PROJECT FACT SHEET

Understanding Amblyopia

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Dr. Kevin Duffy, Associate Professor in the Department of Psychology at Dalhousie University, has been investigating a vision problem called Amblyopia, commonly known as “lazy eye.”

Lazy eye occurs when normal vision fails to develop during early childhood. If the condition persists throughout early life, the consequent vision impairment is untreatable by surgery or by corrective eyewear. According to the Canadian Association of Optometrists, about 4% of Canadian children suffer from some form of amblyopia.

“Amblyopia can result from a cataract on a newborn’s lens, or from other eye conditions that block normal vision.” explains Dr. Duffy, ”This loss of vision is caused by abnormal development of brain connections (this should be deleted because it’s wrong, connections are not called neurons) in the areas of the brain that serve vision. Clear, unobstructed vision is required to promote proper development of brain regions that enable normal visual function.”

Dr. Duffy’s research on amblyopia and brain development addresses fundamental questions in systems neuroscience. “Understanding the principles of brain development would seem to be a critical step in understanding the cause of amblyopia and perhaps other sensory impairments, but may also provide insight into how the brain can be altered by its experience,” comments Dr. Duffy.

Dr. Duffy’s interest in this research began while he was a post-doctoral fellow at Harvard Medical School, where he had the opportunity to work with Dr. David Hubel, a fellow Canadian and winner of the 1981 Nobel Prize in Medicine. “The many conversations I had with Dr. Hubel certainly piqued my interest in vision, and in the cellular processes underlying its development. It’s hard not to get excited about science when you’re in that kind of environment, “says Duffy.

The funding received by Dr. Duffy through the NSHRF’s Health Research and Matching Grants program has allowed him to better understand the brain’s response to abnormal vision that causes changes visual function.

“Interventions designed to alleviate the symptoms of amblyopia are faraway, but we seem to be on the right track toward understanding its cause,” comments Dr. Duffy.

“Without NSHRF funds it would have been difficult to build my lab, fund my students, and start my research program at Dalhousie,” admits Dr. Duffy,” This funding was critical in providing a

means to pursue my interests in vision research, and played no small part in shaping my career during its most formative years."

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