Analysis of Peripheral Vision to Aid the Reading Process in Patients with Macular Degeneration

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Macular degeneration (AMD) causes central vision loss. With no known cure, AMD patients are forced to use their peripheral vision. Peripheral reading is slow and frustrating. Last year's research proved large visual span and whole-word reading are hallmarks of high-speed central vision reading. This year's research aimed to increase peripheral reading speed by examining the mechanics of peripheral reading through a two-step investigative approach. The first step identified factors that make peripheral reading slow. (A) Participants read 3 and 8 letter words. When adults with central vision read 8 letter words their reading speed dropped only 3%. Interestingly, AMD participants experienced a major 43% drop that revealed word-length effect caused by a short visual span. (B) When AMD participants read normal text and mirror text, a letter-by-letter reading pattern was identified that revealed crowding in the peripheral vision. This formed the hypothesis that relieving crowding and widening peripheral visual span hold the key to increase peripheral reading speed. The second step tested this hypothesis. (i) Text was modified to relieve crowding. This yielded a 27% increase in reading speed. (ii) A special training method was created to widen peripheral visual span. This yielded a 9% increase in reading speed. (iii) However, when both factors were applied together i.e. trained AMD participants with a wider peripheral visual span read modified text, the reading speed increased by a significant 69% clearly supporting the hypothesis. This new visual rehabilitation method will provide much needed relief to 15 million Americans with AMD.