

Feedback improves measured visual acuity in adults

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Abstract

Purpose : Visual acuity (VA) is used in clinical practice for both screening and measuring visual function. Many factors must be standardized to obtain valid and repeatable VA measures and this study aimed to quantify the effects of providing different levels of feedback during VA assessment.

Methods : Single, crowded Sloan letters (ETDRS and HOTV sets) were presented on the Electronic Visual Acuity (EVA) system to 14 visually-normal adults. Three different levels of feedback were given: (1) no feedback, (2) whether the response was correct or incorrect (minimum feedback), and (3) correction of incorrect responses (maximum feedback). Measurements were performed on each participant twice to assess the effect of feedback on test-retest reliability.

Results : There was no significant difference in measured VA between the no feedback and minimum feedback conditions (0.00 logMAR, $p = 0.463$). Measured VA was

significantly better when maximum feedback was provided (0.04 logMAR and 0.05 logMAR; $p < 0.0001$) when compared with no and minimum feedback, respectively. VA improved between measurement sessions 1 and 2 (0.025 logMAR better in second session; $p = 0.024$). In session 2, level of feedback provided was not significant ($p = 0.3782$) suggesting that the learning effect from maximum feedback happened at the first visit and was retained at the second visit.

Conclusions : At threshold size, recognition of letters depends on the ability to resolve limbs and gaps in the optotype and is assisted by the overall shape of the letter. Correcting incorrect responses allows adults to become more familiar with the shape of the letter at small sizes, increasing measured VA. Repeatability of VA measures will be improved if there is a consistent level of feedback provided.

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