

DOMD and FOMD

Introduction

Fine visuomotor control problems can be classified under two categories, developmental or functional. As a result, they are sometimes referred to as DOMD (Developmental Oculomotor Dysfunction), or FOMD (Functional Oculomotor Dysfunction), respectively. In either case, they are a reflection of a child's deficient level of visuomotor skill compared with the visual tasks put before him.

From "Developmental & Perceptual Assessment of Learning-Disabled Children: Theoretical Concepts and Diagnostic Testing", Sidney Groffman & Harold Solan, p8

"... the concept of automaticity [is expanded] into a theory of development that differentiates problems in *learning to read* from *reading to learn*. ... development is the acquisition of an increasingly complex repertoire of automatic neural processes or schemata that enables the individual to move from conscious to automatic response. As development continues, more complex schemata become available that allow the individual to perform higher level tasks at an automatic level. Although skills are originally organized under conscious control, repetition with self-correction (sensory-motor feedback) leads to automaticity. When an episode such as hypoxia or trauma interferes with the developmental process, then a developmental anomaly results, and a *learning to read* problem may exist concurrently."

"In contrast to a developmental disability, a functional deficit exists when pre-existing automaticity breaks down due to a physiological fatigue, emotional stress, or even the cognitive load of the task, and processing reverts to a conscious level. This type of regression to a lower order processing system frequently takes place in the oculomotor system and involves reading and writing. Since the oculomotor system is part of the reading/writing automatic schemata, the resulting blur or diplopia requires a conscious override. Functional deficits most often cause a *reading to learn* problem."

DOMD, then, is seen as a result of slow, delayed, or absent neurodevelopmental pathways that enable acquisition of fine motor skills. In these cases, the child did not have the benefit of appropriate development during formative years, and this for genetic or environmental reasons. Children with DOMD are more likely to show difficulty with lower level motor functions, such as balance, coordination, bilateral integration, and directionality. FOMD represent more of a skill-level concern than a developmental concern. Children with FOMD will often have the benefit of strong development, but do not have the refined motor skills required for reading related tasks – this may be due to lack of experience with and exposure to reading, and/or lack of exposure to physical activity that would promote these.

Therapy around DOMD and FOMD will be very similar and begin with low-level motor training and integration, followed by work in higher motor and cognitive functions. DOMD will require more work at the lower motor levels prior to moving on, while

FOMD cases will typically advance more quickly to therapeutic activities more aligned with typical classroom demands, such as higher-level skills.

The Value of Observing Saccades, Pursuits, and Fixations

Gross motor control concerns include alignment (are the eyes targeting the same targets), and posture (do the eyes tend to stay on target, or do they want to drift inward or outward). Fine motor control includes saccades, pursuits, and fixation. Gross motor development evolves prior to refinement of fine motor skills and is anatomically and functionally significant as it can pose significant obstacles to targeting and lead to unneeded excess strain. Fine motor control, for its part, allows for some insight into the developmental status and reading readiness of a child.

There are specific reasons why we assess function of these three fine motor activities. Monitoring and measuring saccades, those quick lateral jump movements of the eyes, are clearly significant in rapid automated targeting required for reading text. It seems intuitively obvious that if a child is struggling with rapid targeting of letters and words, for example, that there will be problems with fluid reading. This can sometimes manifest as reversals, repeated lines, and skipped lines. Saccades are likely more relevant in the classroom than pursuits, as children are rarely asked to smoothly follow objects, but are much more likely to be tasked with reading.

Fixation maintenance and pursuits are valuable indicators of overall neurodevelopmental status. Fixations, for the purpose of this discussion, can be seen as an extension of pursuits as a corroborating test elements. As mentioned, these visuomotor control elements are not critical for classroom performance per se, but they are indicators of underlying factors that will influence skills that are more critical for academic success. For example, a child might have adequate pursuits, but difficult saccades. This is more likely to point to developmental concerns that require more therapeutic work at a lower level. Children with insufficient pursuit and fixation control are likely exhibiting visual spatial attention difficulties that need to be addressed as part of therapy in conjunction with work to develop saccadic accuracy. Deficits in pursuit and fixation maintenance are likely to point to other underlying gross motor concerns such as trouble with balance, and bilateral integration.