

**Authors' response—Approach to evaluating the reliability
and validity of conjunctival ultraviolet autofluorescence
measurement**

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We thank Sabour and Ghassemi for their interest in our recent publication.¹ Clearly the assessment of validity and reliability is important when developing a novel tool to objectively measure ocular ultraviolet radiation exposure.

The concordance correlation coefficient (CCC) was used in our study because it provides a robust and valid approach for the assessment of reliability between measures of continuous variables.² Several other measures of reliability of continuous variables are available, including the intraclass correlation coefficient (ICC); however, these measures do not address both precision and accuracy as does the CCC.³ Under certain conditions, the CCC produces results that are almost identical to that of the ICC.⁴ For example, in our study the interobserver CCC for 'total' ultraviolet autofluorescence (UVAF) was 0.924, while the calculated ICC was 0.923. For intraobserver reliability of 'total' UVAF, the CCC was 0.988 and ICC 0.989, respectively.

κ was used to assess reliability of categorised UVAF measures. Clearly the results from such analysis will be largely determined by the choice of category limits. Hence, we presented data for two different definitions (groups of either 5 mm² or 10 mm²), and these category limits were selected to potentially reflect clinically meaningful differences. Moreover, we used unweighted κ because deciding on appropriate weights is subjective. Nonetheless, our interpretation of the κ

statistic is in accordance with published guidelines,⁵ although the choice of cut-offs in defining 'good agreement' is inevitably arbitrary, and other interpretations exist.

It is appreciated that the interpretation of κ should incorporate sound clinical judgement. However, it must be noted that the clinical correlations of this recently developed metric of ocular sun exposure has not been well studied in the clinical setting. We also acknowledge that one cannot reliably compare κ values between different studies, as κ values are sensitive to the prevalence of different categories, and to bias.

Finally, in response to the statement 'UVAF correlates strongly with the authors' survey-based assessment of time spent outdoors,' it is important to note that this correlation refers to a measure of validity, and not reliability. Nowhere in our manuscript did we report or suggest that this correlation was a measure of reliability.

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REFERENCES

1. **Sherwin JC**, McKnight CM, Hewitt AW, *et al*. Reliability and validity of conjunctival ultraviolet autofluorescence measurement. *Br J Ophthalmol* 2012;**96**:801–5.
2. **Lin LI**. A note on the concordance correlation coefficient. *Biometrics* 2000;**56**:324–5.
3. **Crawford SB**, Kosinski AS, Lin HM, *et al*. Computer programs for the concordance correlation coefficient. *Comput Methods Programs Biomed* 2007;**88**:62–74.
4. **Nickerson CA**. A note on "a concordance correlation coefficient to evaluate reproducibility". *Biometrics* 1997;**53**:1503–7.
5. **Altman D**. *Practical Statistics for Medical Research*. London, England: Chapman and Hall, 1991.



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