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FRIENDS OF NVT

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INTRODUCTION

Welcome to Issue 8, Volume 11 of the Friends of NeuroVisual Training Newsletter!

In this edition, we delve into the expansive field of sports performance enhancement through the lens of NeuroVisual Training (NVT), with a focus on brain, vision, perception, and cognitive development. Our feature article, *"Evidence for and Against NeuroVisual Training: Proximal and Distal Benefits in Sports Performance—An Op-Ed,"* explores the ongoing debate around NVT's effectiveness. We present both supporting studies and critical viewpoints, examining the nuanced relationship between immediate benefits, like improved task proficiency, and long-term gains, such as enhanced athletic performance and injury prevention.

We also introduce the Hercules System, Inneuractive's cutting-edge training platform that enhances athletes' visual and cognitive abilities with sport-specific customizations. In the "Speed of Accommodation and Processing" section, we discuss how this innovative system hones essential skills like speed of accommodation and split attention, giving athletes a competitive edge in sports like soccer and hockey.

Join us in this thought-provoking issue as we continue to explore the dynamic intersections of NeuroVisual Training, sports performance, and cognitive enhancement.

WHAT'S IN OUR LATEST ISSUE:

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Evidence for and against NeuroVisual Training Having Proximal and Distal Benefits in Sports Performance Enhancement: An Op-Ed

For this and future Friends of NVT newsletters we will include many things in the NVT umbrella regarding sports performance enhancement. This will include brain training, Vision training, Perception training, Cognitive training and a host of other activities that some sports performance training coaches may engage in. We also generally talk about benefits in two continuous phases. Proximal benefits where the athlete learns how to do the tasks like Saccades (I2V2), Brock string (I2V5), Light board (I2V4), and others [3]. Proximal tasks see learning effects with improved proficiencies and improved scores. Distal benefits are where the athlete improves in the performance of their craft. This can include individual performance enhancement, such as batting averages [2,6]. Or it can include more wins for the team as an aspect of performance enhancement. Also, for the sake of this article, we will include injury prevention as a performance enhancement parameter or a distal benefit. We feel that injury risk mitigation is a performance parameter [4].

There is controversy and murkiness associated with NVT (Neurovisual Training) for sports performance enhancement. A small study using the Nike Sparq system assessed head impacts in high school football players and concluded that visual training did not reduce the likelihood of sustaining higher magnitude head impacts. However, it's important to clarify that this was not a vision training study but rather an assessment study. The authors projected their findings onto the idea that training to improve these abilities would not be helpful, but this is a questionable leap. Additionally, it is noteworthy that the same group of authors reported opposite findings in a separate study using a different patient population that was not published.

More significantly, other research directly examining the impact of vision training on sports performance has similarly found little evidence of its effectiveness. For example, studies by Harris et al. (2018) and Vater et al. (2021) have not demonstrated significant benefits of vision training in enhancing sports performance. These findings provide further debate concerning the efficacy of vision training and / or NeuroVisual Training in this context.

Laby and Applebaum published a review in 2021 concerning sports performance enhancement and vision training [11]. They concluded, “Based on this review, it is concluded that, despite promising evidence supporting the role of vision in sports performance and improvements due to training, the specialty is still in need of methodological improvements. It is recommended that studies aim for larger better-powered studies, consistent and precise outcome measures, and greater scientific rigor such as obtained through randomized placebo-controlled designs with pre-registration of hypotheses.” In other words, the data are promising, but more research needs to be done. But that there is promise moving forward. They are opening the door to help us better serve our athletes. There is even a scoping review of many of the vision-based performance enhancement studies [12]. This is a tremendous resource containing a lot of references concerning training and performance enhancement.

Others have published that NVT improves batting average. Two separate studies done at separate institutions by different researchers both published that NVT improved batting performance in college baseball players [2, 6.] Interestingly neither study was referenced in a recent paper by Fransen [7, 10]. We strongly suggest that these two studies be considered as relevant because the results of each study corroborate the results and conclusions of the other. The studies used different, but complimentary, NVT methods as the intervention. Both used batting performance as a distal endpoint. Both studies showed proximal and distal benefits. In the scientific literature it is very common for ‘more research’ to be performed to demonstrate a phenomenon. Rarely will two very concordant studies show very similar results, but herein we see just such results, with continued supporting evidence [6].

Further controversy builds in the NVT and performance benefits debate with a recent article that reviewed a very limited number of papers and concluded there was no benefit to NVT and performance enhancement. Fransen claimed that the proximal benefits from NVT did not translate to distal benefits. Or, in other words, NVT did not improve performance in any of the papers reviewed by the author [7]. The choice of articles reviewed was unclear and not inclusive of a lot of NVT practitioners nor multiple sports. Nor did the author reference the volume of data from the US Airforce academy who do NVT for pilots and their documented performance enhancement [1].

The US Air Force Academy has been implementing Vision and Brain training for their cadets and athletes since the 1990s. Led by Zupan and Wile [1, 5, 9], this initiative has reported enhanced performance among cadets, with findings such as, “The individual who can process more visual information in a shorter period and make the proper response will have an advantage in competition.” Additionally, higher retention and pass rates among pilots who received this training have been observed. It is important to note that the primary objective of these cadets is not to excel in competitive sports but to prepare for combat, where improved performance can be crucial for preserving life.

Fransen adds a broader perspective, noting that “many technology companies and researchers continue to invest in training tools, methods, and technologies that claim to facilitate far transfer. Many sport scientists contribute to the field by developing rigorous studies that test some of the most prominent, yet unsubstantiated claims made in the sports skill learning realm.” This raises questions about whether the claims made by the US Air Force Academy regarding vision and brain training are fully substantiated. Is there a suggestion that Air Force cadets might be misled?

Fransen’s article title presents a firm stance in the title: “There is no supporting evidence of a far transfer of general perceptual or cognitive training to sports performance.” The title leaves little room for ambiguity. While many researchers typically conclude that further research is needed, Fransen states there is “no supporting evidence.” However, a review of the literature reveals multiple groups of researchers and practitioners publishing findings and acting in ways that suggest a different perspective, including a pre-registered systematic review of 118 articles that report on vision training in athletes. Please note that this article has a reference list that supports NeuroVisual Training and sports performance enhancement [13].

We in the Friends of NeuroVisual Training Newsletter community, thoroughly embrace controversy and invite more research. However, the apparent summary dismissal suggested by Fransen’s title, which overlooks decades of research, does not foster a culture of investigation aimed at benefiting the human condition. In conclusion, there is growing interest and controversy concerning NeuroVisual Training (NVT) and sports performance enhancement. We need more open-minded clinicians and researchers to test and report on the possible benefits of brain training for athletic performance.

References:

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How To: Speed of Accommodation and Processing

In the fast-paced world of sports, the ability to quickly process visual information and act upon it in dynamic situations is an essential skill for peak performance. The Hercules System, Inneuractive's latest training platform, contains a program designed to enhance athletes' speed of accommodation (ability of the eyes to adjust focus quickly), split attention on two locations, and processing (ability to process what is seen at various depths) abilities in sport-specific manners.

The Hercules System is an innovative platform that allows for sport-specific customization that targets the unique demands of each discipline. Whether it's a quarterback reading the defense, a soccer player scanning the field, or a hockey player looking from the puck to a target, our system tailors the training experience to enhance the precise visual and cognitive skills required for success. In this article we'll explore a few different training options for very specific sports situations.

The Hercules System's first program, speed of accommodation, was initially designed for improving batting averages but throughout development it began to take on a whole new shape and functionality. Fulfilling user needs across many ball sports, athletic disciplines, and for the public regarding driving, learning, and more.

What Comes with Hercules?

Each Hercules System comes with 100ft of HDMI cords, an Xbox controller, two portable display units that can also be used as projectors, and a computing system for controlling Hercules. This allows for unique set ups that can mirror plays, in-game situations, or general training opportunities to refine accommodating and processing skills.

Scenario One: Training a Soccer Midfielder

Picture a midfielder on the pitch, constantly glancing over their shoulder to check the field's layout as the ball approaches. With the Hercules System, you can now simulate this crucial skill.

The athlete stands between two screens, feeling the tension of the game as symbols flash at random. Their head snaps back and forth, their focus sharp as they identify each symbol, translating it into a split-decision via the game controller. This drill mirrors the demands of a real match, honing the player's ability to process visual information swiftly, helping them anticipate and make faster decisions.

Scenario 2: Hockey Near/Far

On the ice, every second counts. The Hercules System helps hockey players master the art of quick transitions in focus – from puck to goal or from puck to passing target. Imagine setting up one of the display units that projects onto the ground. This simulates the puck at the stick of the player. The other unit projects to a wall, simulating a passing outlet or goal. The athlete, in their hockey stance, practices shifting focus between the near and far screens, sharpening the split-second decisions that can mean the difference between taking a hit or avoiding a hit, making a pass or missing the opportunity.

In conclusion the SOAP program on the Hercules System is a novel and quantitative way to test and train reaction times, speed of processing and split attention. Most clients find it fun and engaging as well as have a high degree of interest in tracking their performance and improving their performance. If you want more information about the Hercules System, to see it in action or enquire about how to get one please contact info@inneuractive.com

Stay tuned for the next addition to the Hercules System: SmartCharts, featuring customizable digital Hart Charts and Stroop Charts. Coming soon!

Disclaimer: Nothing in this communication should be construed as a practice of medicine, an endorsement, or political action. The opinions are the opinions of the authors.

Announcements

The Friends of NVT newsletter editorial board welcomes Sanjana Kethiri as our newest board member. Welcome Sanjana.

This is the last issue of Volume 11 of the newsletter. Volume 12 will be launched on or about Sept 19th 2024.

If you are finding that every other week for an NVT infusion is not frequent enough, please keep an eye out for our latest post series called, Brain Rae's. Brain Rae's will come out twice a week with focused (150 words) postes on an NVT topic. It will be available on our Twitter (X) @FriendsofNVT.

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.

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