**The Effect of Spectral Filter Eyeglass Lenses on Adults with ADHD and Irlen Syndrome: Does This Intervention Change the Attentiveness Profile?**

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**Abstract**

Irlen Syndrome (IS), involving difficulty in visual processing, shares symptoms with ADHD. This study examines whether using spectral filter eyeglass lenses )SF( improves individuals’ attentiveness profile.

Methods: 39 adults aged 18–50, diagnosed with ADHD and IS, were fitted with SF (research group) while two (control) groups were not (n=20\*2). Two research tools were used: an auxiliary tool for ADHD diagnosis—MOXO-CPT(D)—and a DSM-5 ADHD questionnaire.

Results: Significant improvement in attentiveness index was found in the research group relative to control groups. In the short-term, the attentiveness profile for 50% of the research group changed, displaying no symptoms of the disorders; in the long-term, 71% changed. Pursuant to the use of SF, 50% of the research group improved continuous attentiveness and did not show fatigue, in contrast with the control groups.

Conclusions: Perceptible improvement in attentiveness index and change of attentiveness profile among at least 50% of those examined suggests the possibility of false ADHD diagnosis due to the comorbidity of IS and ADHD, indicating that differential diagnosis is needed.

**Keywords:** Attention Deficit Hyperactivity Disorder, Irlen Syndrome, spectral-filter lenses, differential diagnosis, reading difficulties, fatigue, continuous attentiveness, comorbidity, specific learning disorders

Throughout our years of experience in research, diagnosis, and treatment of people with Irlen Syndrome (IS), we have encountered many individuals with additional disorders, such as specific learning disorders in reading as well as attention deficit hyperactivity disorder (ADHD). Many of these individuals, after being diagnosed with IS and fitted with spectral filter (SF) lenses, experienced an enormous improvement in attentiveness along with improvement in their reading and depth perception, and a decline in headaches and fatigue. Their testimonies prompted us to investigate these two syndromes in an attempt to understand their comorbidity and determine whether differential diagnosis of IS and ADHD can be found.

ADHD, a widely encountered disorder caused by impaired brain functioning, leads to attention difficulties, impulsivity, and hyperactivity. It is common among adults, and its symptoms manifest differently with age (Fletcher, 2014). The onset of symptoms generally occurs by age twelve. Some believe that 2.5% of all adults have been diagnosed with ADHD (Kolodny, Ashkenazi, Farhi Shalev, 2017; Simon, Czobor, Balint, Meszaros & Bitter, 2009; Vitola et. al., 2017; López-Pinar et al., 2020). The prevalence of ADHD among adults has increased over the years (Barkley, Fischer, Smallish & Fletcher, 2006).

Numerous studies have used brain scans to try to understand the determinants of ADHD and have identified the frontal cortex as the main area of impairment causing ADHD (Dickstein et al., 2006). However, in recent years, studies by means of FMRI have yielded findings that demonstrate impairment in additional areas of the brain. The most recent studies relate to neural networks, which connect various regions of the brain (Hale et al., 2017), rather than focussing on specific areas. A groundbreaking meta-analysis that examined FMRI-facilitated ADHD studies identified the visual variable as a meaningful element in ADHD (Cortese et al., 2012).

Diagnosing ADHD can be difficult, particularly among adults, due to comorbidity with other disorders and phenomena. ADHD displays high comorbidity with learning disorders (DSM-5; American Psychiatric Association [APA], 2013) and other psychiatric disorders (Horning, 1998; Weiss & Hechtman, 1993, p. 408, in Schoechlin & Engel, 2005). In 50%–60% of adult ADHD cases, clinical and psychosocial difficulties are encountered (Knecht et al., 2015; London & Landes, 2016; Young & Goodman, 2016).

Apart from what we know about comorbidity with ADHD, there is evidence that this disorder may be accompanied by secondary effects such as risk-taking, anxiety, psychological disorders, extreme moods, and depression (Schoechlin & Engel, 2005). Among adults, the complexity of identifying ADHD symptoms relative to other illnesses makes it harder to apply differential diagnosis, because the symptoms exhibited by adults are less obvious and specific than they are in children; symptoms tend to be masked by many other phenomena (Quintero, Morales, Vera, Zuluaga & Fernández, 2019). Another complicating factor in diagnosis among adults is that the adult evaluation questionnaire is based solely on self-report, whereas for children, additional reports are gathered from teachers and parents The importance of differential diagnosis of ADHD in adults has implications not only for the quality of life of those affected but bear weighty social and economic implications as well (Knecht et al., 2015; London & Landes, 2016; Young & Goodman, 2016).