

CORRESPONDENCE



Comment on: 'Conversion of Snellen visual acuity to LogMAR visual acuity'

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Eye (2022) 36:1709–1710; <https://doi.org/10.1038/s41433-021-01767-9>

TO THE EDITOR:

To improve the precision of visual acuity charts, individual letter scoring is recommended [1]. The interval of interest is divided into equal steps according to the number of letters in the interval (linear interpolation).

Tiew et al. [2], describe a method of assigning 0.02 logMAR to each Snellen letter, the value typically assigned to individual letters on the ETDRS chart [3], which has 5 letters per line on every line, unlike the Snellen chart.

We examined two different methods of scoring individual letters on a Snellen chart. Firstly, each letter was scored using linear interpolation. The value of each letter was calculated by dividing the total logMAR value of the interval by the number of letters in the interval. Secondly, the method described by Tiew et al. was employed. The magnitude of 'error' was calculated for each letter by subtracting the results of one method from the other.

Snellen charts with and without the 6/7.5 line were examined using both 'plus' and 'minus' notation (e.g. 6/60⁺¹ vs. 6/36⁻¹).

RESULTS

The logMAR value of each letter calculated by linear interpolation varied and did not stay as 0.02 logMAR consistently, ranging between 0.01 to 0.11. The largest error caused by the method described by Tiew et al. departing from linear interpolation was ± 0.09 logMAR. See Table 1 for other examples.

Identical Snellen values, using plus and minus notation, such as 6/6⁺⁴ and 6/5⁻⁴, produced different logMAR values.

If the multiplication of gained or missed letters by the coefficient of 0.02 exceeded the difference between the two lines' logMAR equivalents, then the formula proposed by Tiew et al. generated implausible values, e.g. 6/6⁺⁵ produced a better logMAR value than 6/5.

The method used by Tiew et al. was consistent only for the 6/12 to 6/9 interval, because the value of the whole interval (0.12) divided by the number of available letters (6) was 0.02.

Compared to conversion by linear interpolation, the method described by Tiew et al. performed inconsistently. In estimating logMAR values, the number of letters in each interval must be considered and analysis tailored to the particular chart used on a line-by-line basis.

Table 1. Examples of the potential errors arising from use of the method described by Tiew et al. compared with linear interpolation.

	Snellen		Tiew et al. logMAR calculations		Errors	
	Plus notation	Minus notation	'Plus' notation (TPN)	'Minus' notation (TMN)	TPN - LI	TMN - LI
6/6 to 6/5 interval	6/5	6/5	-0.08	-0.08	0.00	0.00
	6/6 ⁺⁷	6/5 ⁻¹	-0.14	-0.06	-0.07	0.01
	6/6 ⁺⁶	6/5 ⁻²	-0.12	-0.04	-0.06	0.02
	6/6 ⁺⁵	6/5 ⁻³	-0.10	-0.02	-0.05	0.03
	6/6 ⁺⁴	6/5 ⁻⁴	-0.08	0.00	-0.04	0.04
	6/6 ⁺³	6/5 ⁻⁵	-0.06	0.02	-0.03	0.05
	6/6 ⁺²	6/5 ⁻⁶	-0.04	0.04	-0.02	0.06
	6/6 ⁺¹	6/5 ⁻⁷	-0.02	0.06	-0.01	0.07
	6/6	6/6	0.00	0.00	0.00	0.00
6/18 to 6/12 interval	6/12	6/12	0.30	0.30	0.00	0.00
	6/18 ⁺⁴	6/12 ⁻¹	0.40	0.32	0.06	-0.02
	6/18 ⁺³	6/12 ⁻²	0.42	0.34	0.05	-0.03
	6/18 ⁺²	6/12 ⁻³	0.44	0.36	0.03	-0.05
	6/18 ⁺¹	6/12 ⁻⁴	0.46	0.38	0.02	-0.06
	6/18	6/18	0.48	0.48	0.00	0.00

Results have been rounded to two decimal places.

LI linear interpolation, TPN method described by Tiew et al. using 'plus' notation, TMN method described by Tiew et al. using 'minus' notation.

Received: 1 May 2021 Revised: 13 August 2021 Accepted: 9 September 2021
Published online: 20 January 2022

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approval of the version to be published and agree to be accountable for all aspects of the work.

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ACKNOWLEDGEMENTS

Not applicable.

AUTHOR CONTRIBUTIONS

NAF conceptualised the work. RCC and NAF were responsible for the analysis and interpretation of data. RCC and NAF drafted the manuscript. Both authors gave final

FUNDING

This work did not receive any specific funding.

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

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