ISSUE 3, VOLUME 11 · MAY 17, 2024

FRIENDS OF NVT

OFFICIAL NEWSLETTER OF INNEURACTIVE

INTRODUCTION

Welcome to Issue 3, Volume 11 of the Friends of NeuroVisual Training Newsletter. In this issue, we delve into the profound impact of NeuroVisual Training (NVT) on enhancing attentional capacities, a vital aspect of cognitive function. As we explore the realm of attention, our focus turns to the groundbreaking possibilities NVT holds for individuals with Attention Deficit Hyperactivity Disorder (ADHD) and similar conditions. The science behind NVT not only broadens our understanding of cognitive development but also offers practical applications that can dramatically improve daily living.

Our feature article, “NVT as a Potential Non-Pharmacological Approach to Refine Focus/Attention in ADHD Diagnosed Individuals” sheds light on the latest research and real-world applications of NVT designed to strengthen attentional control. This exploration is especially pertinent for those who navigate the challenges of ADHD, providing them with tools and techniques that are both innovative and accessible.

Complementing our main discussion, the ‘How To’ section of this newsletter presents practical guidance on Divided Attention tasks. Here, we provide detailed, no-cost instructions for implementing NVT drills that utilize resources like the Dynavision D2 Light Board among others. These exercises are tailored to improve divided attention skills, offering valuable strategies for therapists, educators, and individuals keen on enhancing their cognitive toolkit.

Join us as we dive deep into the science and strategies of attention enhancement through NVT, equipping our community with knowledge and skills to transform cognitive challenges into opportunities for growth. Together, let's continue to push the boundaries of what's possible in cognitive health and wellness.

WHAT'S IN OUR LATEST ISSUE:

@FriendsofNVT

NVT as a Potential Non-Pharmacological Approach to Refine Focus/Attention in ADHD Diagnosed Individuals

ADHD is a neurodevelopment disorder that affects around 5-10% of school-aged children and is estimated to impact 5% of American adults. In the landscape of ADHD treatments, where pharmaceutical interventions often take precedent, there is a silent revolution taking place that leverages the brain's remarkable plasticity to help ADHD diagnosed individuals focus, control impulses, and improve multi-tasking.

NeuroVisual Training (NVT) is a non-pharmacological approach that aims to enhance focus and attention by tapping into the intricate connections between vision and cognitive function. Unlike traditional methods that directly target symptoms, NVT has a heightened focus on addressing the root causes of attention deficits. NVT offers a promising avenue for individuals seeking alternatives to medication.

In this article we'll explore the network dynamics that are associated with ADHD individuals, take a look at the multisensory problem children of the future are facing, and how NVT can be applied to re-wire these networks through fun and engaging real-world exercises.

Connectivity & Network Dynamics

Connectivity and network dynamics refers to the understanding of how different brain regions communicate and coordinate with each other. It's the study of how these patterns of connectivity may be altered in individuals with ADHD. There are two primary networks we'll be focusing on in this article, **attention networks** and **executive function networks**, but please understand it's more complex than the two networks we're isolating today.

Attention Networks

- Dorsal Attention Network – composed of the intraparietal sulcus and frontal eye fields (parietal lobe / frontal cortex).
- Ventral Attention Network – composed of the anterior insula and dorsal anterior cingulate (cerebral cortex & frontal part of the cingulate cortex).

In ADHD individuals, studies have shown disrupted connectivity between these two attention networks, contributing to difficulties with maintaining attention and cognitive control.

Executive Function Networks

- The Frontoparietal network and the cingulo-opercular network are important for executive functions such as memory, cognitive control, and task monitoring.

Irregularities in these networks can lead to challenges for individuals ranging from executive function to self-regulation. We'll look at how giving a 2-year-old an iPad can impact these networks and lead to ADHD-like symptoms.

The Multi-Sensory Problem

It is common practice in 2024 to give a small child an iPad or mobile device to play with from a very young age. From a neurodevelopmental standpoint, exposure to these devices overstimulates the young child's mind in many ways through the presentation of sounds, sights, colors, prompts, and physical contact with the device.

The barrage of stimuli can be engaging and entertaining. However, these stimuli can overwhelm a young child's developing sensory systems which can lead to sensory overload making it challenging for the child to filter out distractions and focus on specific tasks.

Traditional learning activities have encouraged sustained engagement and gradual skill development which is a stark contrast to modern digital media. Frequent scene changes and interactive prompts, while engaging and fun, can inadvertently train children to expect instant gratification and struggle with maintaining focus. Screen time can also interfere with development of self-regulation skills, such as impulse control and the ability to control attention. Children can become used to the instant feedback and constant stimulation provided by mobile devices, making it challenging for them to transition to activities that require patience, persistence, and delayed gratification.

Contrary to hands-on play or real-world interactions, screen time promotes passive consumption. Children may become passive observers rather than active participants in their learning experiences, which can negatively impact their ability to sustain attention and engage with their surrounds.

It is paramount to understand that multi-sensory overload from a young age can directly impact how that child will handle and process new information as they get older. NVT serves as a potential training substitute for screen-based and pharmaceutical ADHD interventions because it focuses on real-world tasks, involves delayed gratification, and is fun and engaging for children.

NVT Exercises For ADHD

When developing a NVT program for an ADHD diagnosed individual, it's important to take stock of which networks appear to be disrupted and then use that information into a menu of exercises. To improve multisensory processing skills, Marsden Balls serve as a great tool because they're scalable in complexity, safe, and extremely fun to use. But the trick to making this a more ADHD-specific drill, we want to use multiple servers so that the individual must switch back and forth while processing the shapes and colors and using the correct catching protocol. Typically, we see that individuals who struggle with maintaining focus on a task will stop calling out the shapes and colors, and rather just go about the catching the balls.

Spatial reasoning is a critical task for all humans to condition us as to where we are in space, how to move throughout a 3D world, and to engage in play activities such as bicycling and ball toss. Media cannot compete in a 3D world as the media takes place on a 2D screen. However, since screen time engages the individual in a 2D world, causing them to stay on it longer, the screen can work to detrain or delay development of the parietal lobe. A key area involved in spatial awareness. NVT training that involves spatial awareness training in conjunction with a 3D activity such as pitch & catch will aid in training the brain and parietal lobe.

A component of the concept of engaging NVT for individuals with ADHD is to enhance the sensory stimulation they receive. This enhancement of the sensory stimulation from the 3D 'real world' is thought to aid in processing and task maintenance. A theory herein is that when some ADHD individuals learn to better process and better absorb information from the 3D world, they will be better able to engage in that 3D world and have less manifestation of some aspects of their ADHD diagnosis.

The Future

NeuroVisual training emerges as a promising non-pharmaceutical intervention for enhancing focus and attention in individuals with ADHD. Leveraging our brains' remarkable plasticity and the intricate connections the brain has may aid in mitigating some of the impact of ADHD. We believe that the 3D world can compete with the media-based activities when NVT trains the brain to integrate more and more of the visual and auditory information around us.

Enhance Your Focus: Practical Divided Attention Tasks for Better Performance

Humans often pride themselves on their ability to multitask, yet research consistently shows that our capacity for handling multiple tasks simultaneously is not as proficient as we might like to believe (Suija-Markova, et al. 2020). This limitation becomes even more pronounced in high-pressure environments such as sports, where the demand for rapid decision-making and physical coordination is heightened (Meet, et al. 2019). In sports settings, athletes must process complex information and make split-second decisions while physically executing skills, which can significantly strain their cognitive resources.

The challenge intensifies as athletes try to "think" or "process" under duress, leading to decreased performance and increased error rates. This is where targeted training like divided attention tasks comes into play. By systematically improving an athlete's ability to manage multiple cognitive and physical demands, we can enhance their performance under pressure. This type of cognitive training is crucial not only for athletes but for anyone looking to improve their ability to efficiently juggle multiple tasks in dynamic and demanding environments.

For individuals with ADHD, who often struggle with attention regulation, divided attention tasks can be particularly beneficial (Karatekin, et al. 2008). ADHD is characterized by difficulties in maintaining focus, especially on multiple stimuli or tasks at once, which can significantly disrupt daily functioning and learning. Divided attention training can help mitigate these challenges by enhancing the brain's ability to allocate attention more effectively across various inputs. By engaging in exercises that require simultaneous processing of multiple tasks, those with ADHD can develop stronger cognitive control and improve their ability to manage competing demands (Caldani, et al. 2019). This training not only aids in academic and professional settings but also helps in managing social interactions and other daily activities where multitasking is inevitable.

Now that we understand the critical role divided attention tasks can play in enhancing cognitive flexibility, it's time to put theory into practice. Follow these detailed steps to utilize the Dynavision D2 Light Board, a tool that challenges and improves your ability to manage multiple tasks simultaneously.

Divided Attention Task for Individuals with ADHD Using the Dynavision D2 Light Board

Objective: Improve the ability to manage and respond to multiple stimuli simultaneously, enhancing cognitive flexibility and reaction time.

Materials Needed:
Dynavision D2 Light Board
T-Scope function enabled

Exercise 1: Acclimation Task

1. Goal: Hit as many buttons as possible.
2. Duration: 1 minute.
3. Instructions:
    a. Stand comfortably in front of the Dynavision D2 Light Board.
    b. When a light activates, quickly press it to turn it off.
    c. Continue this process for a duration of one minute, aiming to press as many lights as possible.
    d. Repeat this exercise twice to ensure full acclimation to the task, totaling two minutes of activity.

Exercise 2: Advanced Multitasking Divided Attention Drills

1. Goal: Hit as many buttons as possible while simultaneously performing a cognitive task using the T-Scope function.
2. Duration: 1 minute per drill, repeat 3-5 times based on the participant's ability.
3. Instructions:
    a. Begin each drill by standing in front of the Dynavision D2 Light Board with the T-Scope function activated.
    b. Select a cognitive task on the T-Scope, which could be solving math problems, calling out words that rhyme with those displayed, or describing images shown.
    c. Start the drill. As you focus on hitting the lights on the board, also attend to the cognitive task:
        i. Math Problems: Solve the problem displayed and verbally provide the correct answer.
        ii. Word Rhymes: Call out a word that rhymes with the one shown on the T-Scope.
        iii. Image Description: Briefly describe or relay information about the image displayed on the T-Scope.
    d. The primary task is to hit as many buttons as possible. The secondary task is to respond accurately to the cognitive challenge.
    e. Ensure clear and loud verbal responses for the cognitive tasks, which adds an element of speech and auditory processing to the drill.
    f. Continue for one minute, then take a short break (30 seconds to 1 minute) before repeating. Perform this drill 3-5 times depending on the participant's endurance and skill level.

General Tips:

- Ensure the participant is focused and ready before starting each drill.
- Adjust the difficulty of the T-Scope tasks according to the participant's performance, gradually increasing complexity as their multitasking abilities improve.
- Monitor the participant's fatigue levels and adjust the intensity and duration of the drills accordingly.

This program is designed to not only enhance the physical reaction times but also significantly improve cognitive processing under pressure, making it highly beneficial for individuals looking to improve their divided attention skills in high-demand environments.

Advanced Divided Attention Task for Basketball Players using the Dynavision D2 Light Board

Objective: Enhance multitasking abilities, reaction time, and cognitive-motor integration in a dynamic, sport-specific context.

Materials Needed:

- Dynavision D2 Light Board
- Basketball

Drill Setup:

1. Goal: Improve coordination and cognitive response by switching hands for dribbling and button pressing based on the color of the illuminated button.
2. Duration: 1 minute per drill, repeat 3-5 times based on the athlete's ability.
3. Instructions:
    a. Stand in front of the Dynavision D2 Light Board with a basketball.
    b. Configure the Light Board to illuminate red and green lights randomly but not simultaneously.

Drill Execution:

1. Starting Position:
    a. Begin dribbling the basketball with either hand at a comfortable pace.
2. Task Execution:
    a. Red Light Activation: When a red light appears, the athlete should dribble the basketball with their left hand and use their right hand to press the red button as quickly as possible.
    b. Green Light Activation: When a green light appears, the athlete must switch the dribble to their right hand and use their left hand to press the green button.
3. Duration and Repetition:
    a. Continue the task for one minute, focusing on quick, accurate responses and maintaining control of the basketball.
    b. Take a short break (30 seconds to 1 minute) to reduce fatigue and maintain high performance.
    c. Repeat the drill 3-5 times, adjusting the speed and frequency of the light activations based on the athlete's proficiency and stamina.

Advanced Modifications:

- Speed Increase: Gradually increase the speed of light activations as the athlete becomes more proficient, challenging their reaction times and decision-making under pressure.
- Complex Dribbling Patterns: Introduce more complex dribbling patterns or movements, such as crossover or behind-the-back dribbles, to further challenge the athlete's coordination and cognitive load.

General Tips:

- Ensure the athlete remains focused on accuracy and form, especially as fatigue sets in.
- Use verbal cues to remind the athlete of the task requirements if they begin to default to simpler patterns under cognitive load.
- Monitor the athlete's technique and fatigue levels closely, adapting the drill intensity and breaks to optimize performance without risking injury.
- This drill is designed to simulate the dynamic decision-making and motor skills needed in basketball, making it an excellent training tool for athletes looking to enhance their performance on the court through improved cognitive and physical agility.

This drill is designed to simulate the dynamic decision-making and motor skills needed in basketball, making it an excellent training tool for athletes looking to enhance their performance on the court through improved cognitive and physical agility.

If there are any comments, concerns, or requests for specific drills to support the people your team works with, please feel free to reach out to us at any time!

References:

Caldani, S., Razuk, M., Septier, M., Barela, J. A., Delorme, R., Acquaviva, E., & Bucci, M. P. (2019). The effect of dual task on attentional performance in children with ADHD. Frontiers in Integrative Neuroscience, 12. https://doi.org/10.3389/fnint.2018.00067

Karatekin, C., White, T., & Bingham, C. (2008). Divided attention in youth-onset psychosis and attention deficit/hyperactivity disorder. Journal of Abnormal Psychology, 117(4), 881–895. https://doi.org/10.1037/a0013446

Meet, Nagda., Amritashish, Bagchi., Anshika, Verma. (2019). Effects of Multitasking on the Performance of a Team Captain at an Elite Level in Sports. Annals of Tropical Medicine and Public Health, 23(17) https://doi.org/10.36295/ASRO.2020.231727

Suija-Markova, I., Briede, L., Gaile-Sarkane, E., & Ozoliņa-Ozola, I. (2020). Multitasking in knowledge intensive business services. Emerging Science Journal, 4(4). https://doi.org/10.28991/esj-2020-01233

Announcements

Please check out the new brain supplement Tricerapro. https://tricerapro.com/. This is a great tasting powder that you mix with water to boost brain energy metabolism.

As always, please also check out our store, http://www.inneuractive.com/shop ! We regularly add new products and are excited for the upcoming launch of our NVT warmup panels, and the Speed of Accommodation and Processing software platform.

We encourage our Friends of NeuroVisual Training community to engage with these enriching resources. Your commitment to staying updated fuels the advancement of our field, and for that, we are sincerely appreciative.

~~~~~~
~~~~~~