NeuroTracker and Attention Flexibility

**Attentional flexibility** is the ability to switch mental focus from one thing to another. An act as simple as a conversation requires us to switch fluidly between listening, evaluating what we hear, crafting a response, and then speaking. A high-stakes situation might require us to rapidly switch attention between tasks, objects, numbers, sounds, scenes, and thoughts—all within a few seconds.

Shifting attention from one thing to another is extremely cognitively demanding because it takes extra processing power, and during the switching process our quality of attention decreases. This effect is known as a **switch deficit**. With training, it is possible to improve quality of attention and reduce switch deficit. NeuroTracker is an effective training tool for attentional flexibility because human performance experts designed it to target the three major domains of attention switching, all at the same time.

Three domains of attentional flexibility

**Narrow vs. Wide**: Switching attention between thinking on a macro scale to a micro scale, or vice versa

Think of a goalie in hockey. As the offense advances the puck toward him, he maintains **wide focus** on the positioning of the entire opposing team. At that time, his priority is to make sure he is not caught out of position. The moment a player attempts a shot, he immediately switches to an extremely **narrow focus** on the puck because at that moment his only priority is to save the shot. Switching between narrow and wide focus is not always related to visual attention—it refers to anytime we switch the scale of our attention.

**Internal vs. External**: Switching attention between our own mind or body (internal focus) and the environment (external focus)

Think of a running back in football. As he takes the handoff, he **focuses internally** on controlling his muscles to secure the football. He immediately switches to **external focus**, so he can evaluate his blocking and choose a gap to explode through. As he goes through the gap, he takes a small hit and has to switch immediately to **internal focus** as he fights to keep his balance. After he has stabilized himself, he switches back to **external focus** so he can attempt to evade the second level of the defense.

**Task-based**: Switching between different kinds of attention depending on the situational need

Think of a race car driver. As he accelerates down a straightaway, he is primarily focused on using **visual attention** to make sure he can take the proper angle on the upcoming curve. As he gets a radio communication from his pit crew, he switches his focus to **auditory attention** so he can listen and evaluate what he is being told. As he downshifts going into the curve, he uses a combination of **tactile and auditory attention** to make sure his engine is performing the way he needs.

Why NeuroTracker?

NeuroTracker challenges the user to fixate attention on four of eight spheres moving randomly through a 3D virtual cube. As they move through the cube, spheres will collide with one another and cross paths, forcing the user to engage **working memory**, **acu stereoscopic processing**, and **trajectory prediction** at various points. Only by employing **task-based switching** between these different brain functions can the user successfully maintain attention without losing any of the four targets.

When NeuroTracking, the user constantly switches between **narrow and wide focus**. At some points, the four targets will be spread out and moving freely, requiring **wide focus**. Less than a second later, three target spheres might collide with a fourth sphere, forcing the user to **narrow focus** rapidly in order to carefully observe the collision without losing track of the targets. Immediately after the collision, the user will switch back to **wide focus** in order to track the entire scene.

NeuroTracking also reveals micro lapses of attention, which can be critical to performance but typically go unnoticed. Losing track of even one of the four targets almost always results in a failed trial. When a user loses track, they immediately **focus internally** on the mental error responsible for the lapse in attention. Being able to successfully control attention and switch between **internal awareness** and **external tracking** is a key skill for those who want to perform under pressure.

Finally, NeuroTracker has a suite of **advanced modes** to constantly challenge attentional flexibility. Experienced users will not only track their four targets, they will also avoid a virtual collision or deflect a virtual ball. This adds a variety of motor and cognitive loads on top of an already-demanding attention task. Advanced sessions engage **coordinated motor skills**, **optic flow timing**, and even extra processing of **auditory cues** and **audio responses to personal interactions with the virtual environment**.

Bottom line: NeuroTracker gives users a way to practice the **mental juggling** necessary to succeed in high-stakes situations. It trains users to **deploy their attention precisely and rapidly** because the demands in the moment are constantly changing. By design, it finds users’ attention thresholds quickly and focuses the training at users’ thresholds for maximum effectiveness. Success in the most demanding situations requires **attentional flexibility** and there is no better tool than NeuroTracker to train it.