helsinki/Edinburgh.

Results I

I. Metamorphopsia Global Value

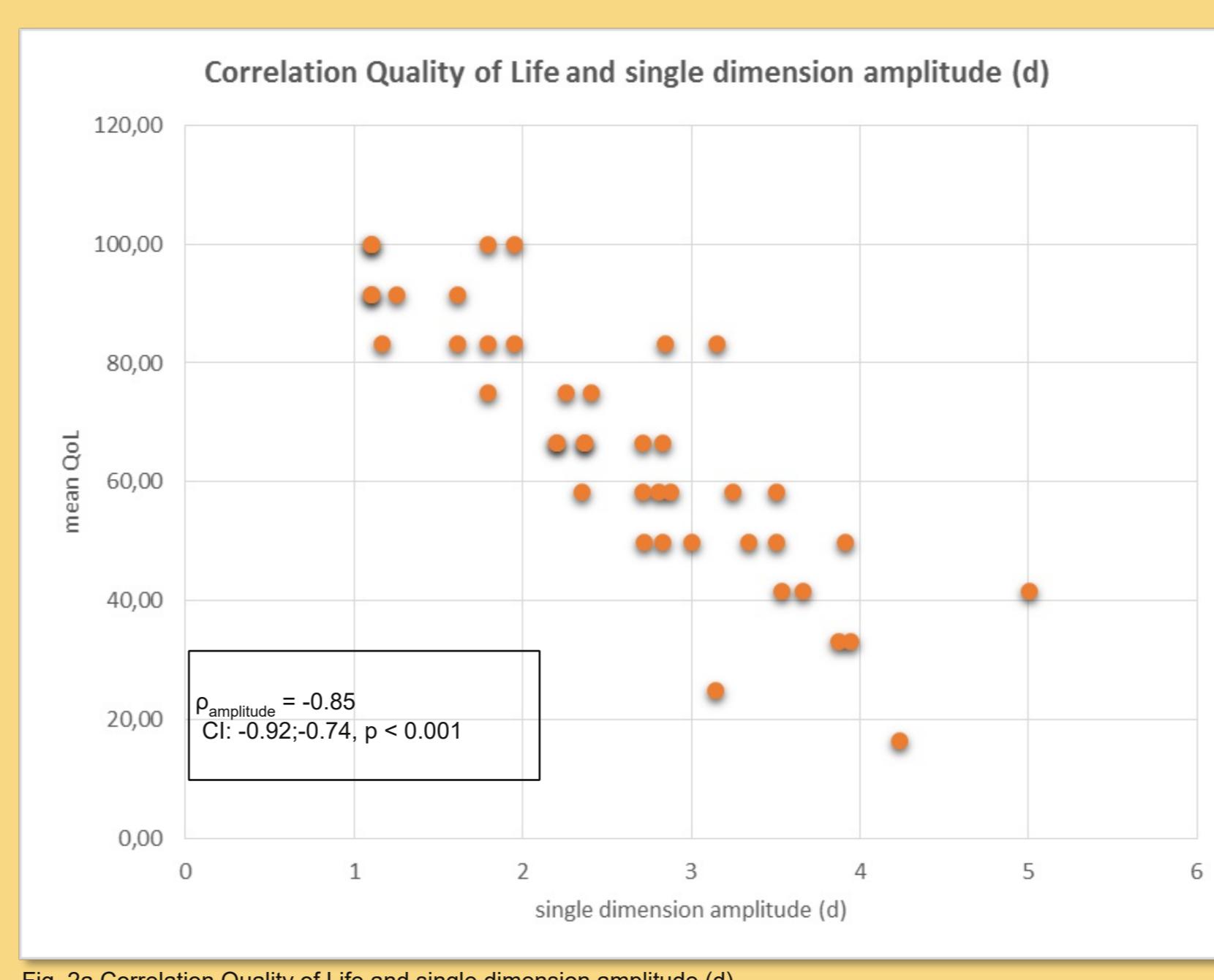
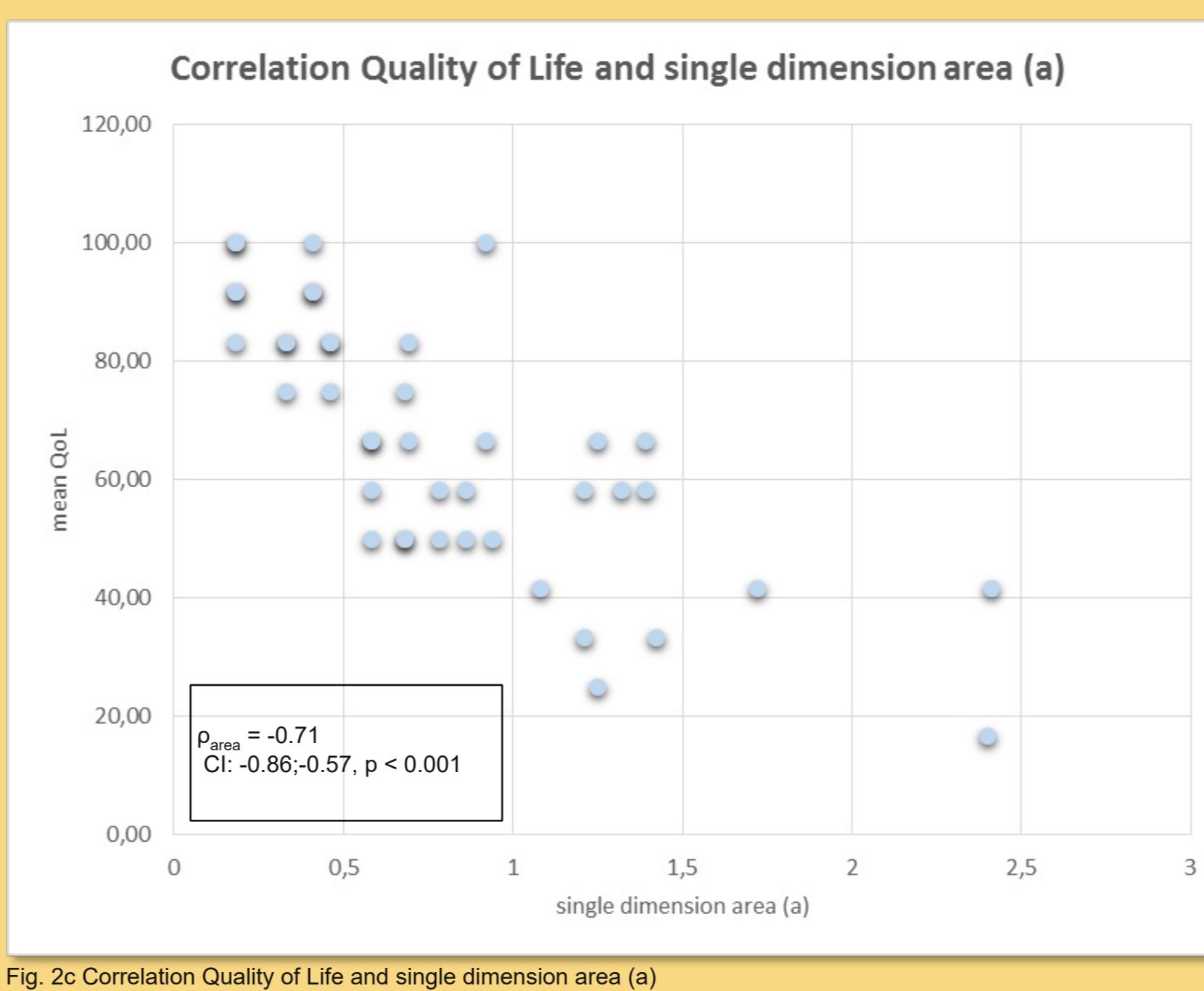
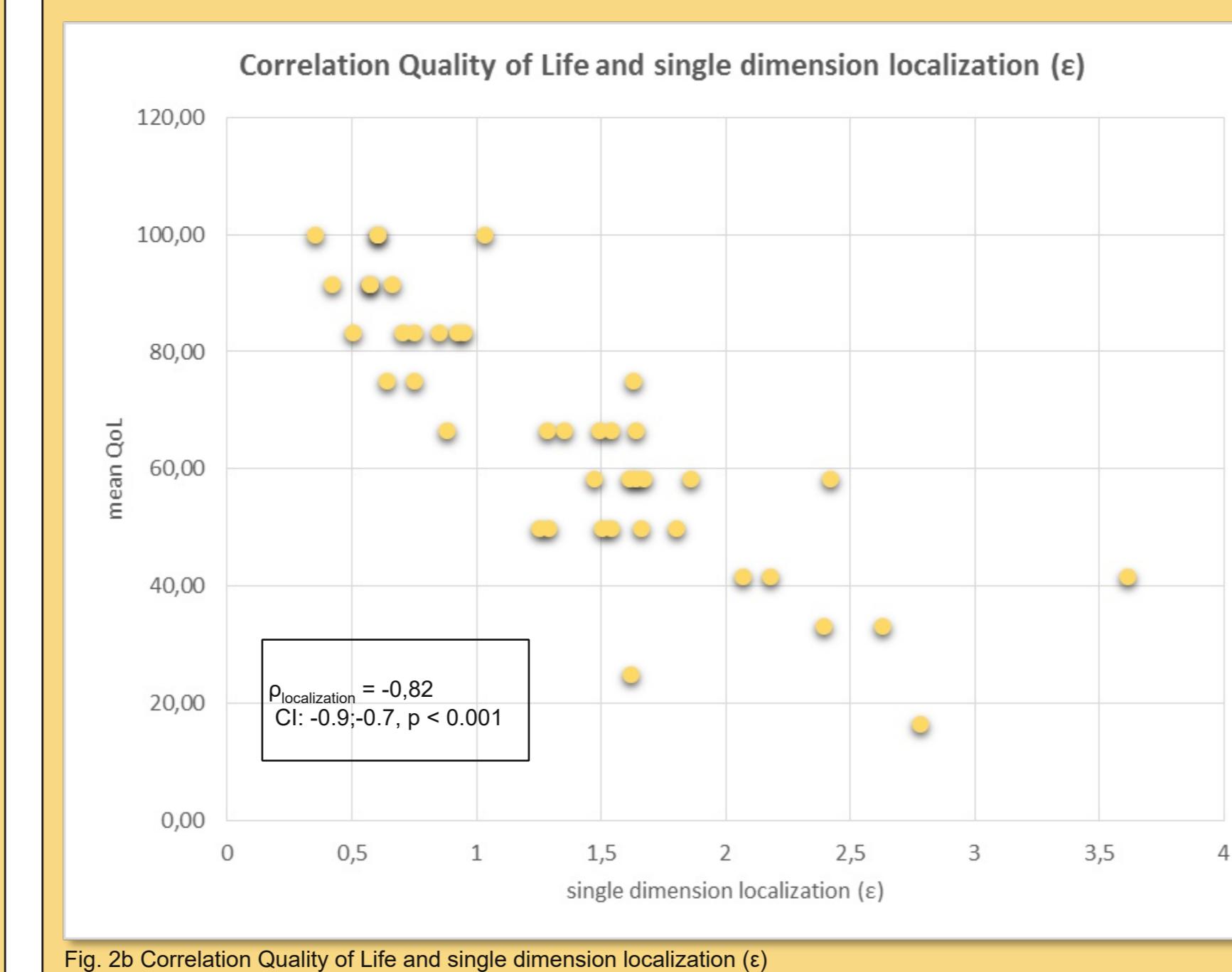
Correlation of metamorphopsia global value with subscale near vision of NEI VFQ 25 was strong (Fig.1): Pearson correlation coefficient $p = -0.87$ (95% confidence interval: -0.93 ; -0.77 , $p < 0.001$).



Results II

II. Metamorphopsia Single Dimensions

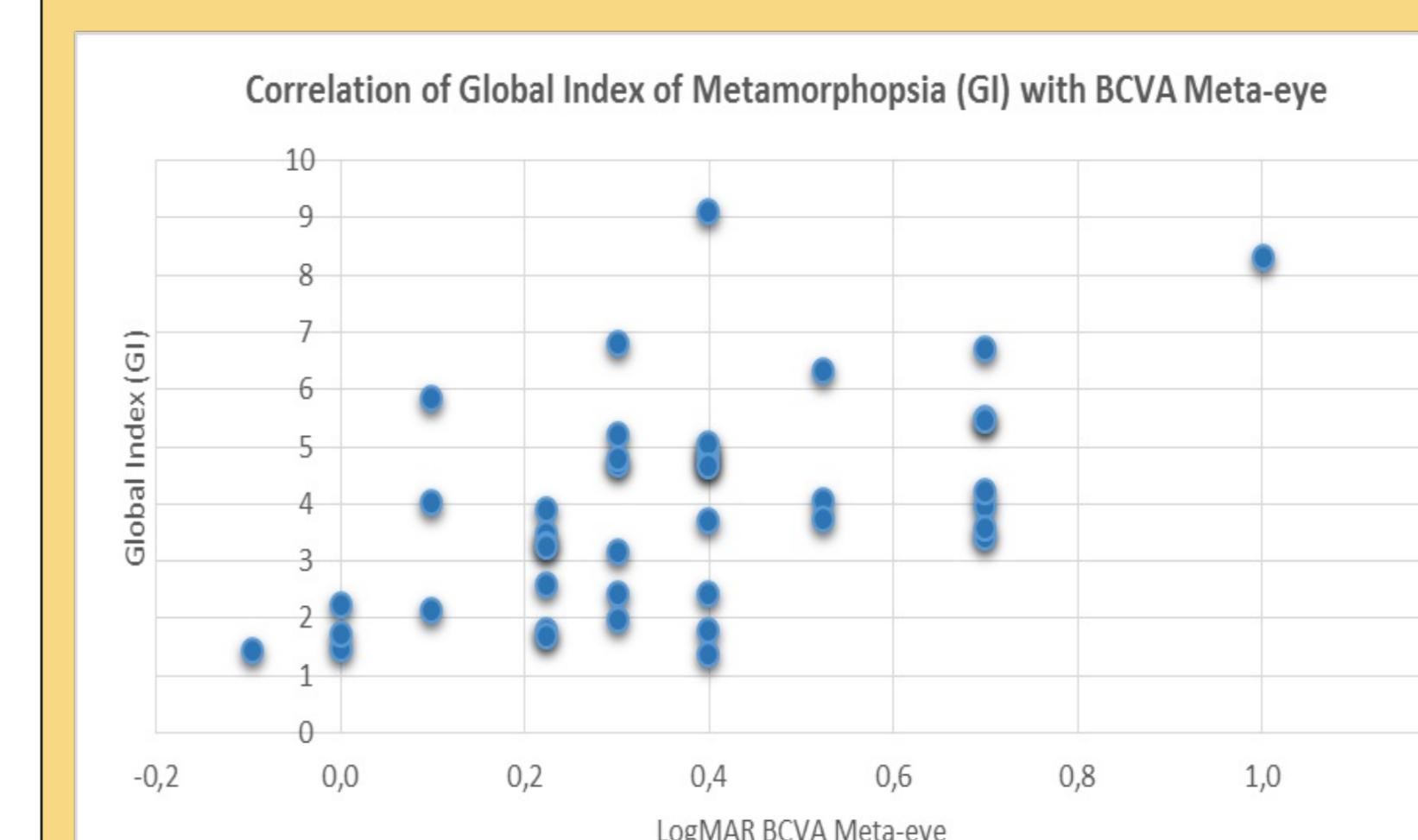
Correlation of metamorphopsia single dimensions with NEI VFQ 25 subscale near vision was strong for amplitude, localization and area of distortion (Fig. 2a-c).



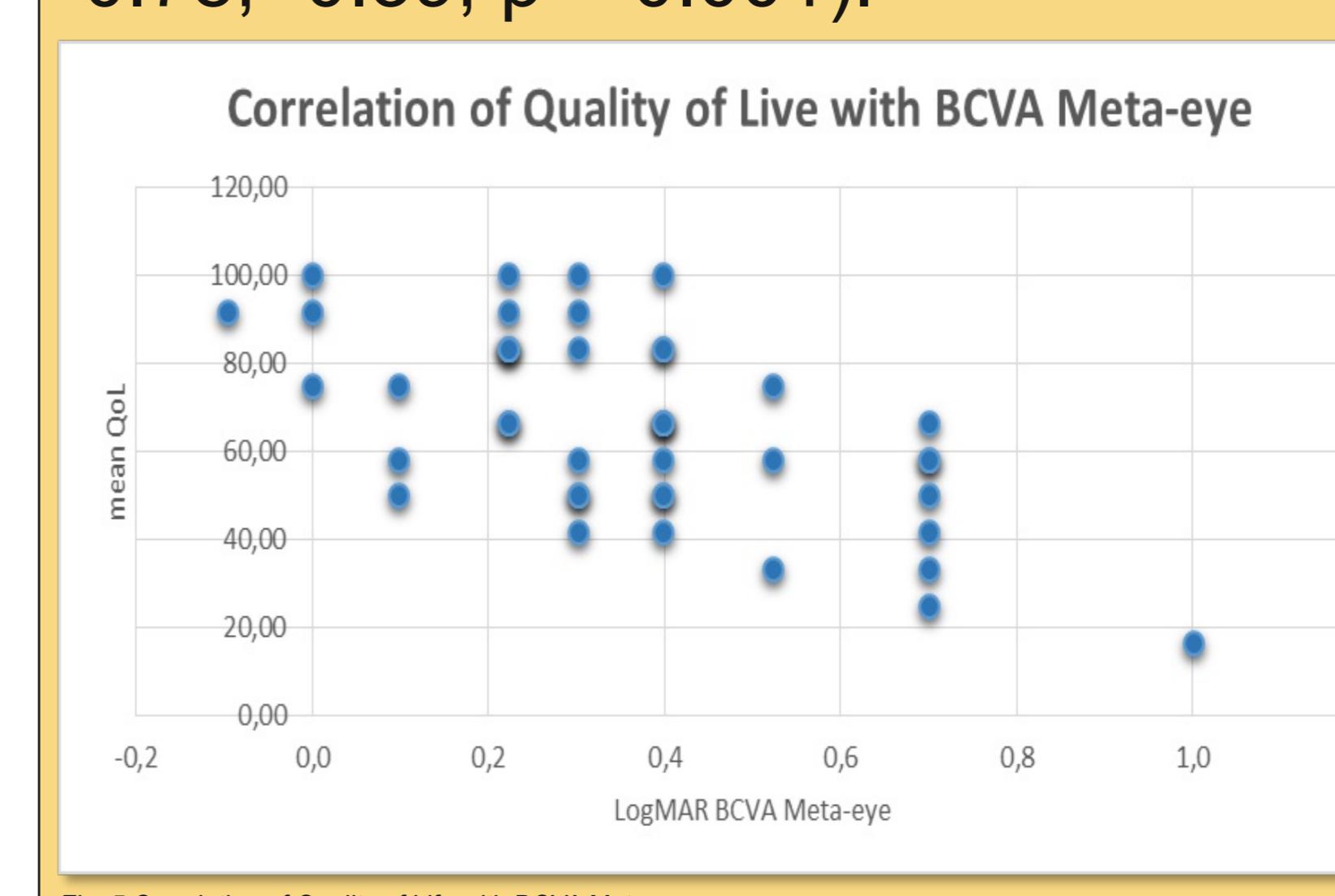
Results III

III. Best corrected visual acuity

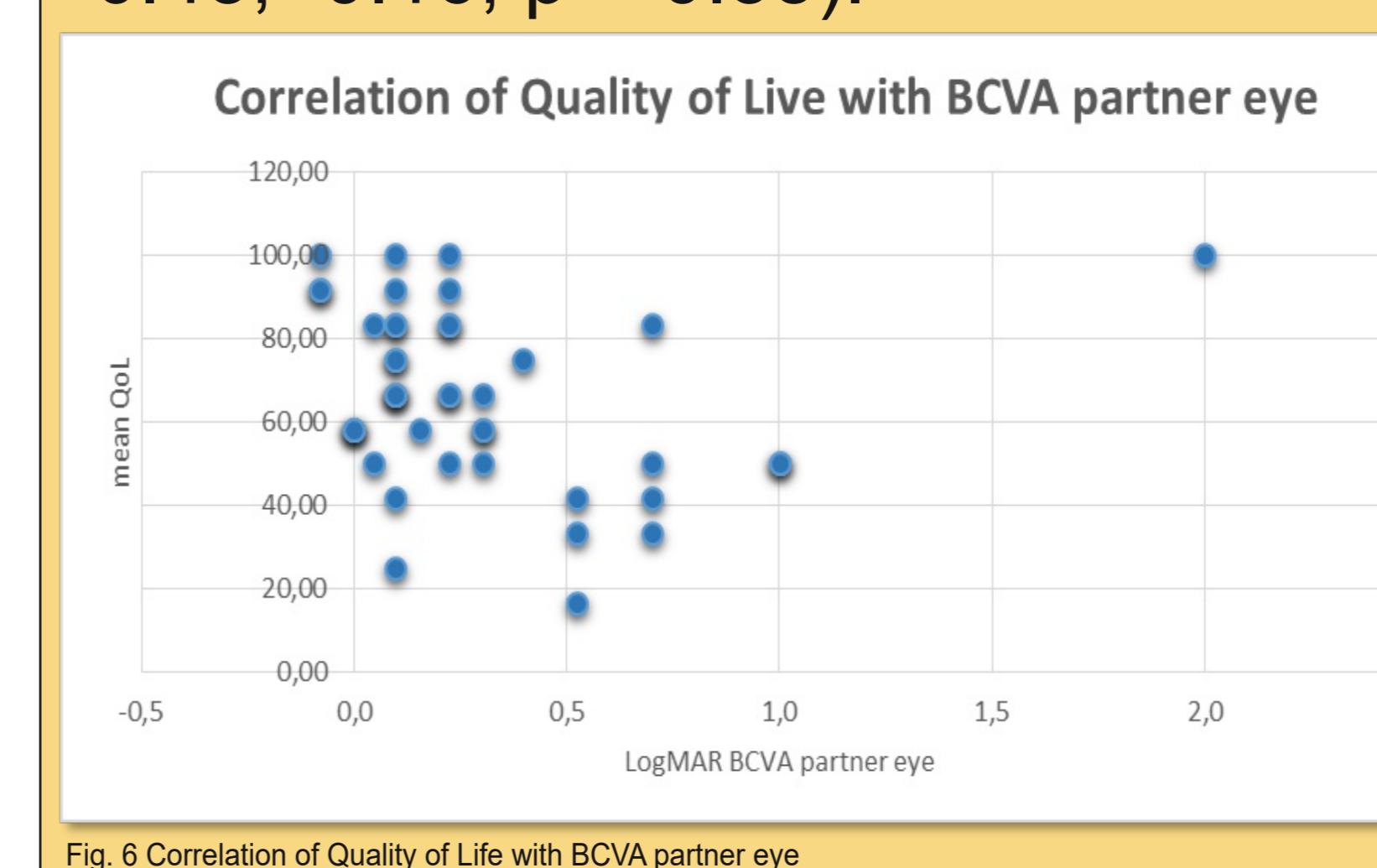
Correlation of metamorphopsia global value (GI) with BCVA of the eye with metamorphopsia (Meta-eye) was just about strong: $p = 0.53$ (CI: 0.27 ; 0.72 , $p < 0.001$).



Correlation of BCVA of the eye with metamorphopsia with NEI VFQ 25 subscale near vision was strong: $p = -0.62$ (95% confidence interval: -0.78 ; -0.39 , $p < 0.001$).



Correlation of BCVA of partner eye with NEI VFQ 25 subscale near vision was weak: $p = -0.15$ (95% confidence interval: -0.43 ; -0.16 , $p = 0.35$).



Discussion

Best corrected visual acuity of the eye with metamorphopsia and of partner eye were taken into account as potential confounders. Further confounders might be dominance of eyes and accompanying eye diseases.

Conclusion

As a quantitative test highly correlating with vision related quality of life AMD – A Metamorphopsia Detector® can deliver information about a patient reported outcome [4-5] in macular disease. Whereas the validated questionnaire NEI VFQ 25 delivers data about vision related quality of life referring to binocular vision, measurement with AMD – A Metamorphopsia Detector® provides information about monocular metamorphopsia. Strongest correlations were found between vision-related quality of life (subscale near vision) and metamorphopsia global index (GI), single dimension amplitude (d), localization (ϵ) and area of distortion (a). Because metamorphopsia has a significant influence on quality of life it should be regarded as a patient relevant outcome.

Literature

1. Claessens, D., Krüger, R., AMD-A Metamorphopsia Detector. ARVO Association for Research and Vision in Ophthalmology, 2015.
2. Claessens D., K.R. and Patient reported outcome documented by AMD - A Metamorphopsia Detector®. IOVS, 2016. Posterboard Number: 31 - A0022.
3. Mangione, C.M., et al., Psychometric properties of the National Eye Institute Visual Function Questionnaire (NEI-VFQ). NEI-VFQ Field Test Investigators. Arch Ophthalmol, 1998. 116(11): p. 1496-504.
4. Denniston, A.K., et al., An introduction to patient-reported outcome measures in ophthalmic research. Eye (Lond), 2014. 28(6): p. 637-45.
5. Finger, R.P., et al., Quality of life in age-related macular degeneration: a review of available vision-specific psychometric tools. Qual Life Res, 2008. 17(4): p. 559-74.

Presentation Number - Posterboard Number: 1522 - B0203 Session Number: 223 Session Title: AMD

Session Date / Times: May 08, 2017, 8:30 AM - 10:15 AM Commercial Relationships Disclosure:

Daniela Claessens: Commercial Relationship(s);app4eyes: Code I (Personal Financial Interest), Code C (Consultant), Code P (Patent)

daniela.claessens@app4eyes.de
ronald.v.krueger@app4eyes.de

