

## The Blind Leading the Double Blind

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Last year marked the 50th anniversary of the original opinion piece published by the American Academy of Pediatrics, the American Academy of Ophthalmology and Otolaryngology, and the American Association of Ophthalmology in the journal *Pediatrics*,<sup>1</sup> concluding that: “Eye care should never be instituted in isolation when a patient has a reading problem”. The article opined that the significance and magnitude of learning disability had generated a proliferation of diagnostic and remedial procedures, “many of which imply a relationship between visual function and learning”.

The intent of the publication above, and similar opinion pieces subsequently issued each decade since then, has apparently been to discredit the role of Optometry and its visual interventions in helping children who have academic difficulties. This ranges from the alleged prescribing of “unnecessary glasses”, to vision therapy procedures purportedly of dubious value. In 2002, Dr. Merrill Bowan authored a pointed rebuttal in *Optometry*, the Journal of the American Optometric Association, based on an extensive review of the literature.<sup>2</sup> The substance of his rebuttal was ignored by the organizations committed to perpetuating a skewed viewpoint to the public. When they re-packaged their criticisms in 2009, the journal *Optometry* published another rebuttal exposing the flaws and thinly veiled biases, this time by Dr. Daniel Lack in 2010.<sup>3</sup>

While primary care optometrists in the United States have been generally supportive of clinical interventions such as low plus lenses and vision therapy, the same cannot be said of primary care optometrists in the United Kingdom. The latter group is represented by The College of Optometrists in the U.K, and in the year 2000 they published the first issue of a quarterly review titled *Optometry*

in Practice (which coincidentally just announced that it is ceasing publication). That issue contained an article titled *Behavioural optometry – a critical review*, by Jennings<sup>4</sup> that was essentially dismissive of the field. That is, if one accepts that controlled clinical trials of management strategies are required to legitimize all areas of clinical endeavor.

Apparently not content that the Jennings review had laid the issue to rest about the credibility of behavioral optometry, *Ophthalmic & Physiological Optics* (OPO), the official journal of The College of Optometrists in the U.K., invited Brendan T. Barrett to do a critical evaluation of the evidence supporting the practice of behavioral vision therapy, which was published in OPO in 2009.<sup>5</sup> Citing the Jennings paper in his conclusion, Barrett wrote: “Although there are areas where the available evidence is consistent with behavioural optometry approaches (most notably in relation to the treatment of convergence insufficiency, the use of yoked prisms in neurological patients, and in vision rehabilitation after brain injury), a large majority of behavioural management approaches do not possess a solid evidence base, and thus they cannot be advocated ... Behavioural optometrists are enthusiastic advocates of their approach to optometry, and they seem to derive great satisfaction from the diverse work that they conduct. However, the continued absence of rigorous scientific evidence to support behavioural management approaches, and the paucity of controlled trials in particular, represents a major challenge to the credibility of the theory and practice of behavioural optometry.”

This seems to be a very odd conclusion on the heels of the section that precedes it. In particular, Barrett states that although double-blind RCTs (randomized clinical trials) represent the gold standard in the scientific testing of therapies/management approaches, not every form of therapy is amenable to the strictest RCT design. He acknowledges how difficult it can be to design and administer placebo treatments which participants in the control group deem as credible. He also acknowledges that strict RCTs are considered by many to be reductionist in the approach to therapy testing, because a key stipulation is that each

patient in the treatment group receives exactly the same treatment. "There is growing acceptance", he notes, "that such a reductionist approach may not always be appropriate".

Bowan's article published in *Optometry*<sup>2</sup> makes the point that there are five levels of evidence in evaluating the results of research:

- **Level 1 Evidence** – randomized double-blind, controlled studies of adequate size.
- **Level 2 Evidence** – smaller, randomized double blind studies with positive trends that may not be statistically significant.
- **Level 3 Evidence** – either non-randomized controlled studies or cohort or case series studies.
- **Level 4 Evidence** – expert opinions from acknowledged authorities.
- **Level 5 Evidence** – opinions from those who have merely studied and discussed the literature.

Barrett's statement above about research echoes a footnote in Bowan's paper: "There is acknowledgment among the review groups that RCT's cannot always be designed, and some areas may resist any form of quantitative study at all. A balance must be exercised between practical and ethical issues in deciding the quality of the evidence." This caveat comes to bear whenever there is consideration of the transfer of skills enhanced with optometric intervention to the academic environment. It is confounded by RCTs where the placebo therapy engaged in by a control group is considered to be "inert" relative to therapy undertaken by an experimental cohort, but in fact is not inert. David Cook discussed this extensively in analyzing the implications of why the CITT-ART did not appear to show that vision therapy was superior to placebo therapy with regard to reading improvement.<sup>6</sup>

The drive toward demanding Level 1 Evidence, however, continues unabated. Most recently, the OPO published an article by Fricke et al titled: "Does vision therapy for visual information processing improve academic performance? A randomised clinical trial".<sup>7</sup> Described as the first double-blind, randomized controlled trial on the effectiveness of

vision therapy for visual information processing (VIP) skills and its impact on academic performance, its outcome essentially came to the same conclusion for VIP skills as the CITT-ART did for accommodative and convergence skills. The authors stated that: "While practitioners may see improvements with vision therapy for visual information processing, our results suggest these are likely due to general, rather than specific, effects."

That conclusion is not surprising. In fact, given the lessons from CITT-ART, the conclusion was predictable. Let's take a look at the two groups in the VIP study. The experimental program components were designed to target the development of laterality and directionality, visual analysis and discrimination, sensory integration, visual coding, eye-hand co-ordination, visual span, processing speed, VSM and reading-related saccadic eye movement control. It was devised to test an intervention program that typified what was being employed in Australian pediatric optometry practices at the time of recruitment. In other words, it was shotgun or generalized therapy rather than individualized therapy designed to address VIP deficits presumably identified in a VIP evaluation.

On that note, there are several interesting observations:

1. Only one subtest (VSM) of the TVPS was administered. This is not standard practice, and the other subtests would be valuable in individualizing areas of therapeutic emphasis and documenting progress.
2. The DEM, a test involving saccadic eye movements was administered, yet none of the therapy activities in the experimental group focused on saccades - a key feature of eye movements in reading.
3. The TVAS was administered but not the TAAS. We'll revisit this below regarding differences in activities between the experimental and control groups.

The therapy procedures for the experimental program consisted of Body Lifts, Parquetry Blocks/Visual Matching, Clap Patterns, Racetrack, Directional Arrows and bdpq, Flashcards/Clap

Patterns, Angels/Coding, Letter Tracking, Space Training/Maps, and Groffman Visual Tracing. While that is a useful potpourri of activities, they are limited in terms of targeting areas in which individuals have key deficits that, when ameliorated, would be expected to transfer to improvement to their academic performance as compared to the control group. In addition, the ability of parents to implement these procedures at home could be subject to considerable variability despite having written directions. When considering evidence-based practice, it would not be surprising if appropriately trained and experienced vision therapists had better outcomes and transfer than family members or guardians.<sup>8</sup>

In that light, it is curious that the VIP study chose to have only home-based intervention. Although there has been no published study to my knowledge comparing office-based VIP therapy to home-based VIP therapy, one would expect the results to be comparable to the seminal CITT study showing a significant superiority for office based therapy.<sup>9</sup> A network meta-analysis of interventions for convergence insufficiency published in the Cochrane Database of Systemic Reviews in 2020 reiterated that office-based therapy was four to five times more likely to be effective than home-based therapy, which was no more likely than placebo to be effective.<sup>10</sup>

The second group in the VIP study, the control arm, received therapy designed to be inert relative to the experimental group. This assumption appears to be the same fundamental limitation of the study that plagued the CITT-ART study. In this instance the procedures selected were auditory/verbal phonic analysis exercises, binocular vision training exercises (accommodative flippers and Brock String), and gross motor and hand-eye coordination exercises.

It is not surprising that the study resulted in comparable transfer of improvement in the experimental and control groups. Auditory/verbal activities are crucial in visualization and visual imagery.<sup>11-13</sup> Brock String is described as a simple binocular vision exercise, but in behavioral optometry practices it is a complex tool that develops skills

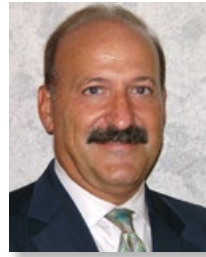
beyond fusion. It probes and develops divided attention, and relies upon and enhances executive function. As noted by Solan and colleagues, visual attention is an integral member of the basic learning triad that also includes memory and information processing.<sup>14</sup> Lastly, the authors state that the gross motor and hand-eye coordination exercises are theoretically more related to sport than to academic development. However, this minimizes the role of the cerebellum in reading, which research has demonstrated to be essential to the reading process.<sup>15-17</sup> This is crucial to recognize, because the hallmark of behavioral optometry, and what differentiates it from classical optometry, is the emphasis on the role of motor processes on visual development including VIP.<sup>18</sup>

In the final analysis, research is always welcome in advancing clinical practice but it must be positioned in its proper context. To propose that a clinical discipline such as behavioral optometry has credibility only if prospective, double blind RCTs support its efficacy is disingenuous. It ignores the fact that many many areas in ophthalmology and primary care optometry enjoy wide acceptance in the absence of Level 1 Evidence.

## REFERENCES

1. American Academy of Pediatrics. The Eye and Learning Disabilities. *Pediatrics* 1972;49(3):454-455.
2. Bowan MD. Learning disabilities, dyslexia, and vision: a subject review. *Optometry* 2002;73:553-75.
3. Lack D. Another joint statement regarding learning disabilities, dyslexia, and vision: A rebuttal. *Optometry* 2010;81:533-543.
4. Jennings, J. A. M. Behavioural optometry – a critical review. *Optom Pract* 2010;1, 67–78.
5. Barrett BT. A critical evaluation of the evidence supporting the practice of behavioural vision therapy. *Ophthal Physiol Opt.* 2009 29: 4–25.
6. Cook DL. The CITT-ART and the Art of Vision Therapy. *Vision Dev & Rehab* 2023; 9(2):85-126.
7. Fricke TR, Metha AB, Anderson DP, Lea AK, Anderson AJ. Does vision therapy for visual information processing improve academic performance? A randomised clinical trial. *Ophthalmic Physiol Opt.* 2023;00:1–11. [doi.org/kvvz](https://doi.org/kvvz).
8. Peachey GT, Peachey P. Optometric vision therapy for visual deficits and dysfunctions: A suggested model for evidence-based practice. *Vision Dev & Rehab* 2015;1(4):290-339.
9. Convergence Insufficiency Treatment Trial Study Group. Randomized clinical trial of treatments for symptomatic convergence insufficiency in children. *Arch Ophthalmol* 2008 Oct;126(10):1336-49. [doi.org/dgr8s9](https://doi.org/dgr8s9).

10. Scheiman M, Kulp MT, Cotter SA, Lawrenson JG, Wang L, Li T. Interventions for convergence insufficiency: a network meta-analysis. *Cochrane Database of Systematic Reviews* 2020, Issue 12. Art. No.: CD006768. <https://doi.org/gqn5dm>. Accessed September 10, 2023.
11. Forrest EB. *Visual Imagery: An Optometric Approach*. Santa Ana, CA:Optometric Extension Program Foundation, 1981.
12. Hellerstein LF. See It. Say It. Do It! The Parent's & Teacher's Action Guide to Creating Successful Students & Confident Kids. 2nd ed. HiClear Publishing, 2012.
13. Wieder S, Wachs H. *Visual/Spatial Portals to Thinking, Feeling and Movement: Advancing Competencies and Emotional Development in Children with Learning and Autism Spectrum Disorders*. New York: Profectum Foundation, 2012.
14. Solan HA, Larson S, Shelley-Tremblay J, et al. Role of Visual Attention in Cognitive Control of Oculomotor Readiness in Students with Reading Disabilities. *Journal of Learning Disabilities*, 34(2):107–118. <https://doi.org/c7nb3g>
15. Fulbright RK, Jenner AR, Mencl WE, et al. The Cerebellum's Role in Reading: A Functional MR Imaging Study. *Am J Neuroradiol* 1999;20(10):1925-1930.
16. Alvarez TA, Fiez JA. Current perspectives on the cerebellum and reading development. *Neurosci Biobehav Rev* 2018;92:55-66. <https://doi.org/gd5nvw>.
17. Li H, Kepinska O, Caballero JN, et al. Decoding the role of the cerebellum in the early stages of reading acquisition. *Cortex* 2021;141:262-279. <https://doi.org/gjxbmt>
18. *Applied Concepts in Vision Therapy 2.0*. LJ Press, MB Taub, PH Schnell, eds. Timonium, MD: Optometric Extension Program Foundation, 2022.



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