

## Neuro-Doping, tDCs and Chess - Are WADA's Regulations under threat?

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### ABSTRACT

*The recent emergence of cognitive enhancement techniques, including non-invasive brain stimulation (NIBS), has reignited discussions on the serious concerns regarding the World Anti-Doping Agency's (WADA) outdated anti-doping regulations. Hitherto, much has been written from the perspective of drugs, physical enhancements and physical sports, but little has been analysed through the lens of NIBS/cognitive enhancement/mind sports. Using the example of transcranial direct current stimulation (tDCS), a form of NIBS, in professional chess as a case study, this article contends that WADA's anti-doping regulations are, paradoxically, both under- and over-exclusive in part as a result of physical sports scandals in the 1980s. This article comprises three Sections. The first Section identifies four key problematic areas of WADA's anti-doping regulations, including the failures of WADA's 'two-thirds rule' as well as the failure to distinguish between physical and mind sports, before engaging with the application of tDCS in chess in order to illustrate the existence of deep-rooted defects within WADA's framework. Section II argues that WADA's deontological approach is unjust in the context of cognitive enhancement, before proceeding to deconstruct and question the validity of the key underlying ethical principles that shape WADA's policy. Finally, Section III offers a vision of a decentralised regime which gives priority to the health of the athlete, pays regard to actual enhancements and appreciates the nuances of individual sports. Such a regime would create a more robust and equitable regulatory system.*

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**ABBREVIATIONS**

CAS	Court of Arbitration for Sport
EEG	Electroencephalography
EPO	Electroencephalogram
FIDE	World Chess Federation ( <i>Fédération Internationale des Échecs</i> )
FINA	World Swimming Federation ( <i>Fédération Internationale de Natation</i> )
FIVB	International Volleyball Federation ( <i>Fédération Internationale de Volleyball</i> )
IPC	International Paralympic Committee
IOC	International Olympic Committee
LTM	Long-term memory
NCAA	National Collegiate Athletic Association
MDD	Major depression disorder
NADOs	National anti-doping organisations
NIBS	Non-invasive brain stimulation
PLIS	Prohibited List International Standard (effective as of 1 January 2022)
tACS	Transcranial alternating current stimulation
tDCS	Transcranial direct current stimulation
tRNS	Transcranial random noise stimulation

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tMS	Transcranial magnetic stimulation
WADA	World Anti-Doping Agency
WADC	WADA's Anti-Doping Code 2021
World Athletics	International Amateur Athletics Federation (formerly known as International Amateur Athletic Federation)

## INTRODUCTION

The etymological origins of ‘sport’<sup>1</sup> come from the old English word ‘disport’, meaning a ‘diversion from serious duties; relaxation, recreation, entertainment, amusement’.<sup>2</sup> Over the centuries, however, the concept of sport has evolved into a much more serious endeavour. The Olympic motto ‘*Citius, Altius, Fortius — Communitus*’ or ‘faster, higher, stronger — together’ embodies the notion of competition, the use of comparatives indicative of a notion of superiority over one’s competitors, that is, a competition *for victory*. At the same time, athletes must play by the rules: they must not achieve victory by any means possible and they must not, in any way, seek to unfairly gain advantage over other athletes. In other words, they must not *cheat*. It is against this background that ‘doping’ — the act of taking illicit substances/methods for the purpose of performance enhancement — is subject to intense regulation by WADA, a foundation set up in 1999 under the initiative of IOC with more than 650 signatories to WADC, its anti-doping Code, which include international sports federations, NADOs and IPC<sup>3</sup>. What emerges is a tension between the pressures of victory — exacerbated by contemporary realities of funding pressures, national pride and sponsorships — and a duty to uphold the fundamental rationale of WADC — the ‘spirit of sport’.

### *Scope and Structure of this Article*

This article seeks to explore the multiple fundamental deficiencies that plague WADA’s approach to doping. These deficiencies include, in particular, issues associated with an outdated concept of the ‘spirit of sport’ for anti-doping regulations and a *duty*-based regulatory framework that punishes the *intention* to gain an unfair advantage, as opposed to the *outcome* of actually gaining an unfair advantage. Concerningly, such an intention can be further stretched to capture circumstances where the required state of mind does not even exist, as

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<sup>1</sup> ‘Sport, *n.1*: Oxford English Dictionary’ (OED.com, 2022)

<<https://www.oed.com/viewdictionaryentry/Entry/187476>> accessed 26 April 2022.

<sup>2</sup> *ibid.*

<sup>3</sup> WADA, “Code Signatories” (World Anti-Doping Agency November 8, 2022)

<<https://www.wada-ama.org/en/what-we-do/world-anti-doping-code/code-signatories>> accessed November 26, 2022.

this article will illustrate in Section 1.1. These deficiencies are exacerbated by the recent emergence of NIBS techniques such as tDCS, which pose new issues, especially in the context of cognitive enhancement. The emergence of NIBS techniques has sparked debate over their future regulation and (re)ignited past discussions concerning the adequacy of WADA's criteria which currently regulate *some* forms of cognitive enhancement, but not all. Debates on NIBS add a new dimension to the existing chorus of dissatisfaction with WADA's regime by bringing to the fore the problem of its 'all-inclusive' approach. Such an approach embraces indiscriminate application of doping regulations to *all* sports, regardless of the nuances of each individual sport, backed by the omnipotent spirit of sport as a philosophy and a regulatory criterion. The time is indeed ripe for WADA to seriously reflect on its increasingly untenable position both with regards to upholding its current anti-doping regulations as well as to its own existence as a governing body. Additionally, since the issue of doping has far-reaching implications for professional athletes and other stakeholders, a more considered approach by WADA could help orient economic and political discussions that will ultimately help shape important policy decisions.

This article will be divided into three sections. Section I, Part A provides context by identifying four key problematic areas of WADA's anti-doping regulations contained in WADC. WADC is a lengthy document with a broad coverage ranging from testing to hearings. This article specifically focuses on the compilation of PLIS pursuant to Article 4 of WADC. Section I, Part B will analyse whether new NIBS technologies can, using tDCS and chess as examples, be banned under the current WADA framework. Section II will then deconstruct WADA's anti-doping regulations in light of those findings. Finally, Section III will conclude by offering alternative pathways going forward, which include placing the athlete's health at the centre of future regulations.

### *Justifying the Scope*

Before examining WADA's regulations, it is pertinent to first explain why tDCS and chess are used as analytical tools.

#### *a) Definitions*

tDCS is a form of non-invasive neurostimulation that involves 'the placement of electrodes on the human scalp for the purpose of stimulating

specific brain functions'.<sup>4</sup> Low current is briefly transmitted through the skull to alter 'cortical excitability and activity dependent on the current flow direction through the target neurons'.<sup>5</sup> There is a growing body of literature that suggests that tDCS is 'safe and effective when used for therapeutic purposes'.<sup>6</sup>

Before examining further *why* tDCS was selected, it is pertinent to clarify the definitions of key terms, specifically, 'cognition', 'cognitive enhancement', 'NIBS' and 'neuro-doping'. Cognition relates to the organisation, acquisition, selection, representation and retention of information, and cognitive enhancement may be directed at improving any one of these core faculties.<sup>7</sup> According to Sandberg, a huge range of such enhancement methods exists<sup>8</sup> from relatively non-controversial educational techniques aimed at improving efficiency (such as mnemonics, encoding strategy and speed reading) and approaches aimed at improving health generally (through sleep, immune, exercise or improved nutrition)<sup>9</sup> to more controversial techniques, such as drug stimulants (e.g., caffeine and nicotine) and genetic modifications.

Neuro-doping, on the other hand, refers to 'direct interventions into the brain'<sup>10</sup> and typically takes the form of electrical stimuli being fired into specific areas of the brain — 'as opposed to other parts of the body'<sup>11</sup> — to stimulate a reaction, whether it is increased reaction time or memory retention and recall. Such technology has hitherto been used in a clinical setting, such as through tMS, to treat, for example, MDD.<sup>12</sup> Two essential points must be highlighted at the outset. First, neuro-doping differs from cognitive

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<sup>4</sup> Colton D Smith, 'The Electric Brain: Do-It-Yourself Healthcare With Transcranial Direct Current Stimulation' (2017) 5 *Journal of Responsible Innovation* 88.

<sup>5</sup> AJ Woods and others, 'A technical guide to tDCS, and related non-invasive brain stimulation tools' (2016) 127 *Clinical Neurophysiology* 1031.

<sup>6</sup> Smith (n 4) 89.

<sup>7</sup> Nick Bostrom and Anders Sandberg, 'Cognitive Enhancement: Methods, Ethics, Regulatory Challenges' (2009) 15 *Science and Engineering Ethics* 312.

<sup>8</sup> *ibid.*

<sup>9</sup> Ulric Neisser, 'Rising Scores on Intelligence Tests' (1997) 85 *American Scientist* 440; Phillip D Tomporowski, 'Effects of acute bouts of exercise on cognition' (2003) 112 *Acta Psychologica* 297.

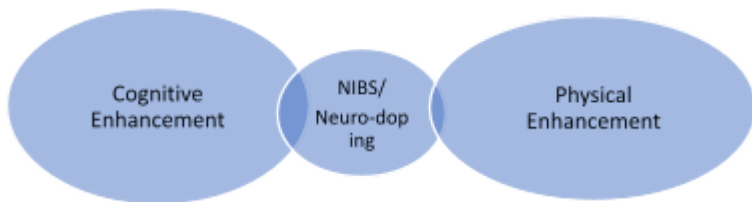
<sup>10</sup> Alexandre Erler, 'Neuro-Doping and the Value of Effort in Endurance Sports' (2020) 14(2) *Neuroethics* 1.

<sup>11</sup> *ibid.*

<sup>12</sup> SL Garnaat and others, 'Updates on Transcranial Magnetic Stimulation Therapy for Major Depressive Disorder' (2018) 41 *Psychiatric Clinics of North America* 419.

enhancement in one key aspect: the term ‘doping’ incorporated in ‘neuro-doping’ implies that the use of such an enhancement is necessarily an ‘unauthorised means to increase performance in sport’.<sup>13</sup> The current emerging cognitive-enhancing technologies, such as tDCS, tRNS, tACS and EEG, do not fall within the ambit of WADC (as yet) and it would accordingly be a misnomer to refer to these methods as ‘neuro-doping’. Indeed, it is the intention of this article to establish whether such methods should be regarded as ‘neuro-doping’ and thus regulated by WADA.

Secondly, there is ‘no sharp line between n[euro]-d[oping] and non-n[euro]-d[oping]’<sup>14</sup> since traditional doping (e.g., through the use of anabolic steroids) can affect mental capacities and the use of neuro-doping can also affect physical ‘endurance and muscle strength’.<sup>15</sup> Given the overlap, it is only a matter of degree to what extent neuro-doping can enhance cognition and/or physical capacities for a given sport, though methods directed at cognitive improvement are more likely to result in cognitive rather than physical enhancement. This point is particularly relevant to one of the assertions on the physical/mental divide discussed in Section 2.1. The correlation between cognitive enhancement, NIBS/neuro-doping and physical enhancement can be best depicted in the Venn diagram as follows.



**Figure 1: Venn diagram showing the correlation between neuro-doping and cognitive and physical enhancement, respectively**

<sup>13</sup> Nick J Davis, ‘Neurodoping: brain stimulation as a performance-enhancing measure’ (2013) 43 *Sports Medicine* 649.

<sup>14</sup> TS Petersen and K Lippert-Rasmussen, ‘Neuro-Doping and Fairness’ (2020) 14 *Neuroethics* 1179.

<sup>15</sup> *ibid.*

*b) Why tDCS*

The reasons for the choice of tDCS are threefold. First, tDCS, as an emerging technology, has already shown its potential to impact both physical and cognitive performance. In terms of enhancement in physical sports, studies have shown that tDCS can help with accuracy in pistol shooting,<sup>16</sup> basketball<sup>17</sup> and golf putting,<sup>18</sup> as well as enhance muscular force generation for sports requiring vertical jumping ability.<sup>19</sup> Regarding cognitive enhancement, studies have suggested that tDCS can help with memory,<sup>20</sup> numerical magnitude processing,<sup>21</sup> complex verbal problem-solving<sup>22</sup> and three-dimensional mental rotation performance.<sup>23</sup> Davis argues that neuro-doping will become 'a key technology for the future of sport and sports medicine',<sup>24</sup> whilst Zhu Z et al. are of the view that 'tDCS has strong potential to enhance athletic performance'.<sup>25</sup>

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<sup>16</sup> AM Kamali and others, 'Transcranial Direct Current Stimulation to Assist Experienced Pistol Shooters in Gaining Even-Better Performance Scores' (2019) 18 *Cerebellum* 119.

<sup>17</sup> MA Friehs and others, 'Electrify Your Game! Anodal tDCS Increases the Resistance to Head Fakes in Basketball' (2019) 4 *Journal of Cognitive Enhancement* 62.

<sup>18</sup> FF Zhu and others, 'Cathodal Transcranial Direct Current Stimulation over Left Dorsolateral Prefrontal Cortex Area Promotes Implicit Motor Learning in a Golf Putting Task' (2015) 8 *Brain Stimulation* 784.

<sup>19</sup> E Lattari and others, 'Can Transcranial Direct Current Stimulation Improve Muscle Power in Individuals with Advanced Weight-Training Experience?' (2020) 34 *Journal of Strength and Conditioning Research* 97.

<sup>20</sup> NR Polizzotto, N Ramakrishnan, and RY Cho, 'Is It Possible to Improve Working Memory With Prefrontal Tdcs? Bridging Currents to Working Memory Models' (2020) 11 *Frontiers in Psychology* 1.

<sup>21</sup> TU Hauser and others, 'Enhancing Performance in Numerical Magnitude Processing and Mental Arithmetic Using Transcranial Direct Current Stimulation (tDCS)' (2013) 7 *Frontiers in Human Neuroscience* 1.

<sup>22</sup> C Cerruti and G Schlaug, 'Anodal Transcranial Direct Current Stimulation of the Prefrontal Cortex Enhances Complex Verbal Associative Thought' (2009) 21 *Journal of Cognitive Neuroscience* 1980.

<sup>23</sup> R Zhu, Z Wang, and X You, 'Anodal Transcranial Direct Current Stimulation Over the Posterior Parietal Cortex Enhances Three-Dimensional Mental Rotation Ability' (2021) 170 *Neuroscience Research* 208.

<sup>24</sup> Davis (n 13) 649.

<sup>25</sup> Z Zhu and others, 'Commentary: "Brain-Doping," Is It a Real Threat?' (2019) 10 *Frontiers in Physiology Article* 1489.



Secondly, tDCS as a technique is already being distributed and used commercially, with companies like Halo Neuroscience showcasing professional tDCS devices and with evidence of tDCS use by Olympic athletes<sup>26</sup> and professional sports teams.<sup>27</sup> Along with increased accessibility and availability comes the concern of reporting bias. For example, Halo Neuroscience has been marketing the results of its own commissioned studies regarding tDCS.<sup>28</sup> Even though these studies fail to offer a holistic or accurate picture of the technology, it is entirely conceivable that athletes seeking a competitive advantage will nonetheless be lured by such aggressive advertising strategies and by what tDCS purportedly offers.<sup>29</sup> Given these campaigns, athletes may come to associate tDCS devices psychologically with safety, simplicity and affordability. It is therefore incumbent on WADA, as the coordinator of anti-doping efforts, to address without delay the many issues plaguing WADC which hinder proper and effective development of anti-doping regulations amidst the mounting concerns of tDCS usage in the sports world.

Thirdly, debates on tDCS can offer significant contributions to pre-existing literature on the acceptability of and issues with doping. Although ethical debates on cognitive enhancement in general are abundant, these have so

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<sup>26</sup> 'US Athletes Using Brain Stimulation to Improve Olympic Performance' (RT International, 2022) <<https://www.rt.com/sport/354921-us-athletes-using-brain-stimulation/>> accessed 26 April 2022.

<sup>27</sup> Alex Hutchinson, 'For the Golden State Warriors, Brain Zapping Could Provide an Edge' (*The New Yorker*, 25 June 2016) <<http://www.newyorker.com/tech/elements/for-the-golden-state-warriors-brain-zapping-g-could-provide-an-edge>> accessed 20 April 2022.

<sup>28</sup> See, for example: Halo Neuroscience, 'Bihemispheric Transcranial Direct Current Stimulation with Halo Neurostimulation System Over Primary Motor Cortex Enhances Fine Motor Skills Learning in a Complex Hand Configuration Task' (2016); Halo Neuroscience, 'Bihemispheric Transcranial Direct Current Stimulation with Halo Neurostimulation System Over Primary Motor Cortex Enhances Rate of Force Development in an Isometric Lateral Pinch Force Task' (2016); Halo Neuroscience, 'Safety of Non-Invasive Brain Stimulation Delivered via the Halo Neurostimulation System in Healthy Human Subject' (2016).

<sup>29</sup> On inaccuracy, see, for example, on decrease in working memory and tDCS headsets: L. Steenbergen and others, "'Unfocus" on *foe.us*: commercial tDCS headset impairs working memory' (2015) 234 *Experimental Brain Research* 637. On lures of interventions, see B Goldman and R Klatz, *Death in the Locker Room* (Elite Sports Medicine Publications 1992).

far been mainly focused on its use in academia<sup>30</sup> or by military personnel,<sup>31</sup> leading to Petersen's claim that the 'ethical analysis on the use or possible use of neuro-doping in sport is a neglected subject'.<sup>32</sup> This vacuum is undesirable and, from a public policy perspective, how WADA chooses to regulate (or not to regulate) may send (unintentional) messages to aspiring athletes as to the nature of doping and the extent to which enhancement is acceptable. This article is motivated by the conviction that if debate on the regulation of tDCS in sports is delayed, regulation risks becoming merely reactionary to scandals. As Ritchie and Jackson have pointed out, 'instead of rational, proactive, and ethically based decision-making, "suits and administrators" reacting to politically charged events and shocks have pervaded the history of anti-doping policies'.<sup>33</sup> For example, the national consternation and embarrassment of Ben Johnson's stripped Olympic gold medal<sup>34</sup> directly led to the creation of the Canadian Centre for Ethics in Sport and their spirit of sport campaign.<sup>35</sup> This subsequently morphed into the very basis of WADA's entire regulatory framework. The issue with such regulation, however, is that it is influenced by the shock and emotional impact of scandals and not, as Ritchie and Jackson suggest, a balanced and 'ethical' decision-making process.<sup>36</sup> Therefore, the earlier the discourse, the better the regulation, and the more thorough and considered the resultant regime.

*c) Why chess*

The reasons for selecting chess as a case study for the effects of tDCS are fourfold. First, significant headway has been made in the cooperation between the governing body of chess FIDE and WADA. Being a signatory to

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<sup>30</sup> Scott Vrecko, 'Just How Cognitive Is "Cognitive Enhancement"? On the Significance of Emotions in University Students' Experiences with Study Drugs' (2013) 4 *AJOB Neuroscience* 4-12.

<sup>31</sup> TT Brunyé and others, 'A Review of US Army Research Contributing to Cognitive Enhancement in Military Contexts' (2020) 4 *Journal of Cognitive Enhancement* 453.

<sup>32</sup> Thomas Søbirk Petersen, 'Sport, Neuro-Doping and Ethics' (2021) 14 *Neuroethics* 1.

<sup>33</sup> I Ritchie and G Jackson, 'Politics and "shock": reactionary anti-doping policy objectives in Canadian and international sport' (2014), 6 *International Journal of Sport Policy and Politics* 195.

<sup>34</sup> 'Johnson Stripped of Gold' (*BBC Sport*, 27 September 2013)

<<https://www.bbc.com/sport/av/athletics/24276046>> accessed 26 April 2022.

<sup>35</sup> Ritchie and Jackson (n33)

<sup>36</sup> *ibid.*

WADC, FIDE has adopted WADA's anti-doping policy in full and, in 2015, published a comprehensive anti-doping code based on WADC and WADA's Models of Best Practice.<sup>37</sup> Amongst the various duties, FIDE must, under Article 18 of the FIDE anti-doping rules, periodically report to WADA on the compliance of FIDE's anti-doping policy with WADC. As such, any changes to WADA's policy will have subsequent knock-on effects on the regulation of doping in chess.

Secondly, chess is a uniquely suited sport for discussing cognitive enhancements since performance is comparatively easy to quantitatively assess. The universal system of performance rating in chess — the FIDE rating — allows the strength of players to be measured by reference to a predetermined algorithm that reflects performance in tournaments. Although this standardised unit of measurement does not directly illustrate *actual* cognitive performance, it is nonetheless a valuable tool that allows comparisons of skill levels to be drawn between players and with respect to the player themselves. Furthermore, since chess is a game with a finite number of moves, the quality of each move can be objectively assessed against how external factors, such as fatigue, might impact performance. Finally, with chess being a game with mathematical foundations comprising of patterns, aspects like opening theories and endgame strategies can be linked to certain areas of cognitive abilities, which lend themselves well to controlled research, such as detection of memory recall and pattern recognition. These features, especially measurability, are valuable attributes not necessarily present in all mind sports, such as Esports (which will be discussed later).

Thirdly, and relatedly, a study on the effects of psychopharmacological drugs on chess performance conducted in 2017<sup>38</sup> concluded that Ritalin and Modafinil can enhance chess performance by some 13–15%.<sup>39</sup> Although no equivalent research directly on the effects of tDCS on chess has been

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<sup>37</sup> FIDE Handbook

<<https://handbook.fide.com/files/handbook/FIDEAntiDopingRules.pdf>> accessed 26 April 2022.

<sup>38</sup> AG Franke and others, 'Methylphenidate, modafinil, and caffeine for cognitive enhancement in chess: A double-blind, randomised controlled trial' (2017) 27 *European Neuropsychopharmacology* 248.

<sup>39</sup> Dylan Loeb McClain, 'Proven: performance-enhancing drugs for chess' (*ChessBase*, 25 January 2017)

<<https://en.chessbase.com/post/proven-performance-enhancing-drugs-for-chess>> accessed 28 September 2022.

conducted, this study suggests that chess performance could be capable of enhancement via external aid. In turn, it is possible to posit that similar conclusions might be drawn if tDCS is used. Studies have already shown that tDCS has potential to enhance qualities including information processing,<sup>40</sup> attention,<sup>41</sup> alertness<sup>42</sup> and memory<sup>43</sup> — four cognitive aspects which are particularly relevant to chess performance. Chess is therefore uniquely placed in any study on the potential applicability of tDCS.

Finally, the nature of chess as a mind sport raises unique questions as to our understanding of the spirit of sport. This concept, which has already been criticised for being excessively vague (which the analysis below will substantiate),<sup>44</sup> faces even more problems when applied in the context of chess. The spirit of sport criterion was created largely as a reactionary response to the controversies in *physical* sports, which means that it does not capture the differing values underpinning mind sports. Indeed, the values inherent to mind sports such as chess differ greatly from those of, for example, sprinting — an admittedly fine distinction to be explored in more detail in Section 1.3. Moreover, the spirit of sport criterion fails to appreciate the nuanced distinctions present between sports, even in the same category; for example, while reaction times are crucial to performance in Esports, good chess play is often equated with slow and measured calculations to avoid blunders.

With FIDE's commitment to anti-doping, the standardised measurement of chess performance, empirical data on tDCS studies, as well as the questions it raises about the spirit of sport, mean that chess lends itself very

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<sup>40</sup> R Abedanzadeh, S Alboheish, and P Barati, 'The effect of transcranial direct current stimulation of dorsolateral prefrontal cortex on performing a sequential dual task: a randomized experimental study' (2021) 34 *Psicologia: Reflexão e Crítica*.

<sup>41</sup> C Cosmo and others, 'A Randomized, Double-Blind, Sham-Controlled Trial of Transcranial Direct Current Stimulation in Attention-Deficit/Hyperactivity Disorder' (2015) 10 *PLoS One* 1.

<sup>42</sup> LK McIntire and others, 'Transcranial direct current stimulation versus caffeine as a fatigue countermeasure' (2017) 10 *Brain Stimulation* 1070.

<sup>43</sup> L Huo and others, 'Transcranial Direct Current Stimulation Enhances Episodic Memory in Healthy Older Adults by Modulating Retrieval-Specific Activation' (2020) 2020 *Neural Plasticity* 1.

<sup>44</sup> See, for example, I Waddington and others, 'Recreational drug use and sport: Time for a WADA rethink?' (2013) 2 *Performance Enhancement and Health* 41.

well as an appropriate sport through which to consider the regulation of neuro-interventions.

## I. SECTION I: WADA's REGULATIONS

### Part A: Four Key Concerns

This Section will discuss four key themes with respect to WADA's current anti-doping regulations: two of these relate to the criteria for prohibiting a substance/method, and the other two relate to WADA's failure to observe various crucial distinctions. These four key concerns are by no means compartmentalised: issues relevant to one may be relevant to another and may even conflate.

Doping is defined in WADC as 'circumstances and conduct'<sup>45</sup> that violate the code (Article 1 of WADC). These range from the 'presence of *prohibited substances* in athletes' samples' (Article 2.1) to 'attempts on evading, refusing or failing to submit doping samples' (Article 2.3). Debate has hitherto been focused on the former and, as per Article 4.3, the inclusion of a substance on the prohibited list (PLIS) requires fulfilment of two of the three criteria (i.e., 4.3.1.1-4.3.1.3 of WADC), hereafter referred to as the 'two-thirds criteria'. This article is focused on criticising the two-thirds criteria set out in Article 4.3, which states that WADA shall consider the following when deciding if a substance or method ought to be included in PLIS:

- 4.3.1.1 'Medical or other scientific evidence, pharmacological effect or experience that the substance or method, alone or in combination with other substances or methods, has the *potential* to enhance or enhances sport performance; (*Enhancement Criterion*)
- 4.3.1.2 Medical or other scientific evidence, pharmacological effect or experience that the use of the substance or method

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<sup>45</sup> WADC

<[https://www.wada-ama.org/sites/default/files/resources/files/2021\\_wada\\_code.pdf](https://www.wada-ama.org/sites/default/files/resources/files/2021_wada_code.pdf) >  
accessed 29 April 2022

represents an actual or *potential* health risk to the athlete; (*Health Criterion*)

- 4.3.1.3 WADA's determination that the use of the substance or method violates the spirit of sport described in the introduction to the Code.<sup>7</sup> (*Spirit of Sport Criterion*)

Of the three, the inclusion of the health criterion has been the least controversial. By any measure, the health of athletes should be at the core of any regulatory stance, and should as far as possible be protected — a point more fully explored in the final Section. What is more contentious, however, is the enhancement and the spirit of sport criteria. These will be discussed below, though it is worth highlighting here that the spirit of sport is *more than* just a criterion. The spirit of sport has been expressed as a fundamental rationale for anti-doping ('spirit of sport clause') enshrined in the preamble of WADC. This term and the many perspectives it purportedly represents are expanded upon in Section 1.2. Of relevance and worth stating for now is that lively debates have emerged over the years on this criterion's very meaning, with the supporters of the concept arguing that the spirit of sport clause never purported to be an absolute definition and that it is merely a characterisation of sport.<sup>46</sup> Notwithstanding its many criticisms, the spirit of sport remains, to date, the pillar or 'cornerstone justification'<sup>47</sup> for anti-doping, having survived several revisions of WADC since its first publication in 2003.

## 1.1 Enhancement Criterion

Strikingly, enhancement is *not* compulsory for the banning of an intervention as it is only one of the three criteria (alternatively, a substance could be banned if it (a) represents an actual or potential risk to the athlete's health and (b) its use is considered contrary to the spirit of sport), nor is *actual* enhancement required to be shown if this criterion were invoked. Thus, the optional applicability of the enhancement criterion implies that a substance can

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<sup>46</sup> Michael McNamee, 'The Spirit of Sport and The Medicalisation of Anti-Doping: Empirical and Normative Ethics' (2012) 4(4) *Asian Bioethics Review* <<https://muse.jhu.edu/article/494969>> accessed 29 April 2022.

<sup>47</sup> Mojsola and Pascal Borry, 'The Landscape of the "Spirit of Sport"' (2019) 16 *Journal of Bioethical Inquiry* 444.

be included on PLIS even if it does not enhance or if it in fact *diminishes* performance. Cannabinoids, for example, are banned despite evidence suggesting that they diminish athletic performance.<sup>48</sup> This seems to be a somewhat nonsensical phenomenon — surely, substance intake in the absence of enhancement runs counter to our understanding of what doping is. If the purpose of WADC is to prevent illicit enhancement, or ‘cheating’ through gaining an unfair advantage, the enhancement criterion should be compulsory rather than optional.

Not only is it problematic that the applicability of the enhancement criterion is not compulsory, the formulation of the criterion itself is paradoxically and unduly inclusive. Upon analysing the wording of the criterion, subsections 4.3.1.1 and 4.3.1.2 provide that a substance or method may be prohibited if it has a mere ‘*potential*’ to enhance. This means that a substance or technique *does not* have to be proven to enhance but merely that it has potential to do so. Applying this formulation, potential health risks could include ‘eating three plates of spaghetti’ risking obesity, whilst potential to enhance could include ‘six training sessions per week at the age of ten (a method currently employed in numerous sports)’.<sup>49</sup> In this manner, WADA has taken a strict, deontological approach which focuses on punishing athletes’ *attempts* at gaining an unfair advantage, regardless of whether that unfair advantage is in fact gained. By favouring deontological arguments, the regulation of doping results in a duty-based regulatory framework in which athletes are strictly punished for the breach of their duties. By focusing on punishing the very *act* of doping, regardless of the athlete’s *actual* intention or resulting enhancement (if any), the parameters for WADA’s exercise of discretion have been set incredibly wide, whereby the power to ban an intervention is triggered by the slightest degree of health risk or enhancement potential. It follows that, although the enhancement criterion should be a purely factual matter underpinned by relevant biomedical evidence,<sup>50</sup> it can (and too often does) become a subjective judgement call made

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<sup>48</sup> Marilyn A Huestis, Irene Mazzoni and Olivier Rabin, ‘Cannabis in Sport: anti-doping perspective’ (2011) 41 *Sports Medicine* 949.

<sup>49</sup> Olivier de Hon, ‘The Redundancy of the Concept Of ‘Spirit of Sport’ in Discussions on The Prohibited List Of Doping Substances’ (2017) 9 *International Journal of Sport Policy and Politics* 671.

<sup>50</sup> Sigmund Loland and Hans Hoppeler, ‘Justifying anti-doping: The fair opportunity principle and the biology of performance enhancement’ (2012) 12(4) *European Journal of Sport Science* 347.

under no known indicative test by WADA.<sup>51</sup> Even if there are such tests, the reasoning behind their application would not be documented nor available for inspection, and often ‘the minutes of the meetings where [such] decisions [are] made’ are not recorded.<sup>52</sup> At times, ‘implicit criteria’<sup>53</sup> appear to be at work when the contents of PLIS are discussed. Two such examples cited in the literature are the considerations associated with the need to protect athletes themselves from harm, and the preservation of their image as role models to young admirers.<sup>54</sup>

A further way in which the enhancement criterion is excessively expansive is that it captures substances that are not by themselves enhancing but may be such if combined with other substances, as per footnote 27 of WADC: ‘there may be substances that, when used alone, are not prohibited but which will be prohibited if used in combination with certain other substances’. This clarification seeks to encompass a wider set of potential substances and, without further guidance, generates (at least theoretically) an endless list of substances/methods capable of falling within the ban on account of *possible* interactions. As an extreme example, imagine an instance where there is an intake of water along with protein, which then produces an enhancing effect — it would seem to appear that, under the current framework, water and protein can indeed be theoretically banned under the enhancement criteria if and when combined. If so, this may surely have the effect of capturing ‘ordinary’ substances which an athlete would consider using as standard practice. It would then be left to the ambiguous notion of the spirit of sport (as the other criterion is required to reach the two-thirds threshold for banning) which, in theory, might narrow down the list of potential banned substances/methods. In practice, using the notion of the spirit of sport to qualify for the application has its own deep conceptual flaws that hinder its ability to provide a fair and logical solution. This will be discussed in detail in Section 1.2. Evidently, the example given here is hypothetical, but it seeks to show that the above-mentioned criticisms are not simply semantic: they go to the fundamental contention that these criteria are of little practical guidance.

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<sup>51</sup> Jonathan Pugh and Christopher Pugh, ‘Neurostimulation, doping, and the spirit of sport’ (2021) 14(2) *Neuroethics* 141.

<sup>52</sup> de Hon (n 49) 671.

<sup>53</sup> *ibid* 671.

<sup>54</sup> *ibid* 672.



This expansive approach is not only indicative of WADA's lack of clear guidance on enhancement but can be perceived as an intentional ambiguity on WADA's part to fulfil its desire for flexibility, which is in line with its pre-emptive approach to *police* the duty not to dope, and its quest 'to get rid of all sorts of vices in the world of sports'.<sup>55</sup> The pivotal words in WADC are that WADA shall 'consider' in Article 4.3.1, and the word 'potential' in Article 4.3.1.2. Together, they give WADA immense discretion to introduce bans on doping despite the lack of evidence of *actual* enhancement. Indeed, a 2019 study revealed that '[o]nly 5 out of the 23 substance classes show evidence of having the ability to enhance actual sports performance'<sup>56</sup> and a further 2021 study by Bezuglov et al. revealed that four banned substances on PLIS (meldonium, trimetazidine, xenon and cobalt) bear no evidence of potential performance enhancement at all<sup>57</sup> — conjuring an uneasy suspicion that WADA may have actually abused the leeway afforded to it with the 'potential to enhance' criterion. The irony of this is that such vague criteria are detrimental to the integrity of sport — the very stated aim of anti-doping programs prominently mentioned in the Preamble of WADC. The lack of guidance opens the decisions on the inclusion of substances or methods to subjective determination, potentially resulting in inconsistencies and biased conclusions.

Although establishing the athlete's state of mind is irrelevant to WADA when considering whether the enhancement criterion has been fulfilled (for which there exists no relevant test), Engelberg et al. note that, in reality, 'many cases of doping feature inadvertent (or accidental) use, where no 'motive' for doping actually exists'.<sup>58</sup> In many instances, this has been because of carelessness (but, importantly, not because of intention to enhance) on the part of the athlete as to the composition of the drug purchased, as over-the-counter drugs are easily accessible and can contain a variety of banned substances, including

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<sup>55</sup> de Hon (n 49) 672.

<sup>56</sup> Jules A A C Heuberger and Adam F Cohen, 'Review Of WADA Prohibited Substances: Limited Evidence for Performance-Enhancing Effects' (2019) 49(4) Sports Medicine 525.

<sup>57</sup> Eduard Bezuglov and others, 'The Inclusion in WADA Prohibited List is not Always Supported by Scientific Evidence: A Narrative Review' (2021) 12(2) Asian Journal of Sports Medicine 1.

<sup>58</sup> Terry Engelberg, Stephen Moston and James Skinner, 'The final frontier of anti-doping: A study of athletes who have committed doping violations' (2015) 18(2) Sport Management Review 268, 269.

prohibited stimulants such as cathine, ephedrine and pseudoephedrine.<sup>59</sup> The riposte from WADA may well be that the PLIS publication is transparent and it is a duty of every athlete to stay vigilant. However, for many athletes, a dedicated backroom team of medical staff to scrutinise their diets and medicine intake is not feasible. Indeed, many athletes do not even control their own diets.<sup>60</sup> Furthermore, representing one's own country at international elite events such as the Olympics does not simply translate into access to sufficient funding to ensure compliance. For example, Canadian skeleton racer Mirela Rahneva explained that, even though she is part of the Canadian Assistance Program, she had to meet her financial needs through her own money and through setting up a GoFundMe page, with per-season expenses totalling over \$26,000.<sup>61</sup> Heavily burdened by these financial constraints, it would not be surprising if athletes failed to keep up with the ever-changing PLIS list. This problem is further exacerbated when athletes are not representing their countries (for example, in Grand Slam tennis matches) and therefore do not receive government funding. This means that, in such situations, athletes are left financially unsupported and are burdened with ensuring PLIS compliance despite not having any medical expertise. Even athletes who can afford backroom teams of support may fall victim to the constant changes: Maria Sharapova was banned from professional tennis in March 2016 after testing positive for meldonium, a drug that was only added to PLIS two months prior to her taking it, but which she had been taking for the past ten years to deal with her 'irregular heartbeat and a history of diabetes in her family'.<sup>62</sup> If even global superstars like Sharapova cannot keep up with WADA's constant changes, what hope do less well-funded athletes have?

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<sup>59</sup> David Mottram, 'Aspetar Sports Medicine Journal - Inadvertent Use of Drugs in Sport' (*Aspetar.com*) <<https://www.aspetar.com/journal/viewarticle.aspx?id=217>> accessed 26 April 2022.

<sup>60</sup> 'Athletics: Ostapchuk's coach admits drugging her food' (*The New Zealand Herald*, 2012) <<https://www.nzherald.co.nz/sport/athletics-ostapchuks-coach-admits-drugging-her-food/UCFX3LVX7HMIHJQDOY23LXICY/>> accessed 27 September 2022.

<sup>61</sup> Olivier Neven, 'Skeleton racers blast Canada's lack of Olympic funding: 'We saw \$0'' (*Yahoo Sports Canada*, 20 February 2022) <<https://uk.sports.yahoo.com/news/beijing-olympics-canadian-skeleton-racers-blast-canada-lack-of-funding-0-dollars-005753264.html>> accessed 25 November 2022.

<sup>62</sup> Les Carpenter, 'Maria Sharapova Provisionally Banned From Tennis After Revealing Failed Drugs Test' (*the Guardian*) <<https://www.theguardian.com/sport/2016/mar/07/maria-sharapova-failed-drugs-test-australian-open-2016-tennis>> accessed 26 April 2022.

The enhancement criterion is therefore one that is all-encompassing and simultaneously vague, resulting in some odd inclusions on PLIS, which is detrimental to the integrity of sport as innocent athletes are found guilty of enhancement despite lacking the requisite intention. WADA's possible retort here may be that the expansive nature of the enhancement criterion is mitigated by the third criteria: the spirit of sport. This will be discussed in Section 1.2 below. However, as we shall see further, this criterion is plagued with even more issues of its own.

## 1.2 The Spirit of Sport Criterion

Like its enhancement criterion counterpart, the spirit of sport is also not compulsory. This means that a substance/method can be included in PLIS based on the other two criteria, despite not being deemed to have violated the spirit of sport. However, in practice, it is difficult to see how the enhancement criterion is separable from that of the spirit of sport. For example, when an athlete takes a performance enhancing drug, it could be argued that they have fallen afoul of the 'honesty' value of the spirit of sport (see below), too. Indeed, WADA itself notes that 'doping is fundamentally contrary to the spirit of sport'.<sup>63</sup> This suggests that, where there is doping, there must be a violation of the spirit of sport and vice versa. As such, it appears odd that the spirit of sport criterion is *optional*. If it is indeed possible that a substance/method can enhance but not violate the spirit of sport, it is inconceivable that this criterion should be the 'fundamental rationale'<sup>64</sup> against doping. If, on the other hand, as WADA suggests, *any* doping violates the spirit of sport, then the concept is itself redundant because it would be 'superfluous to repeat the same argument twice'.<sup>65</sup>

What then exactly is the spirit of sport? WADC states that it is 'the celebration of the human spirit, body and mind. It is the essence of Olympism'<sup>66</sup> and 'Olympism' is defined in IOC's Olympic Charter as:

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<sup>63</sup> WADC (n 45) 13.

<sup>64</sup> *ibid* 13.

<sup>65</sup> de Hon (n 49) 673.

<sup>66</sup> WADC (n 45) 13.

*‘a philosophy of life, exalting and combining in a balanced whole the qualities of body, will and mind ... seeks to create a way of life based on the joy of effort, the educational value of good example, social responsibility and respect for universal fundamental ethical principles.’<sup>67</sup>*

The spirit of sport is also all the values we find ‘in and through sports’,<sup>68</sup> and 12 such values are listed in WADC and reproduced below:<sup>69</sup>

- Health
- Ethics, fair play and honesty
- Athletes’ rights as set forth in the Code
- Excellence in performance
- Character and education
- Fun and joy
- Teamwork
- Dedication and commitment
- Respect for rules and laws
- Respect for self and other participants
- Courage
- Community and solidarity

What is immediately apparent from the lexicon used is that the spirit of sport is less a definition than a characterisation or a declaration of assorted aspirational principles. The existence of this list can be traced back to various scandals dating back to the 1960s, resulting in the creation of the spirit of sport ‘ideal’, one which witnessed the transformation of the original health rationale for anti-doping into isolated attacks on morality of athletes.<sup>70</sup> In attempting to balance the interests of various stakeholders, an open-ended definition was

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<sup>67</sup> International Olympic Committee, ‘Olympic Charter’ (*Stillmed.olympics.com*, 8 August 2021) 8

<[https://stillmed.olympics.com/media/Document%20Library/OlympicOrg/General/EN-Olympic-Charter.pdf?\\_ga=2.71261845.469085637.1651305364-1539759114.1651305364](https://stillmed.olympics.com/media/Document%20Library/OlympicOrg/General/EN-Olympic-Charter.pdf?_ga=2.71261845.469085637.1651305364-1539759114.1651305364)> accessed 30 April 2022.

<sup>68</sup> WADC (n 45) 13

<sup>69</sup> *ibid* 13.

<sup>70</sup> Ian Ritchie, ‘The construction of a policy: The World Anti-Doping Code’s ‘spirit of sport’ Clause’ (2013) 2 *Performance Enhancement & Health* 194, 195.

adopted to appease the public whilst maintaining its own legitimacy.<sup>71</sup> The resulting regime was one which lacked sustainable ethical viewpoints. As such, WADA has been left with a legacy of contradictions, which have been carried forward to the present. These principles, problematically, fail to provide the much-needed definitional certainty to an otherwise mystifying notion of the spirit of sport. Unsurprisingly, it has been dismissed as ‘simply utopian’,<sup>72</sup> a ‘disparate list’<sup>73</sup> of little worth, offering only ‘an incomplete, unsystematic and unstructured account of key values in ethical sport’.<sup>74</sup> Insofar as Olympism is concerned, the concept has been criticised as seriously outdated — a futile embrace of a deeply ‘socially and historically conditioned ideal’ created by the myth of the marathon in 490 BC.<sup>75</sup>

These criticisms are not groundless: these principles are vague and far from helpful in establishing what the spirit of sport is. Indeed, these values seem applicable even outside the world of sports. For example, a person holding themselves out as a lawyer without passing the relevant exams could be considered to have a lack of respect for the ‘rules and laws’ and thereby would seem to be in violation of the spirit of sport criterion. The point here is that such a fundamental list is not tailored to sports at all. This unfortunate characteristic stems from the historic origins of the ‘spirit of sport’: the emergence of these values and the idealism of Olympism reflects the immense pressure on the Code Project Team of WADA at the turn of this century when WADC was created. Faced with scandals involving state-sponsored doping in the 1980s<sup>76</sup> and the ‘Festina’ affair<sup>77</sup> about systematic doping at the Tour de France at the end of the 1990s, much was expected from the creation of

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<sup>71</sup> *ibid* 199.

<sup>72</sup> de Hon (n 49) 671.

<sup>73</sup> Sigmund Loland and Michael J. McNamee, ‘The ‘spirit of sport’, WADA’s Code Review, and the search for an overlapping consensus’ (2019) 11(2) *International Journal of Sport Policy and Politics* 325, 333.

<sup>74</sup> Pugh and Pugh (n 51) 143.

<sup>75</sup> Loland and McNamee (n 73).

<sup>76</sup> ‘The State-sponsored Doping program’ S8 EP1: Doping for Gold (*pbs.org*, 13 June, 2011) <<https://www.pbs.org/wnet/secrets/the-state-sponsored-doping-program/52/>> accessed 25 November 2022.

<sup>77</sup> Jeremy Whittle, ‘Twenty Years on the Festina Affair Casts Shadow Over the Tour de France’ (*the Guardian*, 3 July 2018) <<https://www.theguardian.com/sport/2018/jul/03/tour-de-france-festina-affair>> accessed 26 April 2022.

WADA. WADC was needed not only to overcome the enduring problem of defining doping, but was also expected to restore the tarnished image of all of sport. Inevitably, then, the lexicon used was filled with positive and aspirational language with the goal of not just reducing the prevalence of doping, but also to provide for a central ‘educational platform’ to youngsters.<sup>78</sup>

Despite these admirable goals, almost all 12 values have come under attack in one form or another. For example, the value of ‘honesty’ has been labelled as unhelpful since an athlete using a drug not yet prohibited should not be regarded as dishonest.<sup>79</sup> By the same logic, a lack of ‘respect for rules and laws’ could not ‘be logically invoked to justify a ban [...] as they depend on the prior existence of such a ban’.<sup>80</sup> Paradoxically, it might even be argued that doping can help realise some of these values. For example, sacrificing one’s health by taking on the risk of a new experimental drug to ‘bring [one’s] athletic performance to a new level’<sup>81</sup> may be construed as ‘a sign of courage’,<sup>82</sup> and the use of doping might be seen as the pursuit of ‘excellence in performance’ and a symbol of ‘dedication and commitment’<sup>83</sup>. McNamee has attempted to offer a defence, arguing that conceptual vagueness is intrinsic to all natural languages, and cited that, in football terms, we are likely to agree to what constitutes ‘excessive force’ when applying rules prohibiting such force.<sup>84</sup> However, such an argument can hardly be convincing given the central role that the spirit of sport plays in underpinning the *entire* regulatory framework of WADA, where ambiguity only serves to amplify uncertainty and the risks of arbitrary discretion. This argument is not to suggest that WADA should adopt a strict and rigid definition of the spirit of sport; instead, as Section III suggests, a decentralised model allowing for greater input from specific sporting bodies provides for a much more realistic manner of regulation.

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<sup>78</sup> Ritchie (n 70).

<sup>79</sup> Vincent Geeraets, ‘Ideology, Doping and The Spirit of Sport’ (2017) 12(3) Sport, Ethics and Philosophy 255.

<sup>80</sup> Elizabeth Shaw, ‘Neurodoping in Chess to Enhance Mental Stamina’ (2021) 14(2) Neuroethics 220.

<sup>81</sup> Erler (n 10) 200.

<sup>82</sup> Geeraets (n 79) 258.

<sup>83</sup> WADC (n 45) 13.

<sup>84</sup> McNamee (n 46).

Another problem with this concept is that it assumes there is a ‘spirit’ that is attainable and tangible. It takes a teleological view of sports in that there is some purpose to playing and competing. Indeed, Sandel writes that ‘[a]rguments about the ethics of enhancement are always, at least in part, arguments about the telos, or point, of the sport in question, and the virtues relevant to the game’.<sup>85</sup> But the accuracy of this assertion is doubtful in an increasingly commercialised world of sports, where incentives to win far exceed the potential consequences of violating the spirit of sports; as such, many athletes no longer internalise the idea of the spirit of sport. For many athletes, the telos of sports is no longer ‘the celebration of the human spirit’, if it ever was.

Per Forbes, footballer Lionel Messi earned \$97 million in salary in 2021 alone, with a further \$33 million in off-pitch earnings, whereas an average Premier League footballer earned \$85,000 in salary per month, or \$1.02 million per year.<sup>86</sup> By comparison, the annual median UK salary in 2021, calculated using the data gathered by the Office for National Statistics, was £25,990.<sup>87</sup> These figures show that there is a huge monetary incentive for athletes to use any means possible to try and reach their athletic potential, not necessarily for the fulfilment of some idealistic view of sport, but for monetary gain. Although at significantly lower sums, chess largely operates in the same way, with income derived from prize money, sponsorships, online streaming and, at one extreme end, public corporate finance opportunities such as the listing of chess company Play Magnus on the Oslo stock exchange by the reigning world chess champion Magnus Carlsen in 2013, which had the fortune to blossom from a mere training app into the ‘only publicly traded chess company in the world’<sup>88</sup> to date.

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<sup>85</sup> Michael J Sandel, *The Case Against Perfection: Ethics in the Age of Genetic Engineering* (Harvard University Press 2007) 38.

<sup>86</sup> Ellis Cashmore, Jamie Cleland and Kevin Dixon, ‘Football Is Ready for Openly Gay Players’ (*Fair Observer*, 24 February 2021) <<https://www.fairobserver.com/culture/ellis-cashmore-jamie-cleland-kevin-dixon-openly-gay-athletes-football-lgbtq-news-17281/>> accessed 26 April 2022.

<sup>87</sup> ‘Earnings And Hours Worked, All Employees: ASHE Table 1 — 2021 Revised Edition’ (*Office for National Statistics*) <<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/allemployeesashtable1>> accessed 26 April 2022.

<sup>88</sup> Owen Poindexter, ‘How World Champion Magnus Carlsen Rode the Chess Boom’ (*Front Office Sports*, 30 November 2021)

It is not suggested here that the lure of millions of dollars in prize money and sponsorships necessarily means that athletes can no longer internalise what the spirit of sport entails. However, athletes often unsurprisingly find themselves caught in a prisoner's dilemma where the lure of financial and professional success may outweigh the risk of getting caught and receiving a ban from competition.<sup>89</sup> Savulescu et al. point out that 'the enormous rewards for the winner, the effectiveness of the drugs, and the low rate of testing all combine to create a cheating "game" that is irresistible to athletes'.<sup>90</sup> Indeed, this lure to 'cheat' is perhaps strongest amongst the majority of professional athletes who are unlikely to become founders of listed companies like Carlsen and would depend on prize money and sponsorships to maintain a living. Comparatively speaking, achieving success through 'legitimate' means, such as training and equipment, may be more expensive than through illicit doping.

Within this equation also lie the aspirations of sponsors, national bodies and fellow countrymen — sources of pride as well as pressure. Boye et al. explain that, as achievements in sports are closely tied to national pride, temptations to cheat can be stronger than respect for the rules or concerns about the health of athletes.<sup>91</sup> National funding acts as a particular pressure point that accounts for why a national athlete would choose to dope by taking a 'win at all costs' mentality.<sup>92</sup> Indeed, a direct correlation exists between the number of medals won at the Olympics and the amount of funding. For example, in 2016, Ingold and Williams completed a survey demonstrating the correlation between the level of funding from 1999 to 2015 and the total number of US Olympic medals won by the US from 2004 to 2014. The empirical evidence clearly

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<<https://frontofficesports.com/how-world-champion-magnus-carlsen-rode-the-chess-boom/>> accessed 28 April 2022.

<sup>89</sup> Julian Savulescu, Bennett Foddy and M Clayton, 'Why We Should Allow Performance Enhancing Drugs in Sport' (2004) 38 *British Journal of Sports Medicine* 666; Jill S Harris, 'Doping on Deck: The Prisoner's Dilemma of Performance-Enhancing Drugs' (2020) *The Economics of Aquatic Sports* 67.

<sup>90</sup> Savulescu and others (n 89) 667.

<sup>91</sup> Erik Boye and others, 'Doping and Drug Testing' (2017) 18 *EMBO Reports* 351-354.

<sup>92</sup> See, for example: "Athletes Have Had Enough": Money, Medals Putting Pressure on Canadian High-Performance Sport Culture | CBC Sports" (*CBCnews* April 20, 2022) <<https://www.cbc.ca/sports/olympics/olympics-canada-culture-analysis-1.6423878>> accessed 2 November, 2022



demonstrated that the most medals are won in highly funded sports, such as swimming, track and field, skiing and snowboarding.<sup>93</sup> The less funded sports, such as gymnastics and ice hockey, brought home the fewest medals.

Thus, the claim that sports are a ‘celebration of the human spirit, body and mind’ is divorced from the commercial reality that high performance is a luxury that not all athletes can afford. Sports, especially for those in less privileged countries, are often played out of necessity. Oxana Chusovitina, a decorated Olympian whose son was diagnosed with acute lymphocytic leukaemia, relocated to Germany from her home country of Uzbekistan which had no specialist oncology facilities and where her family lacked health insurance.<sup>94</sup> At the time, she noted: ‘If I don’t compete, then my son won’t live, it’s as simple as that’.<sup>95</sup> Competition is often a means of salvation, not a celebration of spirit. Even in wealthy countries, such as the US, sports are seen as a route out of poverty. LeBron James, arguably the main star of modern basketball, admitted that basketball was a ‘vehicle’ he used to ‘get to where [he] want[ed] to go’.<sup>96</sup> Reflecting on his success, he stated: ‘[w]ow, you know, we didn’t let the game of basketball use us, we used it’.<sup>97</sup> Strikingly, basketball was seen as a means to an end, and not, as WADA would suggest, an end in itself. These stories, and countless others, suggest a much more pessimistic view of sports. Rather than being a ‘celebration’, the calculation is far more utilitarian — athletes sacrifice their bodies: in the case of Chusovitina, she had to compete well past the usual age of retirement for the survival of her son.

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<sup>93</sup> David Ingold and Eben Novy-Williams, ‘Money for Medals: Inside the Performance-Driven Funding Of U.S. Olympic Teams’ (*Bloomberg*, 5 August 2016) <<https://www.bloomberg.com/graphics/2016-olympics-usoc-return-on-investment/>> accessed 30 April 2022.

<sup>94</sup> Eric Kirschbaum, “Child’s Cancer care brough gymnast to Germany” (Reuters) <https://www.reuters.com/article/us-olympics-gymnastics-chusovitina-idUSL2281235320080606> > accessed 28 October 2022

<sup>95</sup> Emma John, ‘Oksana Chusovitina’s Epic Career Provides Many Reasons to Be Tearful’ (*The Guardian*, 4 November 2018) <<https://www.theguardian.com/sport/2018/nov/04/gymnast-oksana-chusovitina-saga-brings-tear-to-eye?bcmt=1>> accessed 28 April 2022.

<sup>96</sup> Tony Manfred, ‘Lebron James Really Did Grow Up in Inner City Poverty’ (*Business Insider*, 21 June 2013) <<https://www.businessinsider.com/lebron-james-life-story-2013-6>> accessed 28 April 2022.

<sup>97</sup> *ibid.*

In sum, neither Olympism nor the list of values are of much ‘operative utility’.<sup>98</sup> It is therefore most surprising that, despite the vagueness, it has remained intact since its inception in 2003, and survived four rounds of WADC revisions. Although no changes were made in the first two rounds (the 2009 and 2015 versions), various changes were introduced during the third round (the 2019 version), which were endorsed unchanged in the fourth and the latest 2021 version, and compiled, according to WADA, ‘under the watchful eye of WADA’s Legal Department, which coordinated the work... to ensur[e] consistency and harmonization’.<sup>99</sup> Despite these changes, harmonisation is still difficult to discern, with the additions and re-orderings failing to fundamentally clarify *what* exactly the ‘spirit of sport’ means, or what the ‘underlying logic of [the chain of values] inclusion or hierarchy or coherence’ is.<sup>100</sup> In turn, what the amendments did signal is the rather unfortunate message that the spirit of sport is conceptually, and in its updated form, *alive and well*.

The spirit of sport is a tall order and has been proffered as a criterion, an underlying ‘philosophical definition’<sup>101</sup> and a ‘sound ethical justification for banning drugs and methods’<sup>102</sup> *all at once*. Despite this lofty goal, on the eve of its 20<sup>th</sup> birthday, widespread doping use and contraventions continue to exist. The Russian Federation was banned from competing in major competitions including the Olympics,<sup>103</sup> only to find that ‘neutral’ Russian athletes were allowed to compete under its ‘replacement’ Russian Olympic Committee flag. The latest drama at the Beijing Winter Olympics 2022 involved the 15-year-old ice-skating sensation Kamila Valieva, who was allowed to compete *despite*, on *any* account of *any* interpretation of the spirit of sport, testing positive for

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<sup>98</sup> Loland and McNamee (n 73) 333.

<sup>99</sup> ‘WADA Code Review’ (*WADA*, 2022)

<<https://www.wada-ama.org/en/what-we-do/world-anti-doping-code/code-review>> accessed 30 April 2022.

<sup>100</sup> Loland and McNamee (n 73) 333.

<sup>101</sup> Ritchie (n 70) 199.

<sup>102</sup> *ibid* 198.

<sup>103</sup> Billy Perrigo, ‘Russia Banned from Olympics, World Cup, For State-Sponsored Doping’ (*Time*, 9 December 2019)

<<https://time.com/5746344/russia-banned-olympics-2019/>> accessed 28 April 2022.

trimetazidine. The reason cited was that she was ‘a Protected Person’.<sup>104</sup> In 2021, it was estimated that between 10% and 40% of athletes might have cheated at the 2020 Tokyo Olympics.<sup>105</sup> Brand et al. note that ‘the percentage of doping cases which remain unrevealed is thought to be considerably higher’<sup>106</sup> and Sottas et al. suggest that blood doping was present in 14% of elite track and field athletes on average.<sup>107</sup> These astonishing statistics show that, despite WADA’s best efforts, the ‘gold medal culture’ prevails as the *de facto* spirit of sport.

### 1.3 Physical/Mind Sports Divide — Over-Inclusive

Taking a step back from the flawed two-thirds criteria, another observation can be made of WADA’s current regulation, namely that it fails to distinguish between physical and mind sports.

PLIS, compiled in accordance with the criteria in Article 4.3 of WADC, is currently sorted into substances prohibited only in competition (a smaller category disallowed 12 hours before competition), substances prohibited both in and out of competition and substances applicable to certain precision sports only (mainly beta-blockers, which reduce tremors).<sup>108</sup> This lack of distinction between physical and mind sports is unfortunate and shall be explored in more detail in Section 2.1 below. This article proposes that any future change to regulation should be firmly grounded on such a distinction if sustainable

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<sup>104</sup> ‘Beijing 2022: The ITA Informs on Figure Skater Kamila Valieva’ (*International Testing Agency*, 11 February 2022)

<<https://ita.sport/news/beijing-2022-the-ita-informs-on-figure-skater-kamila-valieva/>> accessed 29 April 2022.

<sup>105</sup> ‘Sport Is Still Rife with Doping’ (*The Economist*, 14 July 2021)

<<https://www.economist.com/science-and-technology/2021/07/14/sport-is-still-rife-with-doping>> accessed 28 April 2022.

<sup>106</sup> Ralf Brand, Wanja Wolff and Detlef Thieme, ‘Using Response-Time Latencies to Measure Athletes’ Doping Attitudes: The Brief Implicit Attitude Test Identifies Substance Abuse in Bodybuilders’ (2014) 9 *Substance Abuse Treatment, Prevention, and Policy*.

<sup>107</sup> Pierre Sottas et al, ‘Prevalence of Blood Doping in Samples Collected from Elite Track and Field Athletes’ (2011) 57 *Clinical Chemistry* 762.

<sup>108</sup> ‘WADA The Prohibited List’ (*WADA*)

<<https://www.wada-ama.org/en/prohibited-list/>> accessed 29 April 2022.

policies are to be devised — muscle building via anabolic steroids would not improve Carlsen's chess game; likewise, improved mental stamina through tDCS would not assist Usain Bolt's 100m time.

Being appreciative of the physical/cognitive divide is not to suggest that cognition is irrelevant in physical sports or that physical condition is irrelevant in mind sports. An example of the former is gymnastics: a gymnast cannot pin the perfect landing on physical aptitude alone — the gymnast must perfectly sequence and coordinate such moves through brain processing or so-called 'perceptual-cognitive skills that influence the anticipation and decision-making processes',<sup>109</sup> which sets champions apart. In other words, 'game intelligence'.<sup>110</sup> Conversely, although grandmasters can be stationed at the chess table for hours on end, chess is very much a physical activity<sup>111</sup> with players in 'faster games', for example, the World Blitz Championships (where players are only allocated five minutes each) moving 'at least 1,000 chess [pieces] in addition to 1,000 activation[s] of the chess clock by finger pressure'.<sup>112</sup>

Instead, the commitment to the physical/cognitive divide should be construed fundamentally as an appreciation of the differences in the *kind* of sport in question. For sports with a strong mental element, cognitive enhancement will be especially relevant. This includes sports that require creativity and problem-solving skills, such as chess,<sup>113</sup> bridge and Esports.<sup>114</sup> On the other hand, for sports with a more mechanical element, physical enhancement will be of special relevance. For example, the use of anabolic steroids which include natural androgens like testosterone has the effect of increasing protein within cells, especially in skeletal muscles. Ultimately, it is a matter of *degree* as to which element — cognitive or physical — a particular

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<sup>109</sup> Filipe Casanova et al., 'Expertise and perceptual-cognitive performance in soccer: A review perícia e rendimento perceptivo-cognitivo no futebol' (2009) *Uma Revisão da Literatura* 120.

<sup>110</sup> *ibid* 116.

<sup>111</sup> Sighart Golf, 'Biochemistry and Psychology of Chess and Classical Physical Exercise: Concurring or Conflicting Evidence?' (2015) 5 *Journal of Sports Medicine & Doping Studies* 3.

<sup>112</sup> *ibid*.

<sup>113</sup> Shaw (n 80) 223.

<sup>114</sup> Sergio Machado and others, 'Could Tdcs Be a Potential Performance-Enhancing Tool for Acute Neurocognitive Modulation in Esports? A Perspective Review' (2021) 18 *International Journal of Environmental Research and Public Health*.

sport is oriented towards and, whilst there inevitably is some overlap between physical and cognitive enhancement (e.g., cyclists can benefit from both EPO and tDCS for enhanced endurance),<sup>115</sup> the key is that some sports stand to benefit more from one form of enhancement than another.

Another reason to commit to this divide is that it enables the appreciation of the differences in establishing a link between doping and enhanced performance. Whilst it is often easier to establish this link in the physical domain, the same cannot be said of cognitive enhancement. For example, in the case of EPO, the link between oxygen carrying capacity and endurance performance is intimately related, but the same link does not hold for cognitive enhancement where it is difficult to pin down one specific causal link — is it the result of a change in neuroplasticity, a chemical reaction, or both? In other words, the ‘mechanism’ through which enhancement occurs is not always apparent in relation to cognition.<sup>116</sup> It is of little surprise, therefore, that sports which are more mechanical in nature exhibit higher doping figures, such as athletics and weightlifting (as shown in *Figure 2*),<sup>117</sup> accounting for 68% out of 57 Olympic medals stripped so far (from 1968-2012) at 42% and 26% respectively.<sup>118</sup>

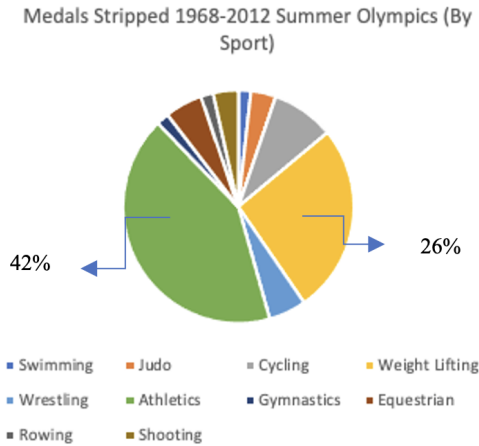
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<sup>115</sup> Petersen and Lippert-Rasmussen (n 14).

<sup>116</sup> Pugh and Pugh (n 51) 149.

<sup>117</sup> The pie chart was compiled with figures taken from Nicole He, K K Rebecca Lai and Paul Murray, ‘Athletes Who Were Denied Their Olympic Medal Moments Because Others Were Doping’ (*NY Times*, 14 August 2016) <<https://www.nytimes.com/interactive/2016/08/14/sports/olympics-medal-doping.html>> accessed 28 April 2022.

<sup>118</sup> Pugh and Pugh (n 51).



*Figure 2: He and Murray (2016)*

Although individual athletes may dope for a variety of reasons, figures do go some way to support the claim that there must be a connection between the *type* of sport and the *efficacy* of doping — with the more physical or mechanical sports deriving the greatest benefit (which, therefore, explains the higher number of dopers). It may be argued that *how* the intervention occurs is entirely irrelevant since WADA takes a strict liability approach that captures every substance that potentially enhances irrespective of *how* it enhances. This lack of appreciation of nuance supports the claim made in this article that the anti-doping regulations, as currently constructed, are intrinsically flawed and accounts for WADA's inertia to make necessary changes. This will be further discussed in Section II.

This intentional or unintentional tendency to draw misleading parallels between mind sports and physical sports will only be exacerbated by the growth in NIBS technologies, as the following Section explores.

#### 1.4 Cognitive Enhancement — Under-Inclusive and Under-Explored

Currently, PLIS sets out prohibited substances, including nootropics (S0-S9), and methods such as blood/gene manipulation (M1-M3). However, it does not *yet* prohibit NIBS or other forms of cognitive enhancement methods. This is not to say, however, that WADA does not regulate cognitive enhancement at all. To be clear, PLIS does include substances believed to enhance cognition. Oft-cited substances and their perceived areas of cognitive enhancement, together with their respective status, are set out in a non-exhaustive table below. These substances can otherwise be classified as ‘nootropics’, or pharmacological substances that have the effect of cognitive enhancement. Although there is some controversy as to the regulation of caffeine, especially after an increase in uptake by athletes after its removal from PLIS,<sup>119</sup> the general consensus around nootropics is that there is an obvious enhancing effect that justifies their regulation.

	Substance	Cognitive enhancing effect	PLIS listed?
1	Amphetamine	Improve consolidation of information, leading to improved recall <sup>120</sup>	Yes (S6 — in competition)

<sup>119</sup> Neil Chester and Nick Wojek, ‘Caffeine Consumption Amongst British Athletes Following Changes to the 2004 WADA Prohibited List’ (2008) 29 *International Journal of Sports Medicine*.

<sup>120</sup> Kara Simone Bagot and Yifrah Kaminer, ‘Efficacy of Stimulants for Cognitive Enhancement in Non-Attention Deficit Hyperactivity Disorder Youth: A Systematic Review’ (2014) 109 *Addiction*.

2	Caffeine	Increase alertness, attention and performance, <sup>121</sup> improve endurance	No — expressly excluded from S6 class
3	Methylphenidate	Improve performance in novel tasks, reduce planning latency in complex tasks <sup>122</sup>	Yes (S6 — in competition)
4	Modafinil	Improve reaction time, logical reasoning, problem solving <sup>123</sup>	Yes (S6 — in competition)

Although this table shows that there is some degree of consideration of the effects of cognitive enhancement by WADA, two realities render the current regulation ineffective. First, this article contends that, although WADA does ban substances capable of cognitive enhancement, it does not do so through a systematic, considered and principled approach. Since WADA's inception, much attention has been paid to prohibit physical enhancement — to be precise, physical doping in physical sports — commonly through the use of drugs such as steroids and EPO with headline-grabbing cases. Examples include Lance Armstrong,<sup>124</sup> Tyson Gay<sup>125</sup> and, more recently, the UK athletics 4x100m relay team being stripped of their silver medal at the Tokyo 2020 Olympics.<sup>126</sup>

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<sup>121</sup> Bernadette Marriott, 'Food Components to Enhance Performance: An Evaluation of Potential Performance-Enhancing Food Components for Operational Rations' [1994] Institute of Medicine (US) Committee on Military Nutrition Research.

<sup>122</sup> *ibid* 315.

<sup>123</sup> *ibid* 315.

<sup>124</sup> 'Lance Armstrong 'Stripped' Of Tour de France titles and banned' (BBC Sport, 24 August 2012) <<https://www.bbc.com/sport/cycling/19369375>> accessed 28 April 2022.

<sup>125</sup> Gene Cherry, 'U.S. Sprinter Tyson Gay Banned One Year for Doping' (*Reuters*, 2 May 2014) <<https://www.reuters.com/article/us-athletics-gay-doping-idUSKBN0DI1ED20140502>> accessed 21 April 2022.

<sup>126</sup> Ben Rumsby, 'Team GB Stripped of Olympic Men's 4x100m Relay Silver Medal for Doping Violation' (*The Telegraph*, 18 February 2022)



Conversely, much less attention has been paid to cognitive enhancement, in both physical and mind sports, especially in the latter. To date, no chess-player has tested positive for a violation of PLIS. Generally speaking, the impact of cognitive enhancement feeds into all sports, although benefits are perceived to be more pronounced in mind sports and appropriate WADA policies can only be formulated when these nuances are appreciated and well understood.

Secondly, given that WADA currently regulates the use of some substances that may cognitively enhance (for example, Ritalin)<sup>127</sup> but not all (for example, NIBS technologies that promise to offer multiple cognitive enhancing benefits), there exists a glaring (and growing) regulatory gap for emerging cognitive-enhancing technologies, such as tDCS, tRNS, tACS and EEG. In other words, WADA does not currently regulate *all* the ways in which an athlete can be cognitively enhanced, which means there is a potential regulatory vacuum, which is far from satisfactory. Mindful of this regulatory vacuum, along with the underexplored area of cognitive enhancement, this article will seek to address this lacuna with the help of tDCS and chess, which shall now be turned to.

## **PART B: A CASE FOR NEURO-DOPING?**

This article will now turn to analyse the use of tDCS within WADA's framework, and whether it would be considered a prohibited technique. The following will establish that under the two-thirds criteria, tDCS could in theory be banned by WADA.

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<<https://www.telegraph.co.uk/olympics/2022/02/18/team-gb-stripped-olympic-mens-4x100m-relay-silver-medal-doping/>> accessed 28 April 2022.

<sup>127</sup> 'WADA Therapeutic Use Exemptions' (*WADA*)

<<https://www.wada-ama.org/en/athletes-support-personnel/therapeutic-use-exemption-s-tues>> accessed 29 April 2022.

### 1.5 Can tDCS be banned under current WADA regulations?

#### a) *Health criterion*

There is general ‘scientific consensus so far ... that tDCS poses no major health risks’.<sup>128</sup> Indeed, there has been growing recognition of therapeutic use of this technology in areas such as MDD.<sup>129</sup> Therefore, it likely does not fulfil the health criterion.

#### b) *Enhancement criterion*

There are no known direct studies on the effect of tDCS on chess, but two areas of cognitive enhancement are particularly relevant and will be singled out to establish a correlation with chess performance: memory and mental fatigue. The prevailing view in the literature as to the importance of memory in chess is illustrated by the Chunking hypothesis, developed initially by de Groot in a chess experiment.<sup>130</sup> The hypothesis purports that ‘the differences in the ability of chess players at different skill levels to copy and to recall positions are attributable to the experts’ storage of thousands of chunks ... in long-term memory [LTM]’.<sup>131</sup> With that, a logical conclusion can be drawn: to the extent that memory recall is adversely impacted, so is LTM and, hence, chess performance. This point may be of special significance for high-level competition where recollection of the opponent’s specific preparatory materials, including a vast repertoire of openings, variations and tactics, is invaluable. In

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<sup>128</sup> Shaw (n 80) 219; see also Laura Sophie Imperatori, Luke Milbourn and Mirko Daniel Garasic, ‘Would the Use of Safe, Cost-Effective tDCS Tackle Rather Than Cause Unfairness in Sports?’ (2018) 2 *Journal of Cognitive Enhancement* 377-387.

<sup>129</sup> NHS, “Treatment - Clinical Depression” (NHS)

<<https://www.nhs.uk/mental-health/conditions/clinical-depression/treatment/>>

accessed November 26, 2022.

<sup>130</sup> Adrianus Dingeman de Groot, *Thought and Choice in Chess* (Amsterdam University Press 2008).

<sup>131</sup> Fernand Gobet and Herbert A Simon, ‘Expert Chess Memory: Revisiting the Chunking Hypothesis’ (1998) 6 *Memory*.

relation to mental fatigue, a study was conducted by Salehi et al.<sup>132</sup> in 2021 into the effects of tDCS on the dorsolateral prefrontal cortex regarding mental fatigue and physical performance in professional swimmers. This study concluded that anodal tDCS ‘reduces adverse effects of mental fatigue’ in swimming performance. Although these conclusions were made in the context of swimming, reduction of the adverse effects of mental fatigue is not sport-limited, and Salehi et al.’s conclusion can be extrapolated to apply to Ghorbani et al.’s 2020 study, which found that exposing chess players to mental fatigue ‘impaired pattern recall performance of expert chess-players’.<sup>133</sup>

The link that can be drawn between Ghorbani’s chess study and Salehi’s tDCS study is this:

- P1: tDCS can cause a reduced sensation of mental fatigue in swimmers and in elite chess players alike.
- P2: mental fatigue impacts pattern recall.
- P3: affected ability to recall impacts on LTM and, hence, on chess performance.
- C: improved mental stamina generated by tDCS (as hypothesised) will therefore enable chess players to tap into the chunks of their LTM for longer, thus allowing better recall and a delay in any drop in performance.

Alternatively put, tDCS may create a delay in playing an incorrect move out of fatigue or perception of fatigue (assuming a wrong move is unavoidable at some point) which, *in theory*, increases the player’s chances of winning by avoiding, or delaying, the need to make a series of subsequent moves to ‘save’ the predicament generated by an earlier mistake. As such, a delayed onset of fatigue, or perception of fatigue, may alter the course of the rest of the game (and, possibly, the ultimate result). In this manner, chess players may be cognitively enhanced by tDCS. Bearing in mind that WADA bans what may *potentially* enhance, it is demonstrated here that, at the very least, tDCS does have this

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<sup>132</sup> Elahe Nikooharf Salehi and others, ‘Transcranial Direct Current Stimulation Reduces the Negative Impact of Mental Fatigue on Swimming Performance’ (2021) 54 *Journal of Motor Behavior* 327-336.

<sup>133</sup> Saeed Ghorbani, ‘Effects of Mental Fatigue on Memory Function of Expert Chess Players’ *Iranian Journal of Learning and Memory* 2020 2(8).

potential to enhance in chess. With this in mind, the enhancement criterion would likely be considered fulfilled.

c) *Spirit of sport criterion*

In Section 1.2, the shortcomings of the spirit of sport were identified, with the vagueness inherent in its definition especially questioned. Indeed, this lack of a precise definition of the spirit of sport means that it is difficult to apply this criterion to tDCS. For the purposes of this article, ethical grounds underpinning the concept will be examined in determining if the spirit of sport has been violated. To this end, three of the most recent key amendments to the Preamble (suggested to be indicative of WADA's latest policy direction) will be examined:

- **Hard Work**: The word 'ethical' has been inserted before 'pursuit of excellence' to read: 'this intrinsic value is often referred to as the "spirit of sport": the *ethical* pursuit of human excellence through the dedicated perfection of each Athlete's natural talents' (emphasis added).<sup>134</sup> This addition laid down an open-textured requirement of being 'ethical', for which there is no universal consensus as to its meaning. However, since this was stated to be achieved 'through dedicated perfection', the virtues of hard work and commitment can be implied. This ethical justification is premised on the basis that enhancement reduces the need for effort, thus undermining the 'essence' of a sport. The contention is that doping corrodes character and 'reduces the suffering, pain, hard work, and effort that are essential for real and worthy achievements'.<sup>135</sup> Effort and perseverance are admired because they are morally valuable, under the individual's control,<sup>136</sup> and reflect transferable skills benefiting society.<sup>137</sup> It follows that doping must be deplored, as it reduces the need to 'effortfully overcome obstacles to

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<sup>134</sup> WADC (n 45).

<sup>135</sup> Maartje Schermer, 'Enhancements, Easy Shortcuts, and the Richness of Human Activities' (2008) 22(7) *Bioethics*.

<sup>136</sup> John Martin Fischer and Mark Ravizza, *Responsibility and Control* (Cambridge University Press 2008).

<sup>137</sup> Emilian Mihailov and Julian Savulescu, 'Social Policy and Cognitive Enhancement : Lessons From Chess' (2018) 11 *Neuroethics*.

peak performance' and undermines the admirable nature of athletic achievements.<sup>138</sup>

- **Authenticity**: The addition of the statement, 'the spirit of sport is expressed in how we play true'<sup>139</sup> implies and reinforces ethical claims based on 'authenticity' or 'no cheating'. Indeed, WADA has, since 2014, celebrated annually a 'Play True Day' dedicated to 'clean sports'.<sup>140</sup> In philosophical terms, the 'play true' theory objects to cheating through doping, as the athlete no longer remains their authentic self.<sup>141</sup> This objection is associated with the fear of the 'creation of inauthentic personalities' and of changing our minds in such a way 'that it will be difficult for us to attribute moral accountability' and, as a corollary, praise the cheating athlete.<sup>142</sup> This theory regards success through external aid as less admirable and talent 'bought' less worthy, and holds that sometimes it is "better to respect "the given" than to try to better things using human abilities".<sup>143</sup> Another common denominator of the objection is a 'general unease about making "the essence of human nature" a project of technological mastery'.<sup>144</sup>
- **Equality and Fairness**: The addition of a new paragraph refers to 'anti-doping programs [that] seek to maintain the integrity of sport in terms of respect for rules, other competitors, fair competition, a level playing field'.<sup>145</sup> This addition appears to reinforce the oft-discussed ethical concept of 'equality and fairness'. This ethical justification holds that doping in sports erodes the equality and fairness of competition

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<sup>138</sup> Erler (n 10) 192.

<sup>139</sup> WADC (n 45).

<sup>140</sup> 'WADA Play True Day 2022' (*WADA*, 2022)

<<https://www.wada-ama.org/en/play-true-day>> accessed 29 April 2022.

<sup>141</sup> Michael J Sandel, 'What's Wrong with Enhancement' (2002) *The President's Council on Bioethics*.

<sup>142</sup> Alberto Carrio Sampedro and José Luis Pérez Triviño, 'On the Compatibility of Brain Enhancement and the Internal Values of Sport' (2017) 11 *Sport, Ethics and Philosophy* 316.

<sup>143</sup> Bostrom and Sandberg (n 7) 327.

<sup>144</sup> *ibid* 326.

<sup>145</sup> WADC (n 45).

by enabling one competitor to have an advantage over others. WADA is committed to a two-tiered version of fairness: equal opportunity and fair competition. This notion of equality has lately been reflected in WADA's commitment to 'raise the game' through a modernised logo in 2022 in the form of a 'square that represents the rules and customs of the game and the equal sign that evokes fairness with a human touch' (*Figure 3*).<sup>146</sup>



*Figure 3*

Taking these principles at face value, an argument for the prohibition of tDCS by WADA may be constructed as follows. First, given the evidence cited above in relation to the improvement of mental stamina and chess, WADA may argue that the increased time until exhaustion felt by chess players means that they will not need to work as hard to achieve the same results. A similar conclusion can be reached from tDCS studies on cycling<sup>147</sup> and swimming<sup>148</sup> which showed evidence that tDCS can help reduce (the perception of) exhaustion. Therefore, on some level, it appears that tDCS reduces the need for hard work. Secondly, it might be argued that, because tDCS has the potential to enhance, athletes would not 'play true' because they are no longer performing to the best of their innate abilities but rather performing only as well as tDCS allows them to. Finally, it might be argued that the use of tDCS lends itself open to the challenges of enabling an athlete to gain an unfair advantage — a chess-player who uses a

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<sup>146</sup> 'WADA Unveils Refreshed Brand' (*WADA*, 2022)

<<https://www.wada-ama.org/en/news/wada-unveils-refreshed-brand-launch-its-new-website>> accessed 29 April 2022.

<sup>147</sup> Marcelo Vitor-Costa and others, 'Improving Cycling Performance: Transcranial Direct Current Stimulation Increases Time to Exhaustion in Cycling' (2015) 10(12) *PLoS One*.; Alexandre Hideki Okano and others, 'Brain Stimulation Modulates The Autonomic Nervous System, Rating Of Perceived Exertion And Performance During Maximal Exercise' (2013) 49 *British Journal of Sports Medicine*.

<sup>148</sup> Salehi and others (n 133).

tDCS headset to increase mental stamina arguably gains an advantage over other non-users. In this manner, without further scrutinising the merits of the spirit of sport criterion itself, this criterion appears fulfilled. Thus, it is reasonable to speculate that, as tDCS has the *potential* to enhance performance, and as it seemingly flouts the spirit of sport as defined by WADA, it is likely that tDCS and similar technologies would be prohibited based on the two-thirds criteria outlined above.

However, in the following Section, this article will argue that the above reasoning is untenable and that these underlying ethical principles are unconvincing at best and deeply flawed at worst — *even* in the context of physical sports in which they were originally articulated. For now, it is sufficient to say the following: the fact that under WADA's current regulatory framework tDCS can be taken to satisfy the two-third criteria for being added to PLIS (by virtue of the fact that it can potentially fulfil both the enhancement and the spirit of sport criteria) suggests deeply rooted issues within WADA's framework.

## II. DECONSTRUCTING WADA'S REGULATIONS

Section I highlighted four key problematic areas in WADA's anti-doping regulations and concluded by establishing that tDCS could, in theory, come within WADA's purview. This Section will now seek to disentangle these issues and discuss the problems that tDCS and chess help bring to the fore.

### 2.1 The Mental/Physical Divide

As highlighted in Section 1.3, the compilation of PLIS in accordance with Article 4.3 of WADC makes no distinction between mental and physical sports, and the illustrative example of tDCS in chess accentuates WADA's deficiencies in the following manner.

First, if WADA indeed imposes a ban on tDCS, all forms of sport would be caught as no distinction is drawn between physical and mental sports. This is problematic because *different sports have different values*. By imposing a blanket ban, WADA would fail to recognise the core values of (and hence the

spirit of sport unique to) that particular sport which WADA purports to protect in the first place.

Although the ostensible purpose of every sport is to compete and win, the values underlying each sport (and therefore the corresponding ethical justifications for regulating doping for that sport) are different. For example, whilst the core values of marathon running are resilience, determination and stamina, in other sports, such as gymnastics, there is an emphasis on poise, flexibility and agility; in shooting, what is valued is accuracy, steadiness and consistency. Values of chess are arguably more difficult to pinpoint, with former world chess champion Anatoly Karpov once remarking that '[c]hess is everything: art, science and sport'.<sup>149</sup> Notwithstanding, it appears that 'the value of chess lies primarily with the intellectual and creative'<sup>150</sup> pursuit of excellence and, as such, showcasing superior (physical) stamina is not the primary purpose of chess. Shaw provides a useful comparison: 'the value of running a marathon is more closely connected with stamina and a marathon runner who took a physical stamina enhancement might be accused of missing/undermining the point of marathons ... The value of a work of art, such as a painting, [on the other hand] does not seem to depend on how the artist got the energy to create it'.<sup>151</sup> In response to the potential criticism that chess is not directly comparative to art, Shaw further uses performing art, such as ballet, for comparison.<sup>152</sup> Whilst part of the appreciation of ballet is the stamina exhibited by ballerinas (in being able to dance for long periods of time), stamina is not the primary reason for appreciation. Indeed, the same can be said about chess — the appreciation of chess does not lie in *how* the chess-player obtains their energy to last through the tournament.

At this point, an important distinction must be made between two overlapping but crucially distinct concepts: 'skills' and 'values'. The former refers to the ability to perform an action, typically learned or acquired through practice or training; for example, balancing, skipping or throwing in physical sports. In mind sports, this can be arithmetic ability, hand-eye coordination and

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<sup>149</sup> Krzysztof Olechnicki, 'The sociological paradox of chess: the transclass distinction of the game of kings' (2020) *Acta Universitatis Lodziensis Folia Sociologica* 49, 58.

<sup>150</sup> Shaw (n 80) 222.

<sup>151</sup> *ibid.*

<sup>152</sup> *ibid.*



even mental stamina. The concept of ‘values’, on the other hand, denotes the abilities and qualities necessary for the successful pursuit of a particular sport (e.g., resilience, teamwork and commitment). It is argued here that any improvement of mental stamina via the use of tDCS which may have the potential to enhance chess performance (see Section 1B) should not be confused with or taken to undermine the central values of chess, including its value as an intellectual and creative pursuit requiring determination, perseverance, and hard work — as discussed in detail in Section 2.3(i).

Going one step further, it has been argued by some that cognitive enhancement cannot make a professional chess-player much better at the game.<sup>153</sup> Golf has noted that cognitive enhancement drugs could only have effects ‘with persons at low cognitive baseline’<sup>154</sup> and that, with ‘normal’ persons, cognitive enhancement is ‘still below clinical significance’. Hence, it is at least doubtful that cognitive enhancement drugs as currently constituted could enhance chess expertise, much less so at a professional level.<sup>155</sup> Instead, Golf has suggested that 60% of the FIDE rating of a chess-player is attributable to these variables: the player’s age of entry into a chess club, the number of tournament games played, emotion expression control, numerical intelligence, actual age and, finally, chess-related performance motivation.<sup>156</sup> To add to this list, an effective nutrition regime can help accumulate ‘super compensated glycogen’ in the brain, muscle and liver.<sup>157</sup> Perhaps it is these factors which have led to many professional chess players feeling insulted at the insinuation that doping in chess is possible. Indeed, since 2002, top chess players have been protesting against the introduction of doping tests in chess by FIDE, with GM Artur Jussupow, once German champion, declaring that FIDE’s lack of clear definitions meant that such tests placed players “at the mercy of FIDE” and “remind[ed] [him] of the Stalin methods during the thirties”.<sup>158</sup> Having conducted experiments ‘for around twenty years’, Dr Helmut Pfleger, himself

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<sup>153</sup> Mihailov and Savulescu (n 138).

<sup>154</sup> Sighart Golf, 'Doping For Chess Performance' (2015) 5(3) *Journal of Sports Medicine & Doping Studies*.

<sup>155</sup> Golf (n 111) 5.

<sup>156</sup> Golf (n 155).

<sup>157</sup> *ibid*.

<sup>158</sup> 'Controversy Over FIDE Doping Check' (*Chessbase*, 2002)

<<https://en.chessbase.com/post/controversy-over-fide-doping-check>> accessed 27 September 2022.

both a medical doctor and a chess grandmaster, also expressed doubts about the correlation between doping and chess, stating that “both mentally stimulating and mentally calming medication have too many negative side effects”.<sup>159</sup> In sum, it is argued that doping cannot give a pronounced advantage to professional chess players and cannot replace hard work as the pathway to success.

Turning now to WADA’s lack of discernment regarding the physical/mental divide and the idiosyncrasies of each sport, the risk of overinclusion is significant. The problem with such a lack of sensitivity is that a ban on tDCS and other cognitive enhancers would apply indiscriminately to all sports, regardless of the differing core values, even if the core values of a sport are unlikely to be challenged by the use of tDCS. As argued above, in the case of chess, improvement of mental stamina would not undermine the values of what makes a good chess-player. Since the ‘ability to keep playing for a long time without becoming fatigued does not seem central to the *value* of chess’,<sup>160</sup> the value of chess as a pursuit of excellence is not fundamentally challenged by the use of tDCS or any associated enhancement of mental stamina, and thus the central purpose and values of chess are preserved.<sup>161</sup> Doping regulations and policies formulated without regard to the true values of a sport have the benefit of easy administration but are founded on rather indefensible and precarious grounds.

Furthermore, not only does WADA’s over-inclusive regulation fail to capture the differences between physical and mind sports, but it is also poorly, if at all, suited to capture the nuances between the different types of mind sports themselves. Esports is a good example. Whilst the objective in chess is relatively straightforward — checkmating your opponent — the objectives in different Esports range from demonstrating superior reaction times, memory recall, or concentration power. This effectively means that, as *between* mind sports (that is, chess versus Esports) and even *within* a particular mind sport (that is, Esports), different sets of core values dominate, making indiscriminate application of anti-doping rules all the more problematic. Relatedly, over-inclusion, or a blanket prohibition, by WADA could be criticised as artificial — a source of mistrust

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<sup>159</sup> *ibid.*

<sup>160</sup> Shaw (n 80) 222.

<sup>161</sup> *ibid* 220.

and fear. Mihailov and Savulescu are correct in pointing out that regulations based on the lack of the physical/cognitive divide are at risk of ‘creating a detrimental culture of suspicion that ascribes unwarranted blame’.<sup>162</sup>

## 2.2 Cognitive Enhancement

Hitherto, the regulation of WADA’s cognitive enhancement through PLIS compiled pursuant to Article 4.3 has very much been an afterthought as the construction of the framework has largely been responsive to scandals around physical sports. Furthermore, because of WADA’s deontological framework, there has been, conveniently, no reason to examine the nuances involved in cognitive enhancements, including *how* and *to what degree* a cognitive enhancement may impact either a physical or a mind sport. The focus on whether there is *potential* to enhance means that WADA overlooks the fact that, unlike physical enhancement, cognitive enhancement generally does not operate in a linear fashion.

This is particularly pertinent to chess and tDCS because chess performance cannot be tied to monolithic factors and is instead influenced by a multitude of complex variables. For example, whilst the above has established that tDCS may help with the mental stamina of a chess-player, this alone is not enough to guarantee improved performance. As mentioned above, other relevant factors include attention and information processing. Mind sports, as opposed to physical sports, are characterised (and powered) by cognitive complexity composed of a variety of specialised cognitive abilities. Relative to physical sports, the correlation between enhancement and intervention in mind sports is more difficult to establish. For example, empirical evidence of increased oxygen supply post-blood doping leading to an increase in the power of endurance can be more easily established than the correlation between the quality of a chess move pre and post-tDCS usage, bearing in mind that the particular move (or, effectively, the combination of moves as chess players calculate prior to taking the *first* of a *series* of moves) is the sum of processing, calculation, and memory recall in addition to the ability to withstand fatigue. Therefore, in the example of tDCS and chess, the current deontological approach of WADA under Art 4.3.1 demands that tDCS be banned because it

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<sup>162</sup> Mihailov and Savulescu (n 138) 116.

has the *potential* to enhance mental stamina — but this is not the same as saying that tDCS *can* enhance chess performance. Mental stamina is only one of a number of pertinent factors.

Chess and tDCS further expose the deontological approach in this way: it is conceivable that enhancement of one cognitive aspect, for example, alertness (brought on by an increase in mental stamina via tDCS), can be *detrimental* to the overall performance as it impacts on other factors, such as the chess-player's faculty of information processing, since increased alertness may cause players to become hyper-focused on one point resulting in a net loss of performance. Indeed, a 2017 study<sup>163</sup> showed that modafinil has the ability to calm the nerves of chess players *but* ultimately caused them to lose on time due to slower play and prolonged thinking brought on by the drug. In this manner, a deontological approach would ban tDCS *despite* the fact that it *could* be detrimental to the overall performance.

In conclusion, although cognitive enhancement brought on by NIBS techniques can indeed enhance certain aspects of performance, the complexity of mind sports means that such techniques cannot enhance holistically. Chess and tDCS have demonstrated that mental stamina enhancement is only one facet of a larger cognitive process and, importantly, such an enhancement would not violate the core value of chess as seen in Section 2.1, making a blanket ban unreasonable and patronising. WADA must therefore acknowledge the nuances of cognitive enhancement: a *consequential* approach based on *actual* enhancement is more suitable and just — a point to which this article will return in the final Section.

This article now turns to the fundamental ethical justifications for prohibiting doping.

### 2.3 Spirit of Sport

In Section 1.5(c), the argument that the spirit of sport criterion might be violated by using tDCS in the context of chess was discussed, relying on WADA's principles of hard work, authenticity, and fairness. At the same time,

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<sup>163</sup> Franke and others (n 37).

the strength of that argument was questioned, which this article will now seek to analyse. This Section will aim to deconstruct these principles and examine how the policies underpinning anti-doping rules fail not only to live up to expectations but to stand on their own merits. Furthermore, the use of tDCS in the context of chess prompts additional and pertinent philosophical considerations that may further undermine the validity of these principles as constitutive of the very foundation of the spirit of sport. However, it should be noted that, since these principles underpinning the anti-doping regulations themselves make no distinction between physical and mental sports, it would not be appropriate to confine this discussion to a pure mind sport/chess context; instead, broader references, where relevant, will be made to physical sports to achieve a holistic discussion.

i) *Enhancement does not necessarily reduce the need for hard work*

The assumption that tDCS *removes* the need for hard work, and therefore is an unacceptable intervention, is unsubstantiated. In fact, the opposite is true — tDCS may actually *enhance* hard work.

In the context of chess, the ergogenic effects of tDCS cannot take away the value of effort which enables the player to attain his/her FIDE rating in the first place. Charness et al. confirm the correlation of ‘time spent on serious study alone, tournament play, and formal instruction’ with ‘chess skills as measured by tournament performance ratings’.<sup>164</sup> Significantly, it is the amount of training time, *not* intelligence, that is ‘one of the most effective prognostic factor[s] for achieving chess expertise’.<sup>165</sup> Importantly, tDCS does not reduce the amount of training time needed to reach the same performance level by enhancing mental capabilities. Instead, tDCS enables chess players to train for longer — a subtle yet important distinction. If tDCS were to be able to cut short the time needed for training, this would be equivalent to a ‘shortcut’. However, it is suggested here that this is not the case — the time invested to reach different levels of expertise remains unchanged. To reach their level of competence, it has been estimated that grandmasters spend at least 5,000 hours

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<sup>164</sup> Neil Charness and others, ‘The Role of Deliberate Practice in Chess Expertise’ (2005) 19(2) Applied Cognitive Psychology 151.

<sup>165</sup> Golf (n 111).

of chess training time ‘during the[ir] first decade of serious chess play’,<sup>166</sup> a critical period where studies have shown that ‘expos[ure] to a chess environment at an early age [...] is important for development skills’.<sup>167</sup> Specifically, it has been estimated that ‘unrated players reported more than 8,000 hours; rated but untitled players reported close to 12,000 hours; FIDE Masters almost 20,000 hours and International Masters 28,000 hours of dedication to chess’.<sup>168</sup> These numbers paint a clear picture: expertise in chess cannot be detached from the hours spent practising. Even with the use of tDCS, the same number of hours would need to be invested. In terms of pattern recognition alone, it has been commented<sup>169</sup> that ‘a very good chess player remembers at least 300,000 chess positions’ prior to being ‘able to recognize and then to compare and to act’.<sup>170</sup> Computer program MAPP calculated the need to acquire up to 100,000 patterns<sup>171</sup> to reach Master level, while another computer program CHREST shows that ‘at least 300,000 chunks are required to reach grandmaster level’.<sup>172</sup> Mathematically speaking, tDCS can in no way substitute the effort required to acquire hundreds of thousands of patterns within tens of thousands of hours of practice — there is simply no shortcut to the hard work required and there can certainly be no ‘quick fix’.<sup>173</sup> tDCS cannot replace the amount of time and effort that goes into becoming an elite chess-player. Effort, in many ways, is simply unavoidable.

In fact, building on this argument, an unqualified concept of ‘hard work’ as a basis for the anti-doping sentiment is problematic — there is an argument to be made that the use of tDCS is in fact *evidence* of hard work. tDCS could allow a chess-player to devote more time to ‘tackling challenges that are inherent in worthwhile activities’,<sup>174</sup> such as searching for the perfect move

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<sup>166</sup> Charness and others (n 65).

<sup>167</sup> Fernand Gobet and Guillermo Campitelli, ‘The Role of Domain-Specific Practice, Handedness, and Starting Age in Chess.’ (2007) 43 *Developmental Psychology* 27.

<sup>168</sup> Golf (n 111) 5.

<sup>169</sup> *ibid* 3.

<sup>170</sup> *ibid* 3.

<sup>171</sup> Herbert A Simon and Kevin Gilmarin, ‘A simulation of memory for chess positions’ (1973) 5 *Cognitive Psychology* 29-46.

<sup>172</sup> Fernand Gobet and Neil Charness ‘Expertise in Chess’ [2006] *The Cambridge Handbook of Expertise and Expert Performance* 11.

<sup>173</sup> Shaw (n 80) 221.

<sup>174</sup> *ibid* 222.

when in competition or solving chess puzzles, learning new openings or improving endgame tactics when in training. Indeed, Shaw has gone as far as to argue that tDCS can ‘enable professional chess-players to practise for longer, thereby leading to more effort and perseverance overall’.<sup>175</sup> In agreement, Maslen et al. have further added<sup>176</sup> that the choice to use a less arduous route in achieving the same goal may in fact demonstrate greater commitment and hard work. In this manner, tDCS does not detract from the hard work required but should be considered a reduction in principle of the perception of the ‘influence of mental barriers to top performance’.<sup>177</sup> By pushing harder, an athlete’s chances of maximising performance are increased. A counterargument may be leveled here that tDCS allows chess players to achieve the same level quicker than they would have been able to without the technique because they can train for longer. Two responses here are offered: first, there is still actual effort, and it is important to distinguish this from perceived effort, or indeed no effort. By analogy, it has been noted that the use of timetables in studying may decrease the overall effort needed and make the task more efficient by ‘externally control[ling] one’s weakness of will’.<sup>178</sup> Likewise, where a chess-player chooses to use more efficient methods of training, like tDCS, this is not fundamentally different from setting a timetable for studying with the goal of increasing productivity,<sup>179</sup> which in truth reflects the player’s commitment and dedication to perfecting their game. Such time can be used, for example, to engage with cognitive training aids such as ‘chess boards, chess books, building chess images, visual observation of chess games, vocational training with chess, metacognitive training’.<sup>180</sup> Secondly, if chess players can achieve the same level quicker, this allows them to exert more time to improve their chess game *further*, elevating the overall standard in chess. In turn, to use WADA’s own terms, tDCS can in fact facilitate the ‘pursuit of human excellence’.<sup>181</sup>

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<sup>175</sup> *ibid* 221.

<sup>176</sup> Hannah Maslen, Julian Savulescu and Carin Hunt, ‘Praiseworthiness and Motivational Enhancement: ‘No Pain, No Praise?’ (2019) 98 *Australasian Journal of Philosophy* 304–318.

<sup>177</sup> Erler (n 10).

<sup>178</sup> Maslen et al (n 177).

<sup>179</sup> Shaw (n 80).

<sup>180</sup> Golf (n 155).

<sup>181</sup> WADC (n 45).

A final observation must be made here in relation to how we understand social acceptability of drugs in performance. The ergogenic effects of tDCS on chess players can be likened to those of beta-blockers used by classical musicians. Beta-blockers can lower heart rate, blood pressure, and control stage fright. In the context of music, it can help classical musicians express their skills better, resulting in a deserving performance reflective of their true ability.<sup>182</sup> Taking this one step further, arguably, the most famous band ever, the Beatles, wrote entire albums inspired by their experimentation with narcotics and psychedelics.<sup>183</sup> In the context of visual arts, the use of narcotics such as opium was at one point common, with Pablo Picasso perhaps being the most prominent example.<sup>184</sup> The point here is that, on some level, the use of narcotics and other substances (which may or may not offer an immediate advantage and may even at times be detrimental to performance) as an *enhancement* of performance has historically been a socially acceptable, if not encouraged, phenomenon. The evident riposte to this argument is that arts are unlike sports, for the latter focuses on the competitive aspect, allowing only one winner. Three responses can be offered. Firstly, whilst there is no ‘winner’ or ‘loser’ in relation to arts, it is nonetheless often competitive with equally large stakes at play. Secondly, battling fatigue is not the central focus of the spirit of sport in chess, just as battling stage fright is not the essence of musical performances. Thirdly, and more fundamentally, on a closer reflection of WADA’s own terms of the ‘dedicated perfection of each Athlete’s natural talents’,<sup>185</sup> there is an emphasis on the amplification of talent that an athlete *already* possesses. Much like how narcotics and psychedelics may have inspired the Beatles to write the hit song ‘Lucy in the Sky with Diamonds’ (in its abbreviated form — LSD — also the abbreviation for lysergic acid diethylamide, a psychedelic drug), and how opium inspired Picasso’s paintings, such as the ‘Family of Saltimbanques’,<sup>186</sup> the use of

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<sup>182</sup> Savulescu and others (n 89) 667.

<sup>183</sup> Mikal Gilmore, ‘Beatles’ Acid Test: How LSD Opened the Door to ‘Revolver’ (*Rolling Stone*, 25 August 2016)

<<https://www.rollingstone.com/feature/beatles-acid-test-how-bsd-opened-the-door-to-revolver-251417/>> accessed 29 April 2022.

<sup>184</sup> Jeff Goldberg, ‘The Complicated Relationship Between Opium and Art in the 20<sup>th</sup> Century’ (*Artsy*, 4 May 2018)

<<https://www.artsy.net/article/artsy-editorial-complicated-relationship-opium-art-20th-century>> accessed 29 April 2022.

<sup>185</sup> WADC (n45).

<sup>186</sup> Goldberg (n 185).



tDCS might be said to amplify the talent *already* in existence. Therefore, rather than removing the need for hard work, tDCS, just like the use of narcotics, has the potential to allow the true expression of the ‘natural talent’ of a chess-player. This argument of ‘true expression’ will be further explored below in the discussion on ‘authenticity’, to which we now turn.

ii) *Enhancement does not necessitate a loss of authenticity*

The claim that tDCS and other enhancements might create ‘inauthentic personalities’ falls into the fallacy of assuming that there exists an ‘authentic self’ which would be lost if external aid were to be relied upon. Yet, clearly, we would not consider an individual with a prosthetic leg to have lost moral agency, nor would we call someone in a wheelchair a person who has lost culpability or human freedom. Their equipment/treatment (i.e., ‘enhancement’) makes them no less ‘human’. The likely response is that a wheelchair or a prosthetic is a therapy, not an enhancement, the idea being that interventions should be allowed for ‘treatments responding to genuine medical needs’ but not for enhancements that ‘satisfy mere preferences or expensive tastes’.<sup>187</sup> Indeed, WADA recognizes the therapeutic value of banned substances or methods and outlines rules for therapeutic use exemptions (TUE), which essentially allows an athlete to use a medication or method if certain criteria are met including its use for treatment of a diagnosed medical condition and there exists ‘no reasonable, permitted, alternative treatments’.<sup>188</sup> For instance, the famous gymnast Simone Biles utilised TUE in Rio 2016 for Ritalin (methylphenidate), a banned substance,<sup>189</sup> which she took to manage her ADHD symptoms.<sup>190</sup>

This therapy/enhancement line serves a Herculean function: that of demarcating the legitimate from the illegitimate. It is tasked with assisting the important ethical adjudication of *when* individual choice and autonomy to engage

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<sup>187</sup> Alexandre Erler, ‘The limits of the treatment-enhancement distinction as a guide to public policy’ (2017) 31 *Bioethics*.

<sup>188</sup> WADA TUE (n 128).

<sup>189</sup> PILS (n 108).

<sup>190</sup> Meredith Cash, ‘Simone Biles’ ADHD medication is banned in Japan, but a Tokyo 2020 exemption allowed them for athletes’ (*Insider*, 30 July 2021), <<https://www.insider.com/simone-biles-adhd-meds-banned-japan-impacting-performance-2021-7>> accessed 26 November 2022.

with a technology should be allowed to prevail over regulations.<sup>191</sup> The key question in this context is whether a line can be drawn in any principled fashion. This article suggests that it cannot.

The difficulty with drawing such a distinction is especially highlighted by the introduction of NIBS technologies such as tDCS, given the growing recognition of therapeutic use of tDCS in areas such as MDD, with the National Institute for Health and Care Excellence endorsing it as a treatment for depression.<sup>192</sup> It is conceivable that if, in time, tDCS were to be banned, an elite chess-player with MDD could apply through FIDE's TUE scheme<sup>193</sup> and obtain the right to use it with all the ergogenic effects tDCS potentially brings. In such circumstances, the use of tDCS is restorative — depression should not inhibit one's ability to perform in chess tournaments. On the other hand, if we accept the premise that tDCS can enhance performance in chess, would one say that a depressed chess-player using tDCS has gained an advantage that they would not otherwise have had and therefore be regarded as 'inauthentic'? This example illustrates the difficulty in drawing a neat distinction between enhancement and treatment.

This observation in the context of tDCS can also be made in the context of various other sports as well. Returning to gymnast Biles, would one say, for example, that the improved cognitive power of Biles to concentrate balances with the goal of restoring her therapeutically? Alternatively, one might take a view that it is possible Ritalin aided Biles in her successes by enhancing her skills to achieve a score she would not otherwise have obtained. In addition, one must consider where this line should be drawn: should TUE be allowed to restore Biles to the level of an average gymnast (with normal concentration levels), or that of an Olympic gymnast (presumably, with superior concentration power)? Arguably, if we understand WADA's notion of 'natural talents', the latter

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<sup>191</sup> Isabel Karpin and Roxanne Mykitiuk "Going out on a Limb: Prosthetics, Normalcy and Disputing the Therapy/Enhancement Distinction" (2008) *Medical Law Review* 16.3, 413-436.

<sup>192</sup> NICE, 'Transcranial direct current stimulation (tDCS) for depression' (NICE, 16 August 2015), <<https://www.nice.org.uk/guidance/ippg530/chapter/1-recommendations>> accessed 29 April 2022, pt1.

<sup>193</sup> FIDE, 'Therapeutic Use Exemptions application form' (*FIDE Handbook*, 2018) <[https://handbook.fide.com/files/handbook/TUE\\_application\\_form.pdf](https://handbook.fide.com/files/handbook/TUE_application_form.pdf)> accessed 29 April 2022.

must be true — Biles should be able to express her true talent without being hindered by ADHD, which is beyond her control. On the other hand, some would contend that ADHD is just like any other defect, such as height, weight, foot size, propensity for nerves, etc, that may affect a gymnast's performance. In this sense, Biles' ADHD should be considered as part of her 'authentic' self, and only by competing with naturally given talent can an athlete 'play true'. This tension in where the line should be drawn is a fallacy because of the assumption that such a line does actually exist. There can be no such line and, indeed, some have argued that an assertion of its existence is merely 'shifting lines in the sand'.<sup>194</sup> Indeed this 'line' between treatment and enhancement is an impractical one to draw, and therefore an inadvisable one to use.

Take another example of Oscar Pistorius, the champion paralympic sprinter fitted with blades who applied to run in the able-bodied Olympics and succeeded. Were his blades a treatment or an enhancement, or were they once a treatment turned into an enhancement? It is impossible to accurately answer this question as to whether an advantage above what is therapeutically 'acceptable' was gained. For this reason, the decision to allow Pistorius to run in the 2012 London Olympics was not without controversy,<sup>195</sup> especially given that the issue of whether the prosthesis 'provided him with an overall net advantage or disadvantage'<sup>196</sup> was never explored at the hearing. The permitted use of a pair of J-shaped 'Cheetah' blades contrasts sharply with a small pill innocently taken for therapeutic purposes to treat common cold by 16-year-old Romanian gymnast Andreea Raducan at the order of her team doctor.<sup>197</sup> Unlike the fortune of Pistorius, Raducan was stripped of the coveted all-round Women's Individual

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<sup>194</sup> Patrick Lin, 'Therapy and Enhancement: Is There a Moral Difference?' (*Genetic Engineering and Biotechnology News*, 1 July 2009)

<<https://www.genengnews.com/magazine/116/therapy-and-enhancement-is-there-a-moral-difference/>> accessed 29 April 2022.

<sup>195</sup> Jeré Longman, 'An Amputee Sprinter: Is He Disabled or Too-Abled?' (*The New York Times*, 15 May 2007)

<<https://www.nytimes.com/2007/05/15/sports/othersports/15runner.html>> accessed 30 April 2022.

<sup>196</sup> Court of Arbitration for Sport *Pistorius v IAAF* (2008) [37]

<sup>197</sup> Nick Zaccardi, 'Andreea Raducan will not be reinstated as 2000 Olympic all-around champion after meeting with IOC president' <<https://olympics.nbcsports.com/2015/06/25/andreea-raducan-olympics-medal-stripped-gymnastics-sydney-2000-romania/>> accessed 7 October 2022.

Olympic title.<sup>198</sup> In the words of the then Romanian Olympic Committee President Ion Tiriac, the medicine was “not enhancing but diminishing [to] performance”.<sup>199</sup> The differing treatment of these athletes raises the question of where this line between enhancement and treatment should be drawn, and whether the drawing of such a line is ever even possible.

The harsh result from the Raducan case is also further evidence of the absurd decisions reached by WADA’s strict regime. Their focus on the behaviour of athletes rather than the outcome is in fact harmful to authenticity. Whilst it is beyond the scope of this essay to delve into the academic intricacies of the ‘thick’ and ‘thin’ conceptions of authenticity, one can view authenticity for what it is not: where one’s true character (i.e., the qualities unique to an individual) is being suppressed, they cannot be acting ‘authentically’. In Raducan’s case, it was clear that the common cold had indeed suppressed her ability to perform at her best, and to punish her for attempting to perform authentically was a hypocritical and retrograde stance. Even if the pill Raducan had taken did enhance her performance, this is not substantively different from Biles’ use of Ritalin. The only clear distinction is that Biles had applied for TUE and Raducan had not. As such, what WADA is punishing the athlete for is not the enhancement that affects authenticity or some substantive unfairness created but administrative errors. It is then arguable that this is not the behaviour to be expected from a body purporting to protect the rights of athletes and the fairness of competition.

At this juncture, of relevance is WADA’s interpretation of ‘natural talents’ underlying the concept of authenticity, which is questionable when considered in the context of the growing transgender/hyperandrogenic classification debate. In this debate, there are, on one hand, hyperandrogenic athletes, such as Caster Semenya, who possess higher than normal levels of testosterone and, on the other, transgender athletes, such as Lia Thomas. In relation to Semenya, even though her gender is ‘uncontroversially female’ and

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<sup>198</sup> *ibid.*

<sup>199</sup> Amy Shipley, 'Romanian Gymnast Stripped of Gold' (*The Washington Post*, 26 September 2000)

<<https://www.washingtonpost.com/archive/sports/2000/09/26/romanian-gymnast-stripped-of-gold/e8c4f17a-a86a-41ce-b281-9d71b496d96f/>> accessed 1 May 2022.

that she is legally so regarded,<sup>200</sup> she has consistently faced hurdles, notably, the World Athletics announcing in 2018 rules that prohibit athletes with disorders of sex development (DSD) from competing.<sup>201</sup> In April 2019, CAS dismissed Semenya's request for arbitration on the basis that she had failed to establish that the then IAAF's eligibility classifications were 'invalid'<sup>202</sup> (CAS' Judgment) and further that, although the regulations were found 'discriminatory', such discrimination was a 'necessary, reasonable and proportionate means of achieving the legitimate objective of ensuring fair competition in female athletics'.<sup>203</sup> Although this was CAS' judgment and not WADA's, notably, WADA did commission a study<sup>204</sup> which suggested that hyperandrogenic athletes do have a competitive advantage. In this manner, it appears that WADA likely agrees with the IAAF's conclusion that Semenya should take testosterone suppressing substances.

Here, it appears that WADA does not seem to care as much about what comes naturally as it does about what is being *enhanced*, as evidenced by the stipulation to suppress what seems to be the enhancer — testosterone. In reality, other forms of genetic predispositions that enhance athletes' performance are not uncommon and there is evidence to support the claim that record-breaking athletes are often genetic outliers. This idea is explored more in the next subsection below, but some simple examples here will help illustrate the point: Lance Armstrong had a 'preternaturally high maximum oxygen consumption and superbly efficient oxygen use',<sup>205</sup> volleyball great Flo Hyman had Marfan

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<sup>200</sup> Julian Savulescu, 'Ten Ethical Flaws In The Caster Semenya Decision On Intersex In Sport' (*The Conversation*, 2019) <<https://theconversation.com/ten-ethical-flaws-in-the-caster-semenya-decision-on-inter-sex-in-sport-116448>> accessed 26 September 2022.

<sup>201</sup> Court of Arbitration for Sport, 'Executive Summary Caster Semenya, Athletics South Africa, IAAF' (*CAS*, 2019) <[https://www.tas-cas.org/fileadmin/user\\_upload/CAS\\_Executive\\_Summary\\_\\_5794\\_.pdf](https://www.tas-cas.org/fileadmin/user_upload/CAS_Executive_Summary__5794_.pdf)> accessed 28 September 2022. ('CAS Executive Summary').

<sup>202</sup> *ibid.*

<sup>203</sup> *ibid.* 1.

<sup>204</sup> 'IAAF To Use Study Saying Female Athletes Get Large Testosterone Boost In Rule Appeal - Olympictalk | NBC Sports' (*OlympicTalk* | *NBC Sports*, 2017) <<https://olympics.nbcsports.com/2017/07/03/female-track-and-field-athletes-testosterone/>> accessed 26 September 2022.

<sup>205</sup> J. Michael Bostwick and Michael J. Joyner, 'The Limits Of Acceptable Biological Variation In Elite Athletes: Should Sex Ambiguity Be Treated Differently From Other Advantageous Genetic Traits?' (2012) 87 *Mayo Clinic Proceedings*.

syndrome ‘that gave her the tall stature and long arms that likely contributed to her success’<sup>206</sup> and, at the time of writing, only four of the top 50 marathon times in the world are not achieved by runners from Kenya or Ethiopia<sup>207</sup> — an impressive feat attributable to their ‘slight, lithe physiques and exposure to high altitudes’.<sup>208</sup> If WADA does not take issue with such natural biological endowments/enhancements as being prohibitive to the ‘authentic’ self, then surely Semenya should equally be free to express herself authentically. The stance WADA and the World Athletics have taken — that higher levels of testosterone are detrimental to authentic performance — is self-conflicting given that similar prohibitions do not exist for athletes with other forms of ‘superior’ biological traits. A full discussion on the legal and ethical implications of CAS’ judgment to uphold the World Athletics’ ban on Semenya<sup>209</sup> is beyond the scope of this article, but suffice it to say that WADA’s implicit approval of the World Athletics’ stance offers an inconsistent and untenable view on how they interpret ‘natural talent’.

Transgender athletes, such as Lia Thomas, can be distinguished from athletes such as Semenya. Whilst Semenya was born with a naturally higher testosterone level relative to other female athletes, elevated levels of testosterone in Thomas were a result of her conscious decision to transition. It has been argued that this deliberate therapy-turned-enhancement gave her an unfair competitive advantage and led to her 500m freestyle victory at the NCAA’s Women Championship (although this assertion that she actually gained an advantage has been challenged<sup>210</sup>). In this situation, regardless of whether her performance was actually enhanced, it can be argued that the transition had allowed her to be her *authentic* self. Thomas herself recently commented that, “I transitioned to be happy, to be true to myself”.<sup>211</sup> In this scenario, what is true is

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<sup>206</sup> *ibid.*

<sup>207</sup> World Athletics | Marathon - Men - Senior - Outdoor' (*worldathletics.org*, 2022) <<https://www.worldathletics.org/records/all-time-toplists/road-running/marathon/outdoor/men/senior>> accessed 27 September 2022.

<sup>208</sup> Bostwick and Joyner (n 206).

<sup>209</sup> For example, see Savulescu (n 201).

<sup>210</sup> Io Dodds, 'Critics Accuse Trans Swimming Star Lia Thomas Of Having An Unfair Advantage. The Data Tells A Different Story' (*Independent*, 2022) <<https://www.independent.co.uk/news/world/americas/lia-thomas-trans-swimmer-ron-desantis-b2091218.html>> accessed 26 September 2022.

<sup>211</sup> 'Lia Thomas Says She Transitioned To Be Happy, Not To Win Swimming Titles' (*The Guardian*, 2022)

that *enhancement enabled authenticity*. Whether or not it is *fair* for Thomas or other transgender athletes to swim in the female category is beyond the scope of this discussion, particularly since Thomas and the NCAA fall outside WADA's purview. The pertinent point to stress, however, is this: in the case of Semenya, her 'enhancement' is her authentic self and, in the case of Thomas, her 'enhancement' *allowed* her to reach her authentic self. In both cases, there are respectable grounds to argue they competed *authentically* within the meaning of that word and thus any sentiment that enhancement is detrimental to authenticity must be flawed.

Paradoxically, outside this therapy/enhancement distinction, it may even be asserted that tDCS can in fact *enhance* the authenticity of athletes and of chess players alike. It is suggested that part of authenticity is 'self-creation', the idea that, by attempting to get better via whatever means, is an act of authenticity. This view takes the stance that part of authenticity is aligning oneself with one's authentic urges. In terms of chess, with a reduction in mental fatigue after the use of tDCS, players in competition are arguably motivated to play even better, to push beyond their limits and to go the extra mile to achieve their 'authentic selves'. In general, external aids should not be seen as categorically objectionable in the name of authenticity. Furthermore, is it not true that, in many cases, external aids, otherwise known as shortcuts, are already tolerated? For example, spike shoes — which enable a better grip of the running surface — are allowed in sprinting; vibration dampening tennis rackets 'designed to mitigate frame vibration'<sup>212</sup> which delay muscle fatigue are allowed in tennis; and maltodextrin, a form of energy gel that enables athletes to 'maintain ... energy levels until the end of the game'<sup>213</sup> is widely used in football. In some cases, external aids may be deemed to have gone too far, for example, Nike's Alphafly shoes which have been banned by the World Athletics. However, this is

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<<https://www.theguardian.com/sport/2022/may/31/lia-thomas-trans-swimmer-univers-ity-of-pennsylvania-ncaa-title>> accessed 26 September 2022.

<sup>212</sup> Yeh I-L and others, "Vibration-Damping Technology in Tennis Racquets: Effects on Vibration Transfer to the Arm, Muscle Fatigue and Tennis Performance" (2019) 1 Sports Medicine and Health Science 49.

<sup>213</sup> Dan Sheldon, 'Southampton Medical Checks, Gels and Team Talks Between 60<sup>th</sup> -70<sup>th</sup> Minute: Coincidence Or Plan?' (*The Athletic*, 2022)

<[https://theathletic.com/3128906/2022/02/16/southampton-medical-checks-gels-and-team-talks-between-60th-70th-minute-coincidence-or-plan/?source=emp\\_shared\\_article](https://theathletic.com/3128906/2022/02/16/southampton-medical-checks-gels-and-team-talks-between-60th-70th-minute-coincidence-or-plan/?source=emp_shared_article)> accessed 15 March 2022.

an extreme case where the shoes have been estimated to have 'lowered the energetic cost of running by 4% on average' and translate to about a '3.4% improvement in running velocity'.<sup>214</sup> Improvements by such amounts have been equated to 'technological doping'.<sup>215</sup> In general, however, external aids have largely been accepted as part of sports.

In the cognitive sphere, laptops are used and specially designed with AI programs facilitating students' learning; in some campuses, students are not forbidden from taking Ritalin for better focus in exam preparations (in addition to other enhancing substances, such as caffeine, snack bars and glucose drinks). In the chess world, chess engines, such as Fritz and ChessBase, are not prohibited and are known to be good training aids for chess players. These, and countless others, are examples of how cognitive enhancements extend and complete a person's talents, promoting authenticity by 'offloading irrelevant, repetitive, or boring tasks' through external aids which 'enabl[e] a person to concentrate on more complex challenges that relate in more interesting ways to his or her goals and interests'.<sup>216</sup> Bostrom is right when he asserts that, 'insofar as cognitive enhancements amplify the capacities required for autonomous agency and independent judgment, they can help a person lead a more authentic life'.<sup>217</sup> In a world of rapid technological advances, we should embrace the inevitable changes and the benefits they provide. This does not mean we should indiscriminately accept them; rather, parameters need to be drawn for their appropriate application. Accordingly, the time is ripe for WADA to do the same for tDCS.

In this manner, it is difficult to be convinced that tDCS could categorically result in a loss of authenticity amongst chess players. If anything, with better mental stamina, a player can train for longer, think harder and achieve better results — the makings of a more authentic player and self. In terms of the broader regulatory framework, the uncertainties surrounding the

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<sup>214</sup> James Witts, 'Technological Doping: The Science Of Why Nike Alphaflys Were Banned From The Tokyo Olympics | BBC Science Focus Magazine' (*Sciencefocus.com*, 2021)

<<https://www.sciencefocus.com/the-human-body/nike-alpha-fly-banned-technological-doping/>> accessed 15 March 2022.

<sup>215</sup> *ibid.*

<sup>216</sup> Bostrom and Sandberg (n 7) 321.

<sup>217</sup> *ibid* 327.



therapy/enhancement distinction and the fallacy of the assumption that doping/enhancement is necessarily contrary to authenticity means that this is a troublesome ethical principle for WADA. When placed in the context of the biological differences debate, the argument that doping would result in a loss of authenticity is both manifestly contradictory and hypocritical.

iii) *Enhancements such as tDCS can promote the principles of equality and fairness*

Regarding the goal of fairness, WADA's Ethics Panel is tasked with ensuring the provision of 'equal opportunity and [the facilitation of] fair competition'<sup>218</sup> in a world where 'individuals are fundamentally different and not equal, and the circumstances under which athletes might have to train are not the same'.<sup>219</sup> In short, WADA commits to a two-tiered version of fairness composed of equal opportunity and fair competition. The section below deals with each in turn. The reality, as is suggested, is that both of these goals are, under the current regime, unrealistic.

In terms of equal opportunity, it is apparent that existing inequalities render this goal fanciful. For example, it is readily apparent that athletes from richer countries have better access to (non-illicit) enhancing methods, such as hypoxic tents, better training facilities, better diets and better physiotherapists. Indeed, evidence suggests that sporting success correlates with government funding. Australia devoted \$547 million to sports funding in the years prior to the Athens Olympics — and brought home 17 gold medals.<sup>220</sup> In simple terms, they likely won more because they spent more.<sup>221</sup> Deducing that one's opportunity is ultimately defined by which country one represents, Park argues that the use of tDCS is unfair because it helps to further perpetuate this economic inequality 'as only athletes of means would likely benefit from the

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<sup>218</sup> 'WADA Ethics Panel: Guiding Values in Sport and Anti-Doping' (*WADA*, October 2017)

<<https://www.wada-ama.org/en/resources/wada-ethics-panel-guiding-values-sport-and-anti-doping>> accessed 29 April 2022.

<sup>219</sup> *ibid.*

<sup>220</sup> Savulescu, Foddy and Clayton (n 89) 668.

<sup>221</sup> *ibid.*

technique'.<sup>222</sup> Since the notion of 'fairness requires that rich and poor athletes have equal opportunities to win',<sup>223</sup> it follows that, as Park argues,<sup>224</sup> allowing the use of tDCS is to advantage rich athletes with access to better opportunities, strengthening the argument for a WADA ban. However, this argument is flawed: it fails to appreciate that tDCS devices cost much less on a relative scale as compared with other forms of enhancement methods. As Park himself notes,<sup>225</sup> the starting price of these devices for athletes is around \$500. Would this pricing not be more appealing in terms of funding as compared to, say, a \$75,000 Hydroworx pool that Mo Farah used as his underwater treadmill?<sup>226</sup> It may be the case that even \$500 is a high amount for athletes in certain countries, but it certainly goes towards leveling the playing field much more than other more expensive enhancements. Given that wealthier athletes already have access to various expensive performance enhancing devices, and recognising that countries like Australia can afford to (and actually do) fund athletes and produce champions and medals, why is it then that athletes from poorer countries should be estopped from benefiting from access to this relatively cheap form of neuro-enhancement? Admittedly, it is notionally difficult to establish a threshold of money spent to render an unfair advantage, but given that there are permitted devices, such as the Babolat tennis racket capable of recording ball spin and speed that costs close to \$400, the use of tDCS should be within the acceptable range unless 'one can give a good moral argument for why it is only tDCS, out of all types of equipment, that should be banned'.<sup>227</sup>

In the context of chess, a similar story emerges. Chess success correlates with the amount of government funding, with India tipped to be the dominant force in the world of chess in the coming years. In 2019, the Indian government announced an increase in grants from 4 crore to 5.5 crore for

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<sup>222</sup> Kwangho Park, 'Neuro-Doping: The Rise of Another Loophole to Get Around Anti-Doping Policies' (2017) 3 *Cogent Social Sciences*.

<sup>223</sup> *ibid* 4.

<sup>224</sup> *ibid*.

<sup>225</sup> *ibid*.

<sup>226</sup> 'Cutting Edge Science at Mo Farah's Oregon Training Camp' (*British Journal of Sports Medicine*, 20 April 2012)  
<<https://blogs.bmj.com/bjbm/2012/04/20/cutting-edge-science-at-mo-farahs-oregon-training-camp/>> accessed 29 April 2022.

<sup>227</sup> Petersen and Lippert-Rasmussen (n 14).

development of youngsters and top chess players.<sup>228</sup> Funding is crucial for travelling to tournaments, receiving scholarships and winning prize monies. In countries lacking funding, whether governmental or commercial, the same kind of inequality exists, which means that the introduction of the relatively cheap tDCS may be a tool to equalise the lack of such funding by aspiring chess masters. In turn, the introduction of tDCS does not inhibit fair opportunity but promotes it.

Turning now to the fair competition argument, it is argued that this is an unrealistic ideal if fair competition is understood in either the strict sense of absolute equality in competition, or the sense that athletes should not have an unfair advantage. This is in large part because some individuals inevitably benefit from the ‘genetic lottery’. Finnish skier Eero Maentyranta, for example, who won two Olympic gold medals in 1964, enjoyed a genetic mutation ‘naturally’ giving him 40-50% more red blood cells compared to the average.<sup>229</sup> Similarly, Michael Phelps, the most decorated Olympian of all time, enjoys ‘disproportionately long arms and overly lax joints’,<sup>230</sup> giving him a competitive advantage in swimming races. We see this trope appear in the game of chess as well. For example, Howard’s 2011 study suggests that ‘natural talent affects chess expertise development’<sup>231</sup> and that ‘chess-prodigies probably do have great natural talent’,<sup>232</sup> with various other studies noting a link between chess skill and IQ.<sup>233</sup> We do not, however, require chess players to be categorised by IQ points, just like we do not require Phelps to compete in categories with other athletes who have the same wingspan to height ratio. Conversely, what sport competitions do is try to ‘eliminate or compensate for inequalities between individuals and groups upon which they exert little or no control and for which

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<sup>228</sup> Sagar Shah, ‘The Contribution of The Government Towards Indian Chess – Chessbase India’ (*Chessbase India*, 12 August 2019)

<<https://chessbase.in/news/The-support-by-Government-of-India-towards-Indian-chess>> accessed 29 April 2022.

<sup>229</sup> Savulescu, Foddy and Clayton (n 89) 667.

<sup>230</sup> Bostwick and Joyner (n 206).

<sup>231</sup> Robert W Howard, ‘Longitudinal Effects of Different Types of Practice on the Development of Chess Expertise’ (2011) 26 *Applied Cognitive Psychology*.

<sup>232</sup> Robert W Howard, ‘Linking Extreme Precocity and Adult Eminence: A Study of Eight Prodigies At International Chess’ (2008) 19 *High Ability Studies*.

<sup>233</sup> Guillermo Campitelli and Fernand Gobet, ‘Deliberate Practice’ (2011) 20 *Current Directions in Psychological Science*.

they cannot be held responsible'.<sup>234</sup> To this end, 'women do not generally compete with men in tennis competitions'<sup>235</sup> or in weightlifting competitions (although one potential exception is of transgender women and intersex athletes, especially after the recent reversal of the Olympic guidelines in relation to transwomen,<sup>236</sup> as well as the approval by IOC to allow transgender athlete Laurel Hubbard to compete at the 2020 Tokyo Olympics),<sup>237</sup> and heavyweight boxers do not fight lightweight competitors. Equipment is standardised and classification systems operate on criteria such as biological sex, body mass and age. Even jockeys in horse races are weighed before every race and water-saddled to equalise weight differences. The concept of equality is clear, transparent and principled. As such, the current sporting world evidently tolerates a degree of 'unfairness' and simply seeks, insofar as possible, to reduce its effects. In fact, it could be argued that tDCS, when used in chess competitions, could serve to do just this. On the policy level, Bostrom and Sandberg note that, as it relates to the 'talent gap, some individuals at 'the low end of the performance spectrum'<sup>238</sup> have the potential to benefit more than those 'at the high end whose brains are already functioning close to their biological optimum'.<sup>239</sup> Hence, allowing the use of tDCS would help close the chess skill gap and help achieve the goal of 'fairness'. Indeed, Tännsjö goes as far as to argue for the idea of 'biological egalitarianism', holding that, if we have the opportunity to level out our skills through the use of neuro-enhancements, we should do so.<sup>240</sup> He holds that WADA has hitherto taken a 'fascistoid

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<sup>234</sup> Sigmund Loland, 'Performance-Enhancing Drugs, Sport, and the Ideal of Natural Athletic Performance' (2018) 18 *The American Journal of Bioethics*.

<sup>235</sup> Jim Parry and Irena Martínková, 'The Logic of Categorisation in Sport' (2021) 21 *European Journal of Sport Science* 5

<sup>236</sup> Sean Ingle, 'Trans Women Should Not Have to Reduce Testosterone, Say New IOC Guidelines' (*The Guardian*, 16 November 2021)

<<https://www.theguardian.com/sport/2021/nov/16/trans-women-should-not-have-to-reduce-testosterone-say-new-ioc-guidelines>> accessed 29 April 2022.

<sup>237</sup> Tariq Panja and Ken Belson, 'Olympics' First Openly Transgender Woman Stokes Debate on Fairness' (*The New York Times*, 31 July 2021)

<<https://www.nytimes.com/2021/07/31/sports/laurel-hubbard-trans-weight-lifting.html>> accessed 29 April 2022.

<sup>238</sup> Bostrom and Sandberg (n 7) 329.

<sup>239</sup> *ibid.*

<sup>240</sup> Torbjörn Tännsjö, 'Neuro-Doping as a Means to Avert Fascistoid Ideology In Elite Sport' (2021) 14 *Neuroethics* 169-178.

ideology' which suggests that those who are naturally stronger should win over those who are weaker and argues that neuro-doping can help 'liberate elite sport from its perverse view of fairness'.<sup>241</sup> Surely, on this account, Tännsjö must be correct — it is not consistent to argue that we should have fair competition whilst at the same time maintaining our commitment to the acceptability of not equalising genetic and economic conditions. This is instinctively true: when a chess player plays a wrong move, we do not blame it on the genetic disadvantage of being less intelligent or having a poorer memory or shorter attention span; instead, we regard it as their mistake of miscalculation, a human error attributable to a lack of preparation or a lapse in judgement. If this is true, then surely, where there *is* a genetic disadvantage, there should be a 'prima facie moral obligation' to allow the enhancement of disadvantaged individuals,<sup>242</sup> because the game of chess should not be fundamentally reduced to a battle of genetics.

In this manner, the use of tDCS in chess and other mind sports at the very least does not seem to contravene the fairness of the sport — both in terms of equal opportunity and fair competition. Indeed, it appears that the two-pronged approach by WADA is unrealistic and hard to achieve.

The above Sections on hard work, authenticity and fairness have each shown that the ethical dimensions of the 'fundamental rationale' of the spirit of sport embraced in WADC fail to stand up to scrutiny. It has been shown that the use of tDCS does not necessarily remove hard work in chess but may in fact be construed as an example of commitment to the pursuit of excellence. It has also been shown that the authenticity argument is flawed because it is not plausible for WADA to draw a clear line between therapy and enhancement, which means that it is impossible for WADA to devise rules or a set of policies based on this imaginary 'line' with any conceivable consistency or accuracy. Furthermore, via tDCS in chess, it was suggested that certain forms of doping may in fact *aid* in the expression of an athlete's authentic self. Finally, the idea of fairness as a cornerstone of WADC was questioned in light of the inevitable economic, social and genetic inequality that otherwise pervades. It was again proffered that tDCS may go some way to alleviating these inequalities. These conclusions are not to suggest, however, that ethical justifications for regulation

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<sup>241</sup> *ibid.*

<sup>242</sup> Jeeseo Nam, 'Biomedical Enhancements As Justice' (2013) 29 *Bioethics* 126-132.

are unimportant; the issue here is that the current ethical justifications have difficulty standing on their own merits and, when applied in the context of tDCS and chess, are further challenged and undermined. It is abundantly clear that WADA must replace its current rules with more suitable ones underpinned by sound philosophies capable of withstanding scrutiny.

Indeed, any sound regulatory framework should be ethically and philosophically justified if it is to retain legitimacy. Legitimacy on a global scale is a pressure point for WADA and one that will only be exacerbated by an arbitrary framework. Despite the ratification by 191 countries of the UNESCO International Convention against Doping in Sport, which, in practice, allows governments ‘to align domestic laws and policies with [WADC],’<sup>243</sup> WADA continues to be plagued with concerns of conflicts of interest. Half of WADA’s core funding is derived from the IOC at \$34.6 million, while half of the board’s seats, that is ‘six out of 12 seats on the executive board’<sup>244</sup> have been conferred on the IOC (with the other half appointed by governments around the world). In turn, WADA regulations are heavily influenced by politics. Notably, the rejection of a WADA proposal to impose a total ban on Russia after revelations of state-concerted efforts of doping due to a critical rejection vote from a member of IOC sent a ‘chilling message’ that WADA is merely a ‘service provider [rather] than a shaper of its policy’.<sup>245</sup> Furthermore, WADA does not enjoy close relationships with NADOs, the independent organisations in charge of testing their countries’ athletes. In particular, it is difficult for WADA to effectively monitor NADOs as differing financial constraints have necessitated a ‘vast gap [...] between testing programs in various countries’.<sup>246</sup> On the other hand, NADOs seldom view WADA positively as its decisions ‘[a]re seen as

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<sup>243</sup> ‘Lebanon becomes 191<sup>st</sup> country to ratify UNESCO Anti-Doping Convention’ (*WADA*, 2020)

<<https://www.wada-ama.org/en/news/lebanon-becomes-191st-country-ratify-unesco-anti-doping-convention>> accessed 2 October 2022.

<sup>244</sup> Eddie Pells, ‘IOC’s Large Role In Anti-Doping Creates Conflict Of Interest’ (*AP NEWS*, 2019)

<<https://apnews.com/article/winter-olympics-ap-top-news-olympic-games-edwin-mose-s-health-596457e4286d4c56a8394881a022665d>> accessed 28 September 2022.

<sup>245</sup> *ibid.*

<sup>246</sup> *ibid.*

arbitrary and d[o] not always reflect NADOs' opinions and priorities'.<sup>247</sup> An extensive elaboration of the power relationships is beyond the scope of this article, but it suffices to say that WADA has reached a critical point that, if the ethical and philosophical justifications for its anti-doping regulatory framework are not at least strengthened, their legitimacy would be further questioned. Policies that rest on sound principles provide at least a common basis for countries and organisations alike to cooperate going forward. Any delay in addressing these issues would only set back IOC's and WADA's respective attempts to protect their powers and to remain a 'trust device'.<sup>248</sup> This difficulty has in part stemmed from the eagerness that IOC and WADA have so far exhibited, causing them to '[trap] themselves within their own staged discourse', 'outbidding promises of clean sport, which turned ineffective and even toxic'.<sup>249</sup>

In summary, it is crucial that a solid and realistic framework based on sound ethical principles that can appeal to relevant stakeholders is in place. This article will now turn to the final Section to discuss a proposed framework.

### **III. CONSTRUCTING THE FUTURE - ALTERNATIVE PATHWAYS FOR FUTURE REGULATION**

This final Section draws on the lessons learnt from the above discussions and offers suggestions for how WADA's anti-doping regulatory framework should be reformed.

Criticisms against WADA's anti-doping policies and suggestions for amendments have generated a spectrum of academic debate, which this article has attempted to summarise. On one end are those such as Savulescu's, who hold that athletes are 'condemned to cheat' as the goal of 'cleaning up the sport is unattainable'.<sup>250</sup> Instead, Savulescu posits that regulation should be focused on the welfare of the athlete, seeing that '[o]ur crusade against drugs in sport has

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<sup>247</sup> Ekain Zubizarreta and Julie Demeslay, 'Power Relationships Between The WADA And Nados And Their Effects On Anti-Doping' (2021) 8 *Performance Enhancement & Health*.

<sup>248</sup> Fabien Ohl, Lucie Schoch and Bertrand Fincoeur, 'The Toxic Doxa Of "Clean Sport" And IOC'S And WADA'S Quest For Credibility' (2020) 56 *International Review for the Sociology of Sport* 1116-1136.

<sup>249</sup> *ibid.*

<sup>250</sup> Savulescu, Foddy and Clayton (n 89) 666.

failed. Rather than fearing drugs in sport, we should embrace them'.<sup>251</sup> On the other end of the spectrum, Sandel argues that allowing enhancements would be tantamount to 'eroding human agency'<sup>252</sup> and that our admiration of the excellence of athletic performance would fade because we would come to admire the inventor and not the athlete themselves. However, between these two contrasting positions, a consensus may emerge. First, even advocates against doping admit that the spirit of sport criterion is somewhat of an 'elusive concept'.<sup>253</sup> Secondly, most theorists also appear to agree that the extent of regulation should correlate with the nature of the sport — a theme already explored in Sections 1.3 and 2.1, which argued for different considerations to apply inter-sports (as between physical and mind sports) and intra-sports (as between and within different mind sports).

In light of this, the author suggests and supports the following reforms:

- (a) That athletes' health be given priority and the spirit of sport be specifically defined and eventually phased out as a fundamental rationale;
- (b) That there be a shift in focus away from the spirit of sport criterion and towards the enhancement criterion which should be *outcome*-based; and
- (c) That there occur decentralisation of governance away from WADA to sporting governing bodies best placed to appreciate the values and nature of the sport, such that any future regulations can reflect the nuances of that particular sport.

### 3.1 Spirit of Sport

Regarding the spirit of sport reform, various suggestions have been hitherto proffered. For example, Henne et al.<sup>254</sup> argue that the concept should be

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<sup>251</sup> *ibid* 670.

<sup>252</sup> Sandel (n 85).

<sup>253</sup> Stephen Moston, 'The Spirit of Sport?' (2013) 2 *Performance Enhancement & Health*.

<sup>254</sup> Kathryn Henne, Benjamin Koh and Vanessa McDermott, 'Coherence Of Drug Policy In Sports: Illicit Inclusions And Illegal Inconsistencies' (2022) 48-55.



abandoned entirely, and focus should instead be on health and performance enhancement. Taking a less controversial approach, Loland and McNamee argue that the spirit of sport concept should be reformulated through finding an ‘overlapping consensus among all WADA stakeholders’.<sup>255</sup> They offer a reformulated understanding of the concept, one that focuses on the ‘integrity of sporting competition’ whilst balancing the need for athlete protection. Diverse though these views are, they appear to have one common denominator: the health of the athlete.

The preferred approach that this article offers is to incorporate or reshape the ‘spirit of sport’ into a health-centred concept. As Savulescu et al. suggest, prioritising the welfare of the athlete is the primary concern<sup>256</sup> — *if* the health of an athlete is at risk, *none* of the fundamental underlying principles of hard work, authenticity and fairness, even if shown to be sound, would really matter. The reality is that WADA’s regulations over the last 20 years have largely failed to prevent systematic abuse and widespread drug use in sports and, in fact, its strict insistence on a deontological approach can paradoxically lead to proliferation of black markets where ‘the safety of the product is questionable’,<sup>257</sup> worsening the health of athletes. Savulescu et al. raise an analogy between the prohibition of doping and that of the prohibition of alcohol in America which, rather than reducing drinking, increased the volume of alcohol consumption.<sup>258</sup> The same logic is applicable here: despite WADA’s strict, duty-based and over-inclusive form of regulation, empirical evidence has shown that the demand for enhancement by athletes has not decreased. The emphasis placed on health is not to suggest that WADA should take a completely hands-off approach and allow all enhancing substances/methods; rather, a more measured and considered approach that places health at the centre should be adopted. This would include conducting risk analyses on substances/methods which are heavily abused but have insignificant adverse effects and allowing their use within the parameters of health, or an implementation of a threshold system which would allow for some degree of intake/intervention provided the line is not crossed and the athlete’s health is not compromised.

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<sup>255</sup> Loland and McNamee (n 73) 325.

<sup>256</sup> Savulescu, Foddy and Clayton (n 89) 670.

<sup>257</sup> *Ibid* 669.

<sup>258</sup> *ibid* 670.

In other words, a reformulation of the spirit of sport to a health-centred concept would also mean that the discourse is driven by science. By focusing on methods/substances that *actually* enhance (see below), this would encourage greater scrutiny by scientists and experts and generate a more transparent and open system. In this manner, defining ‘doping’ would be brought back to the centre-stage with the result that the discourse has become more focused and less subjective.<sup>259</sup>

Regardless of how the conception of health would be incorporated into a newly reformed understanding of the spirit of sport, WADA must alleviate the burden it places on the interpretation of the spirit of sport. This should be achieved over time and not in one sweeping change that uproots what has, until now, been the entire basis of regulation. A more effective course of action is for the spirit of sport both as a criterion and a concept to fade away *gradually* to become an ideal and an aspiration, much like the spirit of Olympism, rather than being relied on for regulatory purposes. As part of this ‘phasing-out’, the emphasis of regulation should be shifted to the enhancement criterion — the second suggestion to which we shall now turn.

### 3.2 Enhancement Criterion

At its core, what this proposal does is suggest a shift in attitude of WADA from the policing of behaviour or enforcing the duty of athletes not to dope to one based on the *actual outcome* or *actual enhancement*. In other words, a shift to a results-based system is proposed, where the burden would be a proof of enhancement, not the presumption of it.

Substantively, this would mean removing the words ‘has the *potential* to enhance’ from Article 4.3.1.1 so that it reads:

‘... with other substances or methods, ~~has the potential to enhance~~  
*or enhances sport performance*’;

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<sup>259</sup> See also de Hon (n 49) 672.

and further removing the words ‘or potential’ from 4.3.1.2 so that it reads:

*‘that the use of the substance or method represents an actual  
~~potential~~ health risk to the athlete’.*

In this manner, the enhancement criterion would only ban substances and techniques that *actually enhance* or improve performance in a measurable manner. This would be emblematic of a shift in thinking towards a consequence-based framework that places emphasis on the practical realities of doping, such as recognising that cognitive enhancement via tDCS is unlikely to make a difference between winning and losing in the context of chess. It might be argued that this would fail to capture those ‘ill-intending’ athletes who attempt to gain an advantage through doping but turn out unsuccessful in enhancing their performance. Two responses are offered here. First, an attempt to cheat is, of course, potential evidence of the duplicitous intent of the athlete. However, where this attempt *fails*, it is not only difficult to prove there *was* an attempt, but it is also even more difficult to prove the presence of intent. Attempting to decipher intention in every situation is costly, time-consuming and speculative. Secondly, it is arguably not much of a problem if these athletes remain unpunished. If WADA is truly concerned about clean sports and ‘playing true’, then, surely, an athlete who gains no advantage, despite their intention to, does not affect competition in any way. If such an athlete does gain *actual* (the meaning of which is explained below) enhancement, it would not be too late to administer punishment. The remaining issue with this shift is that the current definition stipulated by WADA’s enhancement criteria, as it stands, is insufficient: it does not give guidance as to *how much*<sup>260</sup> or *what type* of enhancement is ‘too much’. For this, we turn to the argument in favour of decentralisation.

### 3.3 Decentralisation

It is proposed that any future change in WADA regulation should be attuned to the fact that different sports entail different qualities and that ‘each sport [should] determine its own rules’ and ‘whether neuro-doping poses a risk

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<sup>260</sup> Except with respect to 4 exceptions in Category S3 in PLIS.

to its ethos.<sup>261</sup> In this light, what is meant by *actual* enhancement may differ from one sport to another. This article does not advocate that athletes be tested on an individual level for potential enhanced performance but instead regulation should, as far as possible, give power to individual sporting bodies themselves to determine whether a substance or technique violates the ‘spirit’ of a particular sport and hence *actually* enhances in that specific context. For example, it may be that FIDE ultimately decides that tDCS should not be banned in chess because of a lack of evidence of actual enhancement in chess performance, and that it does not violate the spirit and values of chess. On the other hand, the World Athletics may decide, taking into account similar considerations, that, on balance, tDCS does enhance and violate the spirit of long-distance running and therefore institute a ban. Further nuances may be added to this argument, such as allowing these sporting bodies to determine the degree of enhancement allowed, or to limit the ban to certain categories, such as, for example, only banning tDCS for track races above 1500m. This approach would not only free up WADA’s resources but allow for a more measured policy that truly reflects ‘respect for self and other participants’<sup>262</sup> and the physical/cognitive divide.

This argument for decentralisation is evidently not without its flaws. Issues of individual sports bodies’ funding, resources and accountability may arise — having a centralised arbiter, WADA, reduces the chances of a conflict or inconsistencies between individual sporting bodies, and helps (at least ostensibly) retain impartiality. Nevertheless, it is conceivable that WADA could still play a similar role of ultimate oversight in this decentralised model, albeit with greater delegation powers to individual sporting bodies such as the World Athletics and FIDE. Further, this arrangement could help alleviate WADA’s legitimacy problems. Devolving decisions in order to show more realism and consistency could serve to boost WADA’s approval amongst separate sporting federations and indeed amongst professional athletes.

A further argument against this model is that it could potentially run into problems with inconsistencies. For example, caffeine may become a banned substance in chess, but not in long-distance running, which may become confusing for spectators and athletes alike. Despite this, a tailored model would allow more room for just results and would solve the fundamental issues of

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<sup>261</sup> Davis (n 13) 651.

<sup>262</sup> WADC (n 45).

acceptable enhancement and the lack of a universally understood concept of the ostensible spirit of sport. Such a tailored approach could also prevent recurrence of the Raducan-type controversy, as the gymnastics governing body would have regard, unlike WADA, to the acceptability of the common cold pill *in the context of gymnastics as a sport (and its core values)* and specifically to *how* and *to what extent* it had aided, if at all, Raducan's ability to perform complicated somersaults with such accomplished grace and precision. Moreover, the advantage of decentralisation lies in reaction time. When a new technique, such as tDCS, emerges or when a scientific advancement reveals fresh findings, sporting bodies can engage with analysis of the risks associated with a *particular sport* in the context of the particular nature of that sport, its core values and the degree of impact on those values.

In terms of implementation, any such proposal would, of course, require consent and active agreement amongst all stakeholders, including IOC, governments, individual sporting bodies and athletes. It is difficult to say for certain whether such a model would be welcomed with open arms by all parties, especially given the complicated political interplay between IOC, WADA and national governments. Nevertheless, it is argued that this model would work best in the age of emerging NIBS technologies such as tDCS, which have the potential to enhance both physical and mind sports performance in both cognitive and physical aspects — a lacuna which WADA can no longer afford to neglect.

## CONCLUSION

This article has argued, through the prism of chess and tDCS, that WADA's anti-doping regulations, in particular the enhancement criterion, are unclear and over-inclusive, yet the concept of cognitive enhancement is underexplored, and that, further, the fundamental principles underlying these regulations, particularly that of the spirit of sport, are themselves intrinsically flawed. Emerging NIBS technologies such as tDCS highlight loopholes in the current anti-doping regime that fails to pay regard to the existence of the physical and mental divide, the nature of cognitive enhancement and the nature of each sport and its core values. Finally, recommendations in favour of a shift to a decentralised, consequence-based regulatory framework combined with a reformulated conception of the spirit of sport are offered, specifically, the

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reformulations of Articles 4.3.1.1 and 4.3.1.2 of WADC so as to require *actual* enhancement rather than *potential* enhancement. It is proposed that such a devolved regime would relegate more power to individual sporting bodies. In such a manner, athletes in both the mental and physical sporting realms could genuinely be regarded to ‘play true’.