Book review

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Driving With Confidence
by Eli Peli and Doron Peli. Publisher: World Scientific Publishing Co. Pte. Ltd., River Edge, NJ, USA, 2002. $28/$18 (pbk). ISBN g81-02-4704-4/ ISBN g81-02-4705-2 (pbk)

Driving with Confidence fills a large gap in the low vision literature and provides a clearly written discussion of viable options and alternatives for driving with low vision. In addition, it offers the best compendium of the US States' requirements and restrictions for driver's licensing since Keltner and Johnson's survey of state licensing requirements (*Ophthalmology*, 1987). The first half of the book, divided into nine short chapters, is directed more towards the low vision patient. The audience for the second half, the appendices, includes both patient and low vision professional. The appendices include federal legislation relevant for those interested in driving with visual disabilities, sources for information about driving with compromised vision, low vision terminology and optical aids, and the tables containing the states' vision requirements. Although no formal statement is made as to the relevance of these materials for an international audience, low vision is certainly universal. Because countries outside the US are also dealing with these same issues regarding drivers with low vision and the use of optical enhancement devices, I believe the material contained in Peli and Peli would be of strong interest internationally.

Until now, patients with low vision have lacked a source of accurate information about driving. After reading this book, low vision drivers may even reconsider their commonly shared opinion that a disclosure to the state's licensing bureau means an end to driving privileges. Peli and Peli guide the patient who is experiencing a deterioration of vision toward taking an active and controlling role in decisions about driving by asking him/herself a series of questions such as: 'Can I continue to drive safely if I am extra careful?'; 'Must I report my condition to the DMV?'; 'Who should I talk to about this?'; 'My license is about the expire, am I going to be able to pass the vision test?'; and 'If my license is suspended or revoked, how should I respond and how will it affect my life?' The book is sensitive to patient needs in that it offers practical answers to these critical and often-asked questions.

The Peli and Peli book may also serve to inform professionals who may not have detailed knowledge of this area. Many low vision clinicians avoid the topic of driving with their patients, because it may not

be their area of specialty or because of a fear of litigation. Read with a professional filter, the authors provide some insight into the complexity of the topic of low vision and driving in Chapter 2, entitled 'Vision and Driving – Facts and Fiction'. This chapter explores the uninformed focus by licensing agencies on static visual acuity as being the main criterion measure for determining eligibility in driver's licensing, and reviews the relevant research evidence showing that visual acuity is only weakly correlated with safe driving.

I am in agreement with Peli and Peli, and most of the driving research world, on this point, namely, that visual acuity should not be the main indicator for safe driving. Peli and Peli appropriately argue that states may be incorrectly targeting static visual acuity as an isolated measure of visual function to the exclusion of other, more sensitive, measures such as dynamic visual acuity, peripheral visual field, glare recovery, contrast sensitivity, and attentional visual field. I disagree with their view that 20/40, the commonly used acuity criterion for state licensing without restriction, is *not* a key number. A drop in visual acuity from 20/20 to 20/40 in cases of refractive error may be inconsequential. However, in diseases such as glaucoma, macular degeneration, retinitis pigmentosa (RP), and diabetic retinopathy, a change to 20/40 is often an important flag to other losses. Losses that the authors point out could have serious deleterious consequences for driving, such as visual field loss, delays in glare recovery, and drops in contrast sensitivity. A visual acuity measure of 20/40 can provide a great deal of information in cases where eye disease is present.

Peli and Peli also clearly state that '. . . factors other than vision, such as poor judgment, overconfidence and greater risk-taking tendencies may be more conducive to unsafe driving.' This is also a statement that has a great deal of empirical support and cannot be overstated. It is widely known that driving performance relates to the interaction of clinical vision tests along with personal styles (e.g., risk taking, avoiding unfamiliar areas, driving at night) and behavioral measures (e.g., reaction time).

Peli and Peli mention that while peripheral visual field is related to driving performance, it is not known what extent of the field would be conducive to driving safety. I think it is important to note that *specific* relationships that occur between clinical vision measures and driving performance, often diluted in large-scale studies including the overall driving population (covered in Peli & Peli), are more obviously seen in studies that focus on patient groups representing a wide range of visual field, visual acuity, and contrast sensitivity losses. For example, evidence in our laboratory has shown that a measurement of less than 100 degrees in diameter to the Goldmann III-4-e target may be the point at which driving becomes problematic for patients with RP, who have vision of 20/40 or better. The use of disease models with discrete and well-characterized losses of vision could well serve us in identifying more exact relationships between vision parameters and performance.

Chapter 3 provides an excellent review of the medical aspects of the common eye diseases that often lead to low vision. My only comment

would be that the patient may benefit from reading Chapter 3 before Chapter 2, where these diseases are referenced. Chapter 4 asks the patient to actively evaluate their vision for driving by assessing their ability to detect and read objects and signs from the passenger seat, and then systematically review their options should they report problems in any of these areas. This chapter attempts to give the reader an honest sense of the persistence that is required in pursuing a legal license with compromised vision. Of note, the authors also highlight that drivers with a newly identified visual disability should seek out the training and guidance of a driver educator regardless of whether they are training with an optical enhancement device, because essentially they are learning a new task. Chapters 6 and 7 review the elements of training that are essential to success with optical enhancement devices and driving; exercises that cannot be appreciated by reading, but only by active participation in the task. The use of optical enhancement devices without training is not provided as an option, a concept with which I fully agree.

Peli and Peli discuss alternatives to driving in the final chapters such as cabs and public transportation. Low vision patients often rely on van services that are provided at no or minimal costs to legally blind individuals. These services, however, are currently overburdened, poorly run, or some combination of both. These factors prevent patients from getting to their destinations and make the loss of a drivers' license more burdensome. Clearly, all of these alternatives need to be improved before they are considered as viable options.

In the Appendices, the authors begin with a statement of the Rehabilitation Act that prohibits the exclusion of individuals with disabilities from participating in, being denied the benefits of, or being discriminated by any program receiving federal aid. Peli and Peli note that departments of motor vehicles, as state agencies receiving federal assistance, must respect this law. If one contemplates the magnitude of this Act, it is clear that state agencies need to become more consumer-oriented and better equipped to deal with the numbers of low vision drivers that they will be faced with as the baby boomers age. There needs to be the global recognition that better screening tests need to be developed, along with a better system for the assessment of drivers with optical enhancement devices. In other words, major changes need to take place within state licensing structures to address these concerns.

Lastly, the authors review some of the most useful low vision aids for driving. What is clear is that we, as a research community, have a better understanding of the effectiveness of bioptic telescopes for driving and the advantages and disadvantages of these devices, which for the most part may be overcome with proper training. In reviewing the options for peripheral visual field enhancement, the wide gaps in our knowledge and the need for research are obvious. Peli and Peli report on the study that was conducted in our laboratory where we investigated the use of an Amorphic Lens (formerly developed by Designs for Vision Inc.) in a bioptic configuration to be used only for spotting purposes. Peli and Peli correctly mention that there was improvement measured in driving simulation. However, they do not address the fact that the

patients demonstrated improvement under real-world driving conditions as well, and that those with greater visual field losses showed greater improvements in some skills.

Peli and Peli further proceed with a discussion of the use of prism lenses and visual field awareness systems for driving with hemianopia. They note that these devices for driving have not been formally evaluated in studies. Interestingly, in a recent study in our laboratory,[1] we compared the use of Fresnel prisms with the ground-in prism-based Gottlieb Visual Field Awareness System for real-world driving in 11 patients with hemianopia, using a cross-over design study where all subjects were trained with both systems. We found improvement beyond a test-retest criterion for all visual skills including recognition, mobility, peripheral detection, scanning, tracking, and visual memory with both prism systems. We reported that there were no consistent differences between improvement with the Gottlieb system compared to the Fresnel prisms. However, the patients reported that they preferred the Gottlieb system for its aesthetics. All but one of seven patients contacted were still using it at a one-year follow-up, where none were still using the Fresnel system. What is more important is that two of the study's hemianopic patients were granted licenses by the state to drive with the restriction to drive only with the Gottlieb system.

This pilot study provides some insight into the issues that need to be considered in developing useful peripheral enhancement systems. Peli and Peli address what they believe to be a major issue related to the use of prisms, diplopia, which they overcome by altering the configuration of the prisms on the carrier lenses. Our patients did not voice much complaint about the diplopia, perhaps because the training was focused on using the prism system as a peripheral detection system cueing them to move their heads and then view with their spared macular vision.

In summary, there have been some initial attempts to measure the effectiveness of peripheral expansion devices, optical enhancement devices in general, and the outcomes of training methods. Peli and Peli are involved in some of the most innovative research working towards the goal of perfecting these systems and training techniques. However, we are miles away from the research that is required to properly design the programs necessary to meet the needs of the vision-compromised American Public, whose right it is to be recognized by state licensing agencies. Peli and Peli's book does a great job of showing us where we presently are in driving with low vision. This reader is left pondering the many roads for research in this field yet uncharted.

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[1]Szlyk & Seiple, reported at Lighthouse International's Vision '99 International Conference on Low Vision, Final Report for Project #C754-2RA-Evaluation of Central and Peripheral Vision Enhancements for Driving, Department of Veterans Affairs, Rehabilitation Research & Development Services, Washington, DC.