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Alcohol-related Visual Attention Disorders on Hand-Eye Coordination Failure in Basketball Players

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Abstract

This study evidences that the alcoholic drink does not allow an appropriate selection of stimuli in the player. It was consumed by male college basketball players. The result demonstrated relevant variability on the AUDIT-10 between heavy drinkers and at-risk drinkers. Overall, the HVOT scores show a great failure rate in the task of assembling fragmented and disorganized figures. The results show a visuospatial deficit in trained athletes. The failure of the estimating score on the shooting task while running, among heavy drinkers, is 66.66% with "left eye open", and 13.33% with "right eye open". The deleterious effects of alcohol are of the order of 3.3% "right eye open" and 66.6% "left eye open" in high-risk drinkers. Among high-risk drinkers, failure scores are estimated at 54.54% with "right eye open", 72.72% with "left eye open". The attraction between basket and "right eye open" is 49.9%, and it is 6% with "left eye open". But other psychopathological disorders would coexist with those of visual attention.

Keywords

alcoholemia, clinical consultation, neurocognitive degradation, hand sport shooting, depressed mood, visual disturbance, sports psychopathology

1. Introduction

A study conducted in Congo-Brazzaville revealed that young adolescents were directly affected by alcohol consumption (Mabiala-Babela et al., 2005). Today, this observation has remained unchanged in this social environment (Kimbally Kaky & Coll, 2011; Tsiama et al., 2021). On a daily basis, the gatherings of young people are essentially a decisive opportunity for the consumption of alcoholic beverages, both during the school learning period and on the eve of sports competitions (Tsiama & Bakembo, 2022). A complicit desire is to perpetuate these kinds of libertine-style behaviors (Houdard, 2001), which clearly seems to be at stake based on the recommendations of the public authorities, particularly the authorities in charge of school and university administration. Although libertine passions have the function of diverting the philosophical tradition of reason (McKenna, 2000) among young people, this libertinage would be driven by administrative compromises, authorizing the establishment of centers for the sale of alcoholic beverages within the confines of establishments dedicated to apprenticeship and training of young people. And, in this configuration, sports training and training institutions in the sciences and techniques of physical and sports activities are not spared (Tsiama et al., 2021; Tsiama & Bakembo, 2022). If licentiousness is as close as possible to sensations, it unfortunately has the dark side, that of control (Darchis, 2011). Common sense refers us to the influence of the mind and its procession of cognitive resources. If this is the case, is it not enough to see in the alcohol consumed, the sign showing the reason for the decline in the cognitive performance of athletes? Do we not admit that alcohol, operating from the soma, is the predator of the psychological capacities of sportive elites to be?

1.1 Utility of Visual Cues for the Basketball Shooting Task

Basically, psychological factors are a key element to perform in group sport, the two for the technical and tactical aspects (Décamps, 2012) and for the physical and biomechanical components (Reiss & Prévost, 2013). Playing these sports frequently requires performing at least two skills such as carrying the ball while visually searching teammates for a pass (Furley et al., 2010). One of the biomechanical components sought is the coordination of the upper and lower limbs (Penner, 2021). In basketball, for example, shooting accuracy is one of the important technical aspects because it strongly determines the outcome of a match (Boddington et al., 2019; Padulo et al., 2018; Angel Gomez et al., 2008; Erculj & Supej, 2006). In this case, it is essential to comprehend the process of visual attention for better fulfilling a performing sporting task (Furley et al., 2010). But little information is provided regarding skills in the shooting task (Padulo et al., 2015a; Ardigo et al., 2018). This information scarcity generates a diversity of learning scenarios tending towards the development of shooting skills. Some players face uncertainty about the trajectory the ball would take after taking a shot, whether it's a jump shot, a long shot, or a long shot. mid-distance (Okazaki & Rodaki, 2012; Amaro et al., 2022). Regardless of the type of shot, it is common to have the ball travel an awkward trajectory towards the set point thanks to the player's visual cues. Such clumsiness is most often wrongly attributed to the sole

role of the upper limbs or the “hand” without taking into account the shot or the “eye”. Otherwise, the coordination system of the information received through the eye would allow the player to be able to control, guide and direct his hand in the correct accomplishment of the assigned task (AziFaizRidlo, 2015; Candra, 2020). But, during the contributory process of the eye, it only sometimes offers tumultuous visual images, suggesting a quality of sight that is extremely suspicious of teammates who are nevertheless involved to not making mistakes without any justification. The repetitions of this behavior on the sports field show, ipso facto, the central nervous system of the player in reference to the processing of the information received by his eyes. The expression of this abundance of errors with eyes open, worries all sports players, to the point where no one would dispute the presence of a visual attention disorder.

1.2 Neurophysiological Description of Visual Pathways

With regard to poor performance, the eye would, undoubtably, be at the top of the list among the accused since it would bear the responsibility of producing an accommodative effort, in view of what it can bring the image closer to the target. On the retina at the cost of significant cognitive effort (Bursztyn, 2016). Neuropsychology tells us that vision results from the transformation of light energy into electrical impulses. And that, this operation is carried out by the pigmented photoreceptor sensory cells of the retina, in particular by the cones and the rods, whose activity is relayed under the effect of light, to the bipolar cells. Cones determine visual acuity and color vision; the rods allow peripheral and night vision. The bipolar cells activate the retinal neurons or rather the ganglion cells whose extensions form the optic nerve. These visual pathways project to the visual cortex, but also to other brain structures, controlling gaze fixation and triggering the photomotor reflex; the superior quadrigeminal tubercles, directing the gaze according to external stimuli; the oculomotor nuclei of the brainstem, governing eye movements towards a target (Seron & Van der Linden, 2014).

Taking into account the function that the eye would play in the context of a shot at the basket, whether perceptual or motor, this organ of sense would constitute a royal road to approach, on the one hand, the basic mechanisms of executive functions. And, on the other hand, their dysfunction (Marendaz et al., 2007). In some sports, “hand-eye” coordination is essential to validate a throw, a strike or a shot with the appropriate device. To do this, the mobilization of visual attention is essential to succeed in the task, not only through an adequate hit of the object but above all a good understanding of its future trajectory when it would have left the player’s hand.

1.3 Emotional Effects on Visual Field Disturbance in the Player

In addition, the neuropsychological view point reports a possible deficit in visual selective attention, when it is vulnerable to the sensitivity of second or not very useful objects current in the vast visual terrain. Unable to escape interference, the observers do not fail to trigger a crisis of disappointment in the face of poor performance at the cost effort missed shots when the ball takes a deflection to get lost where it was not yet expected. These imperious behaviors sometimes arise in a sometimes intense

emotional context during which the player goes through a craving or is immersed in an unprecedented alcoholic presence, a consumption that would have happened a few minutes before the competition (Tsiama & Bakembo, 2022). This state goes so far as to trigger the intermittent explosive disorder with his aggressive temper tantrums and helps him anticipate other bad behaviors. The impossibility of better managing the explosive emotional expression tips the athlete into a perceptual confusion that could prove scandalous for the team. Otherwise, the poor visual perception could cause visual attention disorders to drift from its significant base to embed it within a series of confusions of faces and trajectories on the sports terrain. Since the visual perception is underpinned by an exploratory activity of the gaze traversing the landscape according to a strategy making it possible to locate the most important details. In such circumstances, however, it is clear that disturbances in the athlete's own visual perception can negatively influence visual selective attention. Attention involves both orientation and mental concentration towards a task as well as inhibition of competitive activities (Gil & Wager, 2021), in a single attentional field.

1.4 Contribution of the Environment to the Attentional Field of the Perceptual Apparatus

An attentional field corresponds, in fact, to the interior space, from which the subject mobilizes his attention, that is to say the space where information has the best chance of being processed in a minimum time. The fact that this processing is not limited to information but to a large quantity is the sufficient condition to appreciate the capacity of the central nervous system to succeed in this fully complex cognitive activity (Bertoz, 2009). Somehow, some contemporary authors claim that our information processing system seems to be limited in attentional capacity. Since this capacity corresponds to the quantity of information of external or internal origin, that a person can be able to process in order to carry out an action correctly. Technically, the amount of information coming from the environment or our body is always greater than the processing capacity of our brain. This limitation makes it necessary to make a selection with regard to the abundance of information presented to the perceptual apparatus.

1.5 Convergence of Attentional Theories on Specialized Memories

Attention is an object of cross-study, both by cognitive psychology (Barbot, 2006), cognitive neurosciences (Michael, 2012; Appourchaux, 2013) and by neuropsychology (Lechevalier et al., 2008). This is because attention is a function of the information processing system that makes it possible to manage an appalling abundance of information (Lemaire, 2006; Target, 2016). Despite the complexity of this cognitive function, supporters of these various sciences are unanimous in thinking that it provides the bridge between sensory memory and working memory. The activity of sensory memory begins with the thousands of stimuli that constantly reach us, and that the brain renders highly relevant and coherent (Mazo-Darné, 2006). Without ever arriving at the slightest confusion of cognitive management, it is however essential to understand that our whole body is only memory, with regard to its sensitive and sensory faculties. Since the whole of our external world is perceptible to us through

our five senses, each containing within it, sensory receptors with extraordinary performance to be able to capture and convey specific information.

When sensory activity kicks in, the brain constructs internal experiences that it is supposed to remind us of at the slightest activation. During this process, the best-known sensory memory, being the so-called “iconic” visual memory, remains increasingly solicited, which makes it fleeting, while it serves as an entry into other specialized memories (Lieury, 2005). Passing through sight, 80% of information is imposed on us in the course of a day (Rosi, 2005). Moreover, several experiments have shown evidence of short durations for all sensory memories. Indeed, visual sensory memory lasts about a quarter of a second. According to Croisile (2009), the traces of sensory memories are short, ranging from 300 to 500 milliseconds for visual sensory memory (iconic memory), 2 to 3 for auditory sensory memory (echoic memory).

Afterwards, the relevant information is routed to the working memory whose maximum retention time for cognitive material is of the order of 30 seconds, to which are added a limited capacity and sensitivity to interference (Lémaire, 2006; Croisile, 2009). On the other hand, the central administrator in MDT would be more exposed to endogenous factors namely anxiety, depression, stress, emotional exhaustion, and to exogenous factors such as alcohol and drugs. These would trigger a disorderly expenditure of the person’s attentional resources. WM is also vulnerable to anxiety and depressive disorders, the major drawback of which is the positioning of biases (Barlow & Durand, 2016). Attentional bias is defined as the propensity of a subject to direct their attention to one stimulus rather than another because of these perceptual characteristics.

1.6 Drawbacks of Stimulants and Anxiety on Sports Attention

In the scientific literature, patients with attentional biases are invaded by generalized anxiety disorders. However, some authors have proposed that persons with generalized anxiety disorder have an attentional bias that favors the processing of threatening stimuli (Beker et al., 2001). Other studies have discovered the presence of increased distractibility in people with anxiety disorders using various tasks, both auditory and visual. These studies were mainly conducted with sub-clinical populations, i.e. subjects with a strong tendency to worry or anxiety. Distractibility is defined as the difficulty in ignoring stimuli that are irrelevant to a task (Mialet, 2000). In addition, in the sportive population, anxiety is combined with a feeling of loss of skills or early defeat vis-à-vis verbal threats from the opposing camp. In the pre-competitive phase, a behavior would predispose athletes to seek psychotropic drugs in order to minimize the negative emotions driven by contextual factors (Tsiama & Bakembo, 2022). The psychotropic is described as a natural or synthetic substance whose action on the central nervous system is capable of modifying the mental activity and conduct of a subject (Sillamy, 2001). Psychic disruptors, including intoxicating substances such as ether and alcohol, would be the group of psychotropic drugs most valued by average level athletes, ahead of the sedatives and stimulants most often reserved for Olympic or world level athletes (Cox, 2013).

Attention is also recognized as the potential reservoir of cognitive energy and is characterized by many functions: selective attention; divided attention; attentional switching; concentration; preparatory attention (Lémaire & Bherer, 2005). Despite this abundance of functions that it is supposed to play, it looks more or less limited taking into account the categories it faces. It is a process that makes one chooses the most relevant signals for the current action, giving access to the inhibitory function of attention, which results in the phenomenon of selective ignorance. Paying attention to one thing or event is just one way of automatically ignoring others. This hypothesis is better supported by the different categories of attention (Poissant, 2003; Ben Azouz et al., 2009).

1.7 Neurotoxicity of Alcohol on Cognitive Performance

According to the cognitive approach, a coherent decision taken rapidly allows the athlete to be capable of anticipating with assurance so that it produces an efficient action within the required time. Moreover, an athlete with a normal cognitive status would pose few behavioral problems towards the sports trainer (Tsiama et al., 2019) than towards the expert in charge of the latter's mental preparation, as well as towards elite sports fans. Despite the effects of context in a competitive situation, it would undoubtedly make fewer errors of representativeness. In fact, the more the athlete feels that he is not making mistakes when he actually does, the more the team suffers. Obviously, we may be tempted to think that athletes who are cognitively abnormal or carried away by alcoholic neurotoxicity (Pierucci-Lagha & Derousné, 2003) are inhabited by biases of over-confidence or even by biases of under-confidence (Lemaire, 2006). The first biases assume that they tend to underestimate their cognitive performance while the second refer to have a lower level of self-confidence than their cognitive performance (Tsiama & Bakembo, 2022).

1.8 Involvement of Neurons in the Visual Response

The neurophysiological approach to attention makes an enlightening contribution which essentially boils down to cerebral localizations and tries to present some details concerning the functioning of that person. It is thanks to the progress of this science that it is for example possible for us to know that the increase in attention is accompanied by an amplification of the visual response and the intensity of the response to a stimulus, to which a visual neuron, responsible for varying the level of attention, is sensitive. In the ventral system, which scrutinizes the shape of objects, the milieu and living beings, the receptive fields of neurons in the inferotemporal cortex gather around a visual target. Directing attention to a point in space increases the sensitivity of neurons in the parietal cortex to signals from the space surrounding the target, in the inferotemporal cortex, the sensitivity of neurons to the point of the target is increased (Bertoz, 2009).

2. Method

2.1 Attendees

The participants were 37 students practicing male basketball (Age: M=22.04±2.67 years, SD=1.39) of

which 14 are in first year (beginners) and 23 in third year of sports bachelor degree, basketball option (trained people) at Marien Ngouabi University. Beginners have no previous experience and are on day 7 of their mandatory basketball training. Among the persons trained, nineteen (19) of them each have a membership in one of the clubs affiliated with the departmental basketball league (experience in training: M=3.74±0.89 years; SD=0.03). The other four (04) were all university-level basketball players at the time of the study, and have performed at the school level in the past, having represented their home school in inter-school competitions at the departmental level. All participants reported normal visual acuity and frequent use of the right hand. They had recognized a high frequency in the intake of alcohol on a daily basis, even during the competitive period, and evidenced no history of neurological disorders. The diagnosis of alcoholemia is made by a doctor from a private clinic and then by an assessment based on the DSM-VI at the Sports Psychology laboratory. Before participating in the study, the people gave their written informed consent in accordance with the Declaration of Helsinki and were approved by the scientific research committee of the Higher Institute of Physical Education and Sports of Marien Ngouabi University.

2.2 Procedure

Before starting the clinical measurements and evaluations related to the study, we contacted 40 participants by verbal communication, during the learning of basketball at the Higher Institute of Physical Education and Sport. Students who did not drink alcohol were not taken into account. Eligibility of interested participants depended on the estimated amount of alcoholic beverages ingested. Only those with a minimum of 12 weekly drinks were selected. The randomly obtained answers opened up the opportunity to manipulate the “AUDIT-10” test. Beyond that, since alcohol is a product likely to cause cognitive damage, we decided to work only with persons with normal cognitive performance. To ascertain this state of affairs, a psychometric test examining the cognitive and neuropsychological aspects was administered, in particular the HVOT. This psychometric test made it possible to select people not affected by a deviation in visual attention. Those persons should attest to their normal neurocognitive status through lower scores. Curiously, three (03) subjects were withdrawn for presenting high scores, indicating cognitive impairment. Finally, hand-eye coordination is assessed by the shooting test. The field test “shooting-test” derived from the notification of the visual scene in terms of success or failure while the psychometric tests “AUDIT-10 and HVOT” required the correction of the proofs according to the standard instructions.

2.3 Psychological Investigations

2.3.1 Alcohol Use Disorders Identification Test

The Alcohol Use Disorders Identification Test (AUDIT-10) is a questionnaire developed under the aegis of the World Health Organization (WHO) and analyzing alcohol consumption over the past twelve months from ten questions. It is the most largely used instrument internationally and is particularly suitable for young people. Its French version (Gache et al., 2005) was administered in

writing to the participants. Based on the responses to this test, a score of 0 to 40 is calculated to classify young people according to different levels of risk determined by thresholds. Although the problem of the threshold is recurrent in the scientific literature according to age, sex and culture, we used the international thresholds proposed by the WHO, differentiated according to sex for the risk of dependence (13 and more for men; 12 and more for women) as for abuse (8 to 12 for men, 7 to 11 for women). Furthermore, we distinguish risky drinkers from problem-free drinkers and non-drinkers, totaling four classes of drinking patterns (Sauders, 1983).

2.3.2 Hooper Visual Organization

Test The Hooper visual organization test (HVOT) was retained as a specific test of visual integration. It is focusec instrument developed by Helston E. Hooper in 1958 then reissued in 1983 (Pena et al., 2008). It is based on image recognition and identification from the task of rearranging figures that have been fragmented and disorganized. Its transfer is susceptible to neurological disorders, including cognitive impairment and brain damage (Greve et al., 2000; Lopez et al., 2003) of people over an administration time of approximately 15 min. Ratings, between 0.5 and 1 point, are assigned to the 30 drawings in small lines, representing objects cut into pieces placed on a stimulus card of 100 cm2. This test makes it possible to obtain a raw score by adding up the different points allocated to each of the successful images. The score varies between 0 and 30. A score of 0 to 20 points corresponds to a visual-spatial deficit. More than 21 points indicate the need for further neuropsychological evaluation (Boyd, 1981).

2.3.3 Shooting test

This is a test designed by our laboratory, which is inspired by the theoretical models developed by Reiss and Prévost (2013) on “evaluation of physical qualities”. This test aims at improving the coordination of the upper limbs, the gestural frequency of dribbling and the precision of the shot in a stable visual field. The athlete is invited to exploit only one possibility available to him: Shooting while running. After a starting signal, the carrier of the ball travels 30 m while being visually attentive to the studs delimiting the route as well as to a red mark on the ground, indicating the end of the route. Thus, from this point colored in red, the athlete is invited to perform a shot on a mobile wall (plank) placed over a horizontal distance of 4m, and 3m high. The ball fired should end up in a small square with a side of 30 cm. Two conditions taken into account: In the first condition, the sportsman keeps his “right eye open” and uses his free hand as an eye patch for the left eye. Then, the latter puts a ball in motion by dribbling with one free hand, on a straight trajectory and then ending his race with a shot at the wall. The examiner notes the success rate with the right eye. In the second condition, the sportsman with his “left eye open” by placing the right eye under the right hand like an eye patch, then performs his dribbles with the free hand on a straight trajectory which also ends with a shot at the wall. The examiner notes the success rate with the left eye.

2.4 Statistical Analyzes

Data was analyzed using SPSS 19.0 for Windows. Descriptive statistics comprising; the mean and

standard deviation, for continuous variables, were generated and compared with the independent groups using Student's t-test. The level of significance was set at 0.05. To compare the subgroups according to the qualitative variables, the relevance level was set at 0.05. Person's chi-square test was used.

3. Result

Table 1 provides the results of the t-tests on the average scores of alcohol consumers obtained on the AUDIT-10, between people trained in basketball and beginners in this sport. In the heavy drinking category, trained basketball players seem to be more exposed to alcohol than novices ($p < .05$). The difference in high-risk consumers gives a more popular behavior in trained subjects than in novices ($p < .05$).

Table 1. Classification of Basketball Players by Category of Alcohol Consumers

AUDIT-10	Beginners (n=14)	Trained (n=23)	t	*p*
Abusive consumers	n=5 8.6±0.26	n=10 10.2±0.13*	-2.57	< *.05*
Consumers at risk	n=9 21.44±5.63	n=13 27.92±3.9*	-2.09	< *.05*

***** Significant result at p < .05

Table 2 shows that the scores of the cognitive dimension are not considered to be alike between those of novices and trained ones. The results of the descriptive statistics and the t test are significantly different at the HVOT ($p < .05$). However, beginners would be more likely to succeed compared to people with strong basketball practice experience. On the other hand, the HVOT scores demonstrated a significant difference, suggesting that the set of results confirms the hypothesis of a probability of visuospatial deficit in almost all participants (mean scores less than 20). This seems to indicate a difficulty in recognizing and identifying the images with the two consumer profiles. Overall, there is an important difference between the basketball players, both for the "success of visual integration" ($p < .05$) and for the "non-success of it" ($p < .05$). The errors observed with the HVOT (Table 2) are nevertheless errors of the spatial type, at least transiently, apparently analogous to those of ophthalmological pathologies whose damage affects the transparent media of the eye and the retina.

Table 2. Number of Passed and Failed Hooper Test Frames for Basketball Players

HVOT	Beginners (n=14)			Trained (n=23)				
	Min	Max	M±SD	Min	Max	M±SD	t	*P*
Successful	9	25	16.36±2.03*	4	24	10.91±1.24	3.01	< *.05*
not passed	5	21	12.21±2.24	6	26	18.22±1.36*	-3.16	< *.05*

* Significant result at p < .05

In the first condition “right eye open”, the Chi-square statistic is 8.59 (Table 3). The result is relevant at $p < 0.05$ (there is a statistically significant link between the open right eye and the fact of making successful shots at the basket). In condition 2 “left eye open”, the Chi-square statistic with Yates’ correction is 0.0009. The result is non-significant at $p < 0.05$ (there is no statistically important link between the left eye open and the fact of making successful shots at the basket). In view of the high failure rate for the second condition, it is likely to suspect the presence of pathologies that would be linked to the “left eye-hand” coordination deficit.

Table 3. Shooting Test Success Rate in Relation to Hand-eye Coordination

Au Shooting test	N	Condition 1 Right Eye Open		Condition 2 Left Eye Open	
		FR	SR	FR	SR
Consumers with abuse	15	13 (86.67%)	02 (13.33%)	05 (33.33%)	10 (66.66%)
Consumers at risk	22	07 (31.82%)	12 (54.54%)	06 (27.27%)	16 (72.72%)
Ch2	8.59			0.000	
P	*< .05*			*N.S*	

Table 4 evidences that success in shots with one right eye open (58.8%) is an obvious skill performance among basketball players who are used to consuming alcohol but very unremarkable among high-risk drinkers (36.8%). This is more visible in those who abuse. In addition, the failure rates obtained in shots serve as a benchmark, since the poor performance in shots at basket is obvious for consumers at risk (63.1%). Dexterity being a motor skill, may however depend on the prevalence of the right eye in an athlete who is used to consuming alcohol excessively. This finding seems to reflect the need for visual lateral dominance during a basket shot. But with regard to the first condition, it should be said that there is a real attraction (49.9%) between the success of a shot for a basket and the fact of having an open right eye. Besides in the second condition, more than 30% of basketball players succeed in

their shots at the basket, but the proportion is higher for basketball players with alcohol abuse consumption (33.3%) than those with a high-risk drinking profile (27.3%). There is therefore a low attraction (6%) between the success of a shot for a basket and the fact of having an open left eye. In essence, basketball players with the status of at-risk alcohol consumers would be victims of strong opposition on visual laterality, which seems to result in hand-eye coordination errors.

Table 4. Percentage of Attractiveness between Alcohol Consumers and Shooting Performance

	Condition 1 Right Eye Open		Condition 2 Left Eye Open	
	FR	SR	FR	SR
Consumers with abuse	86.7 (+)	13.3 (-)	33.3 (+)	66.6 (-)
Consumers at risk	36.8 (-)	63.1 (+)	27.3 (-)	72.7 (+)
Average percentage	58.8	41.2	29.7	70.3

4. Discussion

The relevant difference in the means between the AUDIT-10 scores (Table 1) by profile of drinker gives: “consumers with abuse” (t=-2.97; $p<.05$); “consumers at risk” (t=-2.09; $p <. 05$). The hypothesis of cognitive stimulation with alcohol is significantly different between the two groups of subjects (novices, trained) during sports tasks is validated. Furthermore, the register of results indicates a significant difference in the means between the HVOT scores (Table 2): “passed” (t=3.01; $p<.05$); “did not succeed” (t=-3.16; $p<.05$). The hypothesis of a differentiated reaction to cognitive stimulation with alcohol between the two groups (novices, trained) is validated.

Participants in the AUDIT-10 test have an average difference in scores, between beginners and trained, with regard to heavy drinkers and at-risk drinkers (Table 1). The comparisons of means (Student’s t test) show that trainees are faster than novices in choosing the wrong stimuli for the task of gathering scattered visual material. Whereas, for the same task begnners, be act faster to correctly select visual stimuli than trained ones (Table 2). These first data explore the effect of alcohol on visual selective attention (Table 3) in a small population of athletes practicing inter-individual sports. Indeed, the existence of remarkable differences according to tests is a new result, even if some previous studies, carried out with other instruments and in larger sports populations, had been able to suggest the same tendencies. On average, the subjects delivered more than 90% of successful shots with the right eye open and more than 60% with the left eye open (Table 3). However, the success of the shots was probably obtained more with difficulty among basketball players with the profile of high-risk drinkers (Table 4). Although the comparison of the means during the HVOT visual scanning sequence indicates significantly different scores (Table 2), other parameters seem to influence the failure rates in novices and the success rates in trained people with regard to the interaction with the psychocognitive and

neuropsychological factors of alcohol. Since the Student's t comparisons of means were all found to be significant at $p < .05$.

Trained basketball players are more clumsy at shooting the ball than beggins (Table 2). These results corroborate those obtained in the AUDIT-10 for which trained basketball players would be categorized as risk consumers compared to novices (Table 1). However, participants in the AUDIT-10 test have a significant mean difference in scores, between novices and trained subjects, with regard to heavy drinkers and at-risk drinkers. The Chi-square statistical test shows significantly different rates between failed shots and successful shots with the right eye open (X^2=8.57, $p < .05$). On the other hand, the Chi-square carried out on the outcome of the shots with the left eye open offers opposite results between failure and success rates (X^2=.000; N.S). Condition 2 "left eye open" has a lower level of attractiveness (6%) compared to condition 1 "right eye open". The miss rates for shots with the right eye open (13.3%) and with the left eye open (66.6%) seem to confirm the devastating effects of alcohol in the brain.

Among the demonstration, we note more specifically the deleterious effect of alcohol on visual attention disorders, with the lengthening of reaction time and an important drop in gesture precision in a sporting task. Our conclusions would be close to those observed in some previous studies. In particular on cognitive and neurobehavioral disorders with their corollary namely reduction in visual acuity, alteration of reflexes, deterioration of psychocognitive functions conducted by Trivedi (2006). Then on cases of alcohol consumption, studies report that low blood alcohol levels between 0.25 and 0.5 g per liter of blood lead to relevant changes in psychotechnical and sensory tests. Consequently, a lengthening of reaction time, an increase in errors in response to visual and auditory stimuli and a narrowing of the peripheral visual field are observed. There is a progressive reduction in capacities in the drinker who is clumsy, slow and incapable of following the rhythms of the tactical combinations (Sancho-Garnier, 2007).

Alcohol, as a widespread social scourge in the sports population, traditionally affects young adolescents as well as young adults, with it the procession of symptoms of several psychological disorders in all social strata (Oscar-Berman & Marinković, 2007). The most alarming finding remains the impact of alcohol on the attention abilities of athletes, in agreement with studies having shown that adults suffering from alcohol abuse experienced severe anxiety in adolescence, the complications of which trigger late mood disorders (Albert et al., 2002).. Athletes display poor visual attention performance, depending on whether one is novice or trained, in the case where the athletes have drunk alcohol. These results are reversed from those obtained in previous studies on non-alcoholic sports populations in which the elites have strong visual abilities (Vella & Cameron-Smith, 2010; Ayaz Kanat & Simsek, 2021). In the case of attentional biases, these manifest themselves both in more occasional consumers known as "social drinkers" and in persons who drink large quantities of alcohol. Meanwhile, the attentional biases associated with alcohol are more developed in anxious and socially phobic subjects

(Deleuze et al., 2013).

Following the sensational self-perception of the respondents, we have the intimate conviction that alcohol appears early in youth in general, and asserts itself in the sports population as described more by authors summoned in this study. Our results rhyme with the affirmation of the relationship to alcohol consumption in society, which would be intrinsically linked to the question of mood or emotional experiences (Molitor et al., 2018). It is now necessary to emphasize that a cognitive-emotional dysfunction is appropriate and would not be linked to exclusively psychological factors. More often than not, athletes find a subtle combination of emotional and physical factors coexisting. In African sports culture, for example, the angst and anxiety of footballers remain despite the encouragement of the coach and supporters. Despite this positive motivation, Tsiama and Bakembo (2022) demonstrated that African athletes are prone to anxiety and adopt a permissive attitude on mythical beliefs. They still maintain the fear of defeat in front of another competitor despite the assurance of maraboutage. From then on, wondering if this miracle victory acclaimed by fetishes will happen, they observe, in addition to their doubt, rituals that they validate by consuming alcohol. This activity of increasing their excitement is just one way of courting spirits that can make them more than confident. The reactivity linked to their emotional instability leads us to suspect the characteristics of a problematic personality in our sports training.

Due to the drawbacks observed on alcohol dependence in relation to visual attentional performance during sporting situations, it is accepted that alcohol causes behavioral disorders of several types, including agitation. Taking this fact into account, it would seem that the clinical psychologist in charge of athletes finds himself confronted with two logics which question him about his usual practice. On whom and on what should it act (Franques et al., 2001)? There is an urgent need for psychologists, researchers and educators (Cox, 2013), to distance themselves from the social representations of the athlete, to favor the clinical approach (Moraguès, 2012; Palazzolo, 2012) or behavioral therapies and cognitive (Cottraux, 2001; Palazzolo, 2012). This vision invites them either to professional retraining or to a refocusing of the intervention processes. The fact of pleading in favor of clinical psychology or of wanting to fight against alcoholism, in no way gives the right to look for the solution in the niche of sports medicine, but rather to consider psychotherapy centered on cognitions in go as to act at the lowest level, that of craving, defined as the central expression of addiction (Auriacombe, 2018). Cognitive-type interventions would be beneficial in that they could influence the negative effects of alcohol addiction, in terms of its harmful effects on attentional performance.

One of the major theoretical propositions of selective attention argues that the essential distinction between them concerns the degree of analysis of the information to be ignored (Maquestiaux, 2017). For a basketball player, to pay attention to the trajectory of the ball among several players is to ignore certain realities of the sports scene. This is the phenomenon of selective ignorance. Selective ignorance is understood by many models proposed to explain the different forms of attention. One interpretation

suggests that there is a process of selective filtering with the removal of irrelevant information. Another interpretation proposes that there is no suppression of information, but liberation of the selected area from competition from other regions around, which are not necessarily suppressed. The process of visual attention therefore mobilizes the general processes of object discrimination in the visual field. On the other hand, the function attributed to attention is that of filtering information: it is selective attention, which chooses the most relevant signals for the action in progress. This filtering is also due to a completely surprising property of cerebral functioning. Indeed, while the brain can process a very large amount of information in parallel - this is one of the fundamental properties of vision - the frontal and prefrontal parts of the brain involved in the decision-making and arbitration mechanisms cannot process very little information simultaneously, often only one. This is the single channel theory. The single channel theory states that in reality only a very small number of objects are representable simultaneously, given our weak ability to process multiple pieces of information at the same time. During any visual scene, as well as during visual exploration, an attribute-based mechanism of attention (e.g., color or shape) sets the stage for focal attention, which itself provides orientation, towards the object of interest (Bertoz, 2009).

To argue for neuropsychological deficits, we note that attention modulates activity in the early stages of visual processing. When it does not just amplify visual input, it profoundly changes the very processing of data. Since it acts, depending on the context, on the spatial treatment of the physical elements present on the sports field, their attributes or a combination of the two (Bertoz, 2009). This hypothesis is in agreement with a number of deficits identified by the neuropsychological approach on the patient's attentional control (Bertoz, 2009). It argues that the nerve networks of the anterior frontal lobes, that control attention, are involved in mental concentration and they regulate the circuits going from the frontal sectors to the peripheral vegetative effectors, during cognitive activity (Collet et al., 2002).

Despite the fact that attention can be expressed at any point in the cortex, we admit that players have slight cortical lesions, since any cortical lesion inevitably disturbs the expression of attention. This argument espouses the conclusions of a serious research stipulating that attention disorders are an extremely frequent consequence of a brain lesion, whatever its nature (Couillet et al., 2001). If we are allowed to perceive a deficit, it would be due to the low speed of the shooting action, which would require an elegant and effective sight of the target. However, this deficit can be described as a difficulty in attentional selection, which could result in an inability to enhance target information, or activate an appropriate image in front of a new stimulus. This selection difficulty releases the automatisms that the basketball player is unable to inhibit. Players would also have difficulty performing anti-saccades, i.e. performing a saccade on the opposite side of a suddenly appearing target; they tend to shift their gaze in the direction of the target. This explains major difficulties in directing attention and gaze to a desired location. On the other hand, once the direction of gaze towards sudden information is unaffected, or

even increased, players therefore no longer manage to control their behavior, due to high distractibility. Because, external, non-useful information is expressed to distract the players.

It occurs that some athletes take alcoholic beverages mainly to motivate themselves or to do without early physical fatigue, which immediately exposes them to aggressiveness and violation of sports rules. However, with this extravagant behavior on the playground, these sports drinkers are ignorant in that they would present the characteristics of the persons who could be part of an episode of collective hysteria (Barlow & Durant, 2016). The perception of a collective hysteria emerges from the manifestation of the phenomenon of emotional contagion with the panic that some intend to conceal by alcoholic drink. When some drink because the members of the group do, then this desire and all the enthusiasm spreads to the whole team (Wang, 2006). Unfortunately, in the brain, the ethanol molecule would trigger neurological damage, comprising nutritional deficiencies typically linked to alcoholism. On the one hand, lesions in the parietal and frontal cortex lead to attention deficit or "hemineglect" in athletes. Fortunately, these basketball players are not blind but have enormous difficulty paying attention to objects in the contralateral visual hemi-field. It is that the neuronal activity is little amplified and much weaker than it induces shooting errors (Marti, 2016). On the other hand, ethanol would be responsible for the thiamine deficiency that can cause disastrous effects on the nerves and the brain (Timary, 2016). Moreover, if thiamine contributes to the energy metabolism of brain cells, thiamine deficiency is, on the other hand, one of the consequences of alcohol dependence syndrome (Farquet et al., 2017).

Our results seem to reveal the presence of confusional syndromes in athletes during intense sports activities. These syndromes would refer mainly to cognitive disorders, dementia and delirium. Indeed, delirium classically designates a global and reversible alteration of cognitive functions following the ingestion of a toxic product such as alcohol or drugs. Of course, this ingestion also has major effects in the form of bodily damage such as the cardiac aspect. The clinical signs combine a decrease in attention, an alteration of the sleep/wake rhythm, spatiotemporal disorientation, perceptive disorders and a profound disturbance of the emotional state, including anxiety and panic. The source being clearly somatic, it is necessary to question other elements relating to the history of the sportsmen. That is to say that something would have happened during their development and which manages to manifest itself outside only through the model of visual disturbances. How is an athlete led to depend on alcohol or any other toxic substance to assert his physical performance?

Undoubtedly, the athletes would be victims of narcissistic wounds, which seem consecutive to the somatic pathology. Since African players in general and Congolese in particular are famous for clumsiness when shooting at goals in handball, or when shooting baskets in basketball. This is apparently the expression of the influence of the signs of dementia? Since dementia is a syndrome marked by the presence of several persistent cognitive deficits, which is expressed harmfully by memory failures. If the memory is failing, it is because the daily functioning of the subject is deeply

disturbed. Moreover, ethyl alcohol is not the only harmful element that can accredit the suspicion of dementia in athletes. The evidence of dementia situations would come from another avenue, namely the sexual behavior of athletes, in particular neurological damage following infection by sexually transmitted diseases whose evolution can lead to an irreversible picture of dementia. Athletes, historically having disorders of vascular origin, involving the loss of function of certain brain areas, also lead to the outbreak of dementia.

Thus, as for the place of the clinician in this kind of social reality in the pathological sports population, one could wrongly think that only medical and re-educational approaches are required. However, the current trend designates psychocognitivists or neuropsychologists and psychopathologists as professionals who legitimately have a place in the care system. Classically, this need should mobilize African specialists to work for the psychology of counseling or counseling in mental preparation. Such structures would be dedicated to helping athletes with mental disorders, especially in African countries, according to three possible fields of intervention for the clinician (the patient, the family and the group). At least, an attentive listening position will allow us to go beyond the simple exploration of the patient's history to try to understand the deep issues around the alcoholic culture in athletes.

Some athletes drink alcohol to celebrate the phenomenon of moral libertinism. Others drink primarily, either to delay early physical fatigue by increasing pressure, or to dissipate moods aroused by panic and fear of the adversary. Another category to activate the action of superstitious beliefs. But the consequences are more worrying than they actually appear. If open-eye shot failure scores are telling proof of the harmful influence of ethyl alcohol on the neurons of athletes, it is because the results show the difficulty players have in visually covering the extent of the scope. With more or less variations from one eye to the other, the particularity of the open left eye only showed good visual acuity sporadically. Open-eye shooting results showed massive weaknesses in visual photography with ethyl alcohol-soaked cognition. Therefore, the trajectories of the eyes are drastically different when the athlete drunks alcohol, because it is difficult for him to explore a visual scene. It is true that at this stage, several systems, endogenous and exogenous, interfere to the point of biasing the images until the degradation of the player's performance. A clinical form of licentiousness is to be discussed in athletes who drink alcoholic beverages, taking into account the behavior across a diversity of cultures. The current results observed within the framework of this study make it possible to raise the importance of neuropsychological assessments of the sportsmen in order to be able to diagnose the behavioral or psychic phenomena undesirable occurring on the sports terrain. Just like, they could help detect many psychopathological disorders that are largely underdiagnosed in our sports training. Even if this diversity of results could be interpreted differently, it would be necessary in the future to scrutinize the range of emotional motivations of drinkers in times of sports competition. Because, emotions involve taking into account information, elaborated and conscious, relating to the antecedents and consequences of actions. The issue of the festive tradition, from one culture to another, could perhaps

be called upon to better shed light on these motivations. This is the ambition that convinces us not to leave the ship ensuring the correspondence between “destructive alcohol” and “the organizing mind” of athletes. Our scientific projections can then open up to the questioning of social cognitions, genetic and social factors at the heart of the traditions where the psychopathologies of the athlete are born, hitherto unknown.

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