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*Effect of strobe visual training by
(vima rev) on dyolo tchagui
performance in taekwondoists aged
13-14 years*

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Abstract :

This is an experimental study because it allows us to address the problem of our subject and achieve precise results. The vima rev glasses (the tool of our research) included different stimulations to disrupt vision, the use of this tool was related to various and related to the objectives of each session and the proposed program.

06 taekwondoists (age: 13.66 ± 0.51) (height: 1.60 ± 0.09) (weight: 42.66 ± 8.09) (experience: 1.66 ± 1.21) were evaluated during the end of August early September more precisely from August 24 to September 03. The sample was evaluated according to the 05 protocols related to two physical qualities is two visual skills: (the reaction speed of the dollyo chagui technical gesture, eye-foot coordination, lateral coordination right foot and left foot, visual field, right and left dominant eye) the visual strobe program included 10 sessions, each session had a specific purpose, and each goal was an essential element to develop the technical gesture studied.

the reaction rate test was well signifying between the first test and the last test, $p < (0.01)$ or 1%, and that there is a significant difference between the two tests and the difference was in favor of the second test. The eye-foot coordination test was well meaning $P < (0.01)$ or 1%, and that there is a significant difference between the two tests the difference in favor of the second test. In the last physical quality test of lateral coordination eye-foot (right foot) and (left foot) were in turn significant: -Right foot: $P < (0.01)$ or 1%, it is said that the test is significant and that there is a significant difference between the two tests the difference in favor of the second test. -Left foot: $P < (0.01)$ or 1%, it is said that the test is significant and that there is a significant difference between the two tests the difference in favor of the second test. -Left foot: $P < (0.01)$ or 1%, it is said that the test is significant and that there is a significant difference between the two tests the difference in favor of the second test.

Keywords:

Strobe visual training, optimizing the performance of dollyo chagui in taekwondoists, Le Vima Rev Sport

Introduction:

Humans have a remarkable ability to learn and adapt, but surprisingly little research has demonstrated widespread learning, in which new skills and strategies can be used flexibly in a range of tasks and contexts. (L. Gregory Appelbaum, Julia E. Schroeder, Matthew S. Cain and Stephen R. Mitroff, 2011). In the field of sport, the visual system plays a decisive role in the capture of contextual information; it is one of the most important sensory systems in the exercise of sports skills. Despite such an important role, such a function is rarely taken into consideration when designing a training program by coaches and athletes.

Probably lack of time for inclusion as a factor in the training program or insufficient research results showing the importance of the visual system in athletes' success. There may be reasons why he does not pay enough attention to it.

Problematic:

In this study we will start a Viso motor training program in stroboscopic visual conditions by an experimental study in order to answer the following problem:

-Can visual training optimize the performance of dollyo chagui in taekwondoists?

Hypotheses :

on this it is predicted that: -A sports vision training program will lead to better performance of the dollyo chagui technical gesture.

Objectifs :

This study therefore aims at the following points: -To improve visual awareness.

-Faster processing of information. -Faster reaction skills.

-improved accuracy.

-Fast error recovery.

-Increased attention span.

-Improve strategy and technique under pressure.

all this leads us mainly to the visual aspect motor centered on the stimulation that causes the action and the right performance

Définition of Concept:

Strobe visual training involves individuals performing motor tasks while being exposed to intermittent vision conditions, usually in the form of specialized glasses used to use a strobe effect that contain lenses programmed to switch between clear and opaque states. (Luke Wilkins, Year:2015, Page:33).

The Vima Rev Sport: is a piece of wearable technology that allows athletes to train their vision more efficiently, made in the United States and designed to work in the harshest training conditions. Coaches can use

the Vima Rev Sport to improve vision and response through strobe training. The lenses of the glasses work like strobe lamps. They alternate between clear and obstructed fields of view to improve a person's ability to aim at an oncoming object.

Type of study: This is an experimental study because it allows us to address the problem of our subject and achieve specific results.

-The experiment is carried out during the period:

-This research took place in the last week of August and the beginning of September more precisely from August 24 to September 03.

The place of the research:

-All the training sessions took place at the Daksi Makhlouf Boukhzar gym, wilaya of Constantine.

Subjects:

As part of our research, these are 06 taekwondoists aged (13-14 years) of female sex, from the taekwondo club (Achbal Constantine), evolving in the wilaya of Constantine. The research community of this study is 12-13-14 in age and is (45 athletes) 17 girls and 28 boys.

Weekly training hourly volume: 6 hours of training per week for 4 weeks.

Search variables: Independent variable:

- strobe visual training.
- vima rev.

Dependent variable:

- the technical gesture dollyo chagui.

Data and information collection tools:

The following tools and devices were used:

- Medical scale to measure weight.
- the toise to measure the size
- teaching materials specific to the discipline
- camera and video of a smart phone.
- IT tools. -strobe glasses of vima rev.

Statistical calculations:

We used descriptive statistical analysis: which makes it possible to characterize the population and more precisely the series of values of a variable that it contains by using as a parameter the mean, the standard deviation Analytical statistics: also called nonparametric statistics, is used to have more information about the values of the different variables of the sample. For the resolution of the fixed objectives we used the t-TEST.Shappiro wilk.wilcoxon., The calculations were carried out with the software EXECEL 2010 and SPSS 21.0

The characteristics of the research sample:

Figure n°01: The graph shows the characteristics of the research sample

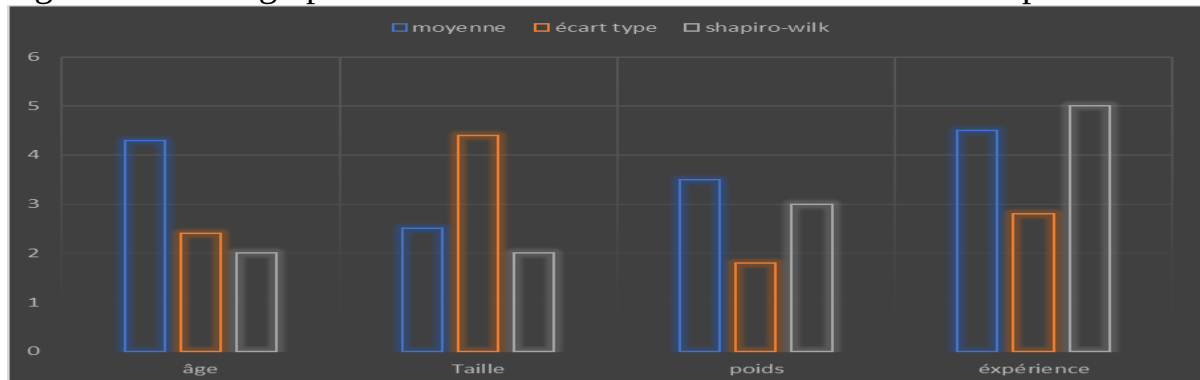


Table n°01: shows the characteristics of the research sample

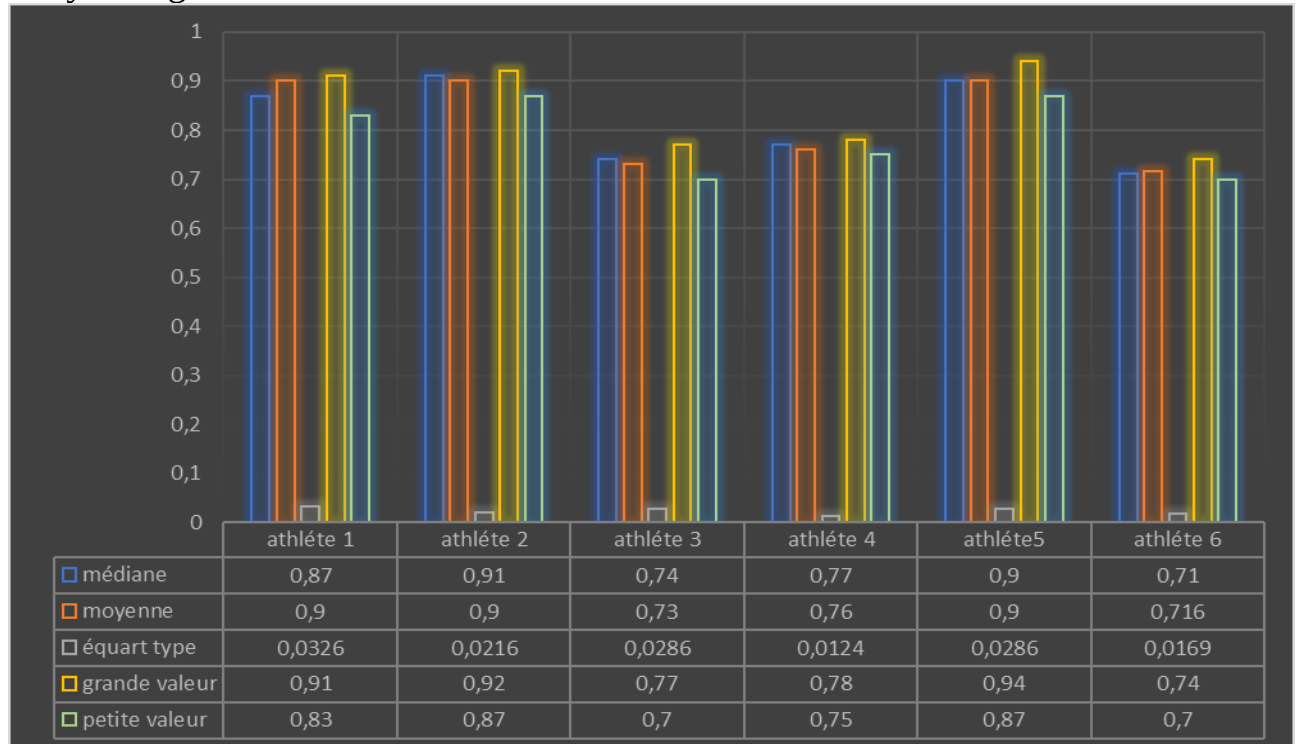
the variables	Arithmetic average	Standard deviation
age	13,66	0,51
tall	1,60	0,09
weight	42,66	8,09
experiance	1,66	1,21

We will present these results in tables to allow us to analyze and represent them graphically, and at the end we will discuss and interrogate them with our previous hypotheses and studies to confirm and answer the questions raised.

1-Presentation of the results of the physical qualities studied and some visual skills: Analysis of the results of the speed of technical gesture dollyo chagui before and after the strobe visual training:

1-the results of the athletes during the pre-test:

Figure n°02: results of the pre-test of the speed of technical gesture dollyo-chagui.



2-measure the Shapiro-wilk significance (normal distribution) of the pre-test:

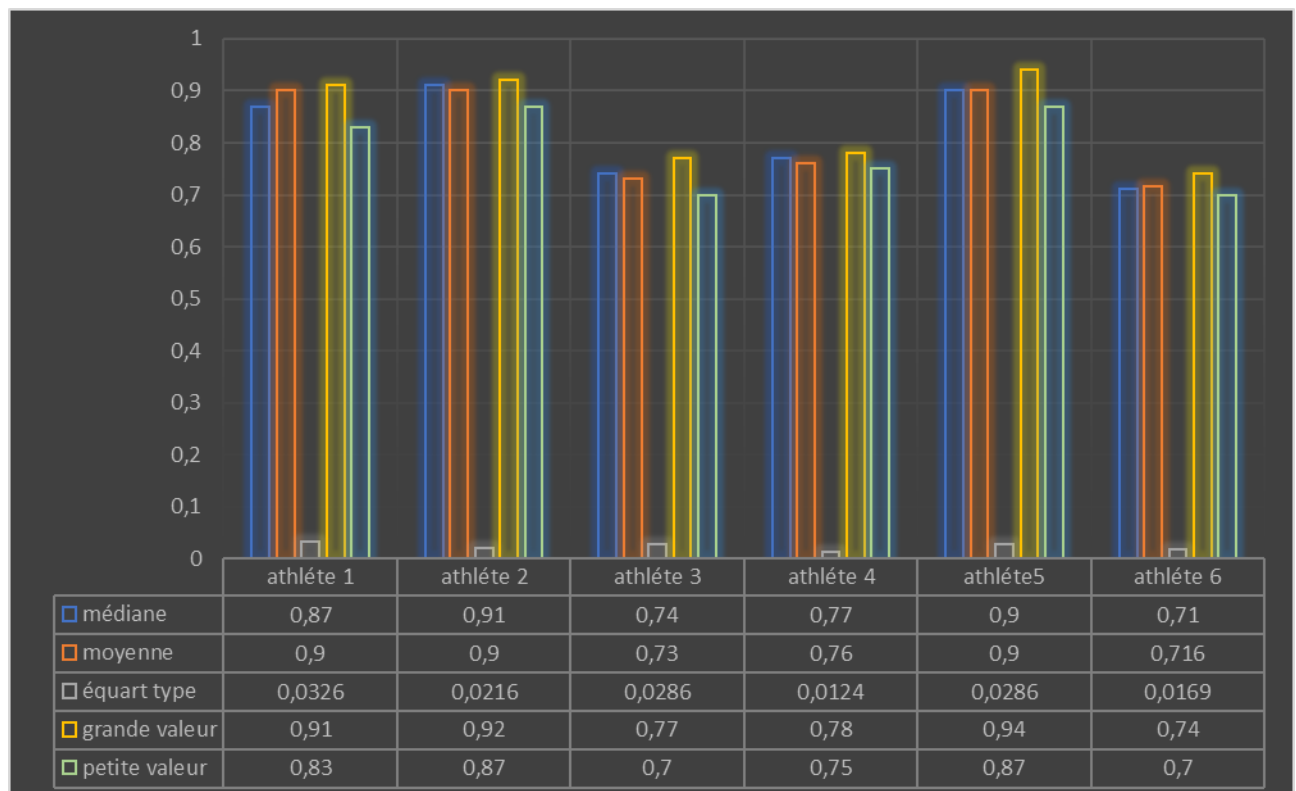
Table n°02: shows the shapiro-wilk meaning (normal distribution) of the pre-test reaction speed of the dollyo-chagui gesture

Shapiro-Wilk		
Statistic	df	Sig.
,841	6	,134

After measuring the arithmetic average of each player during these three tries at the pre test of reaction speed of the technical gesture dollyo chagui, the meaning of Shapiro-wilk is 0.13. As long as the meaning of the Shapiro-wilk $0,13 > 0,05$ of the error rate is said to mean and the data is distributed in a normal distribution.

2-The results of the athletes during the post-test:

- Figure n°03: results of the post-test of the dollyo-chagui technical gesture speed.



2-Measure the Shapiro-wilk meaning (normal distribution) of the post-test:

Table n°03: shows the shapiro-wilk meaning (normal distribution) of the post-test of reaction speed of the dollyo-chagui gesture.

Shapiro-Wilk		
Statistic	df	Sig.
,922	6	,522

After measuring the arithmetic average of each player during these three tries at the post reaction speed test of the dollyo chagui technical gesture, the meaning of Shapiro-wilk is 0.52. As long as the meaning of the Shapiro-wilk $0.52 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

- From there, the t-test of differences can be used.

-3After processing the two pre-test and post-test results we obtained the following results:

Table n°04: shows the probability value of t-test between the pre-test and the post-test

	average	Variance	Degree of freedom	Error rate	Statistic T	Critical value of t (bilatéral)	P bilatéral
Pré test	0,81	0,0062	5	0,01	11,48	2,57	8,77×10 ⁻⁵
Post test	0,57	0,0021	5	0,01			

Thus, the test value (8.77×10^{-5}) is lower than the error rate (0.01) or 1%, it is said that the test is significant and that there is a significant difference between the two groups and since the positive test sign and the speed we evaluate over time the difference in favor of the second test.

Analysis of eye-foot coordination results before and after strobe visual training:

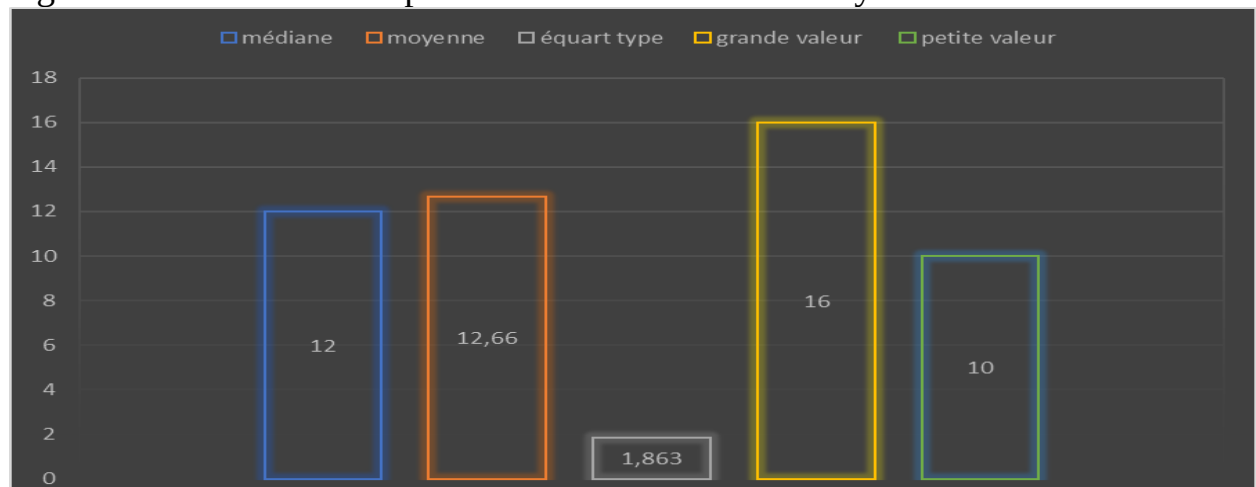
-The results of the athletes during the pre-test:

Figure n°04: results of the pre-test of the coordination-eye and foot.



_ Athletes' results after the post-test:

Figure n°05: results of the post-test of the coordination-eye and foot.



3-After processing the two pre-test and post-test results we obtained the following results:

Table n°05: shows the probability value of t-test between the pre-test and the post-test. Tableau n°05: montre la valeur de probabilité de t-test entre le prétest et le post-test.

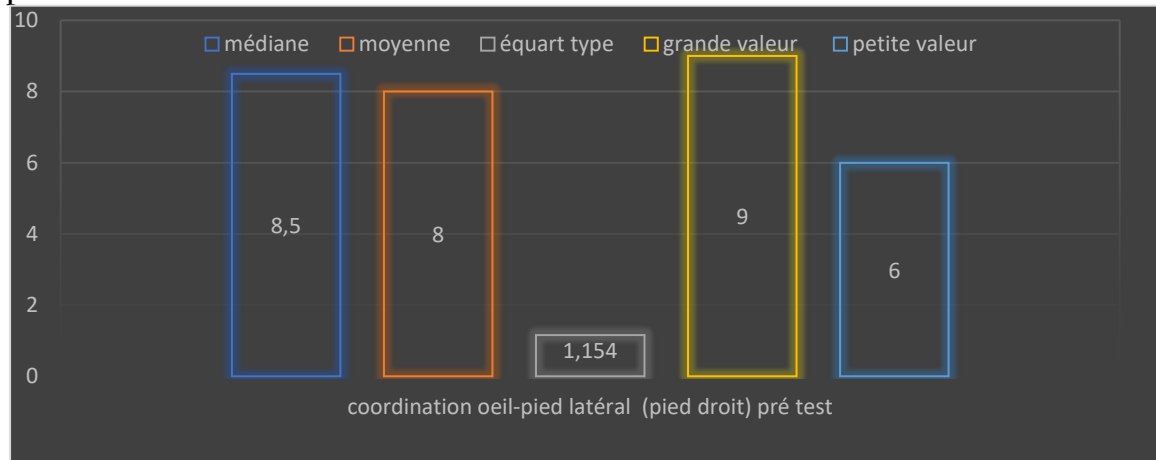
	average	Varian ce	Degree of freedo m	Error rate	Statistiq ue T	Critical value of t (bilatéral)	P bilatéral
Post test	7,5	1,1	5	0,01	-5,29	2,57	0,00321
Pré test	12,66	4,16	5	0,01			

Thus, the values of t-test (0.00321) is lower than the error rate (0.01) or 1%, it is said that the test is significant and that there is a significant difference between the two groups and since the sign of statistics t is negative therefore the difference in favor of the second test.

Analysis of the results of Right Foot Eye-Foot Coordination before and after strobe visual training:

1-results of athletes during the pre-test:

Figure n°06: results of the coordination-eye lateral foot (right foot) of the pre-test.



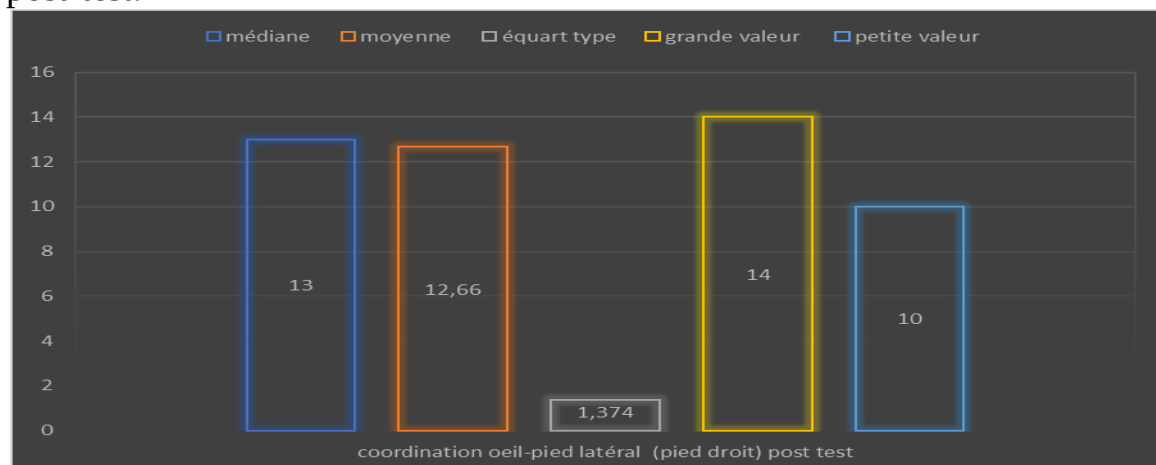
2-measure the Shapiro-wilk meaning (normal distribution) of the pre-test
Table n°06: the Shapiro-wilk meaning (normal distribution) of the pre-test of the eye-foot coordination (right foot).

Shapiro-wilk		
Statistic	df	Sig.
,831	6	,110

The results of the first test in the pre-test of eye-right foot coordination, the meaning of Shapiro-wilk is 0.11. As long as the meaning of the Shapiro-wilk $0,11 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

1-results of the athletes during the post-test:

Figure n°07: results of the coordination-eye lateral foot (right foot) of the post-test.



2-measure the Shapiro-wilk meaning (normal distribution) of the post-test:

	average	Variance	Degree of freedom	Error rate	Statistic T	Critical value of t (bilatéral)	P bilatéral
Pré test	8	1,6	5	0,01	-5,29	2,57	-5,291
Post test	12,66	2,26	5	0,01			

Figure n°07: results of the coordination-eye lateral foot (right foot) of the post-test.

Shapiro-Wilk		
Statistic	df	Sig.
,866	6	,212

The results of the first test in the post-right foot eye-foot coordination test, the significance of Shapiro-wilk is 0.21. As long as the meaning of the Shapiro-wilk $0.21 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

-From there, the det-test of differences can be used.

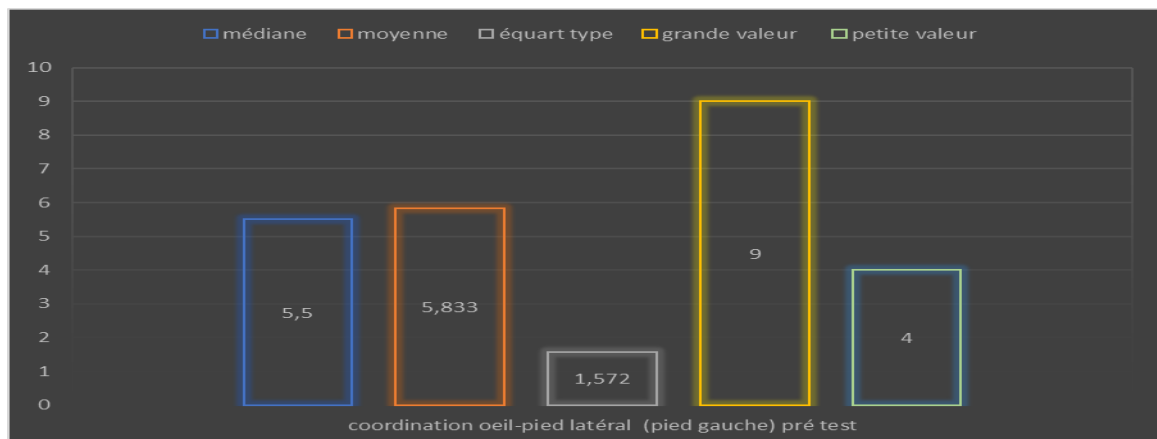
3-After processing the two pre-test and post-test results we obtained the following results: Table n°08: shows the probability value of t-test between the pre-test and the post-test.

Thus, the values of t-test (-5.291) is lower than the error rate (0.01) or 1%, it is said that the test is significant and that there is a significant difference between the two groups and since the sign of statistics t is negative therefore the difference in favor of the second test.

Analysis of the results of Left Foot Eye-Foot Coordination before and after strobe visual training:

1-results of the athletes during the pre-test:

Figure n°08: results of the coordination-eye lateral foot (left foot) of the pre-test.



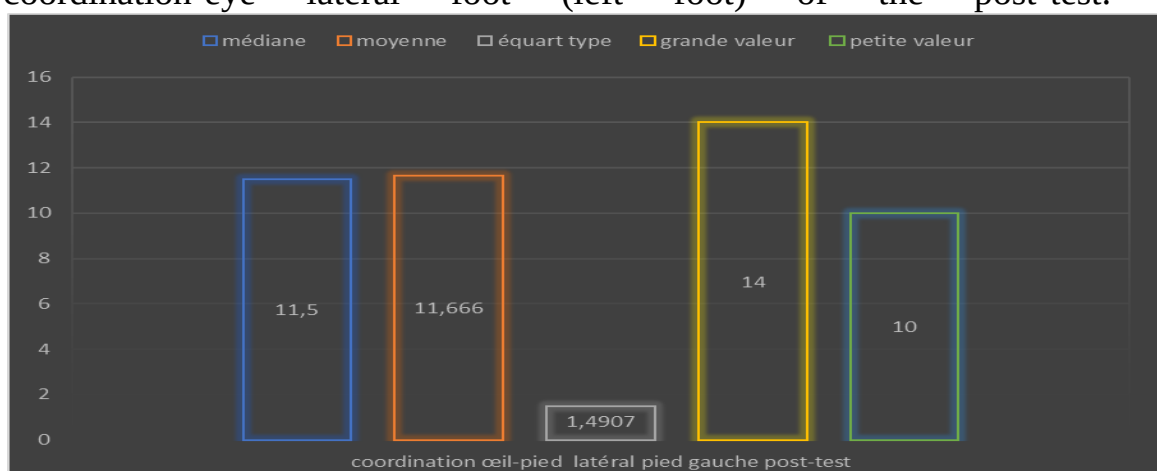
1-measure the Shapiro-wilk significance (normal distribution) of the pre-test:

Table 09: shows the Shapiro-wilk meaning (normal distribution) of the pre-test of the lateral foot (left foot) eye coordination test.

Shapiro-Wilk		
Statistic	df	Sig.
,866	6	,210

The results of the first test in the pre-test of eye-foot coordination left foot, the meaning of Shapiro-wilk is 0.21. As long as the meaning of the Shapiro-wilk $0.21 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

1-results of the athletes during the post-test: Figure n°09: results of the coordination-eye lateral foot (left foot) of the post-test.



2-measure the Shapiro-wilk significance (normal distribution) of the post-test:

Table 10: shows the Shapiro-wilk meaning (normal distribution) of the lateral foot (left foot) coordination-eye post-test.

Shapiro-Wilk		
Statistic	df	Sig.
,920	6	,505

The results of the first test in the post-test of eye-foot coordination left foot, the meaning of Shapiro-wilk is 0.50. As long as the meaning of the Shapiro-wilk $0.50 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

- From there, the t-test of differences can be used.

3-After processing the two pre-test and post-test results we obtained the following results:

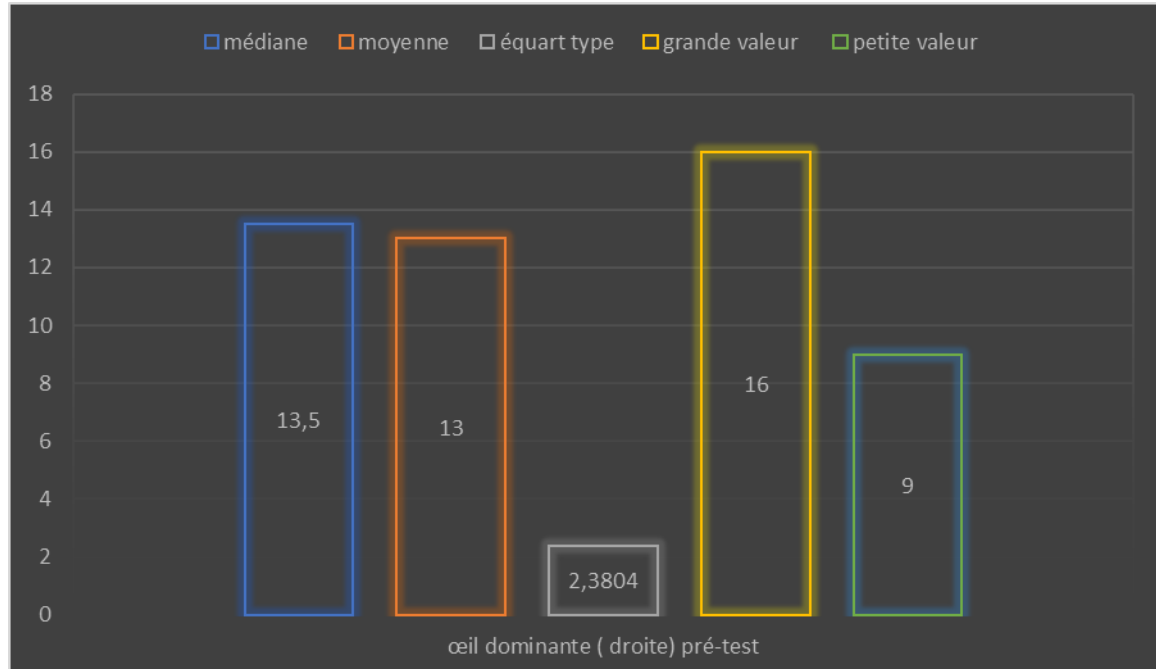
Table 11: Shows the probability value of t-test between pre-test and post-test.

	average	Variance	Degree of freedom	Error rate	Statistic T	Critical value of t (bilatéral)	P bilatéral
Pré test	5,83	2,96	5	0,01	-8,29	2,57	0,000415
Post test	11,66	2,66	5	0,01			

Thus, the t-test values (0.000415) is lower than the error rate (0.01) or 1%, it is said that the test is significant and that there is a significant difference between the two tests and since the statistic sign t is negative therefore the difference in favor of the second test.

Analysis of the results of the right dominant eye before and after strobe visual training:

1-pre-test athlete results: Figure n10: dominant eye results (right), pre-test.



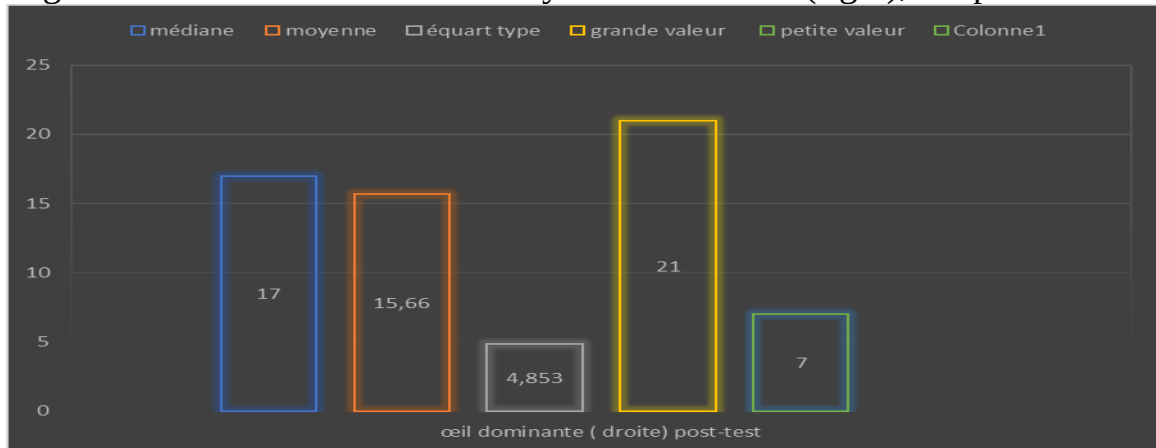
1-measure the Shapiro-wilk meaning (normal distribution) of the pre-test: Table 12: shows the Shapiro-wilk meaning (normal distribution) of the pre-test right dominant eye.

Shapiro-Wilk		
Statistic	df	Sig.
.960	6	.817

The results of the first test to the post-test of the right dominant eye, the significance of Shapiro-wilk is 0.81. As long as the meaning of the Shapiro-wilk $0.81 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

2-results of post-test athletes:

Figure n°11: dominant eye results (right), post-test.



2-mesurer la signification de Shapiro-wilk (distribution normale) du post-test :

Tableau n°13: montre la signification de Shapiro-wilk (distribution normale) du post-test l'œil dominante droite.

Shapiro-Wilk		
Statistic	df	Sig.
,923	6	,530

The results of the first test at the post-test of the right dominant eye, the significance of Shapiro-wilk is 0.53. As long as the meaning of the Shapiro-wilk $0.53 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

- From there, the de t-test of differences can be used.

3-After processing the two pre-test and post-test results we obtained the following results:

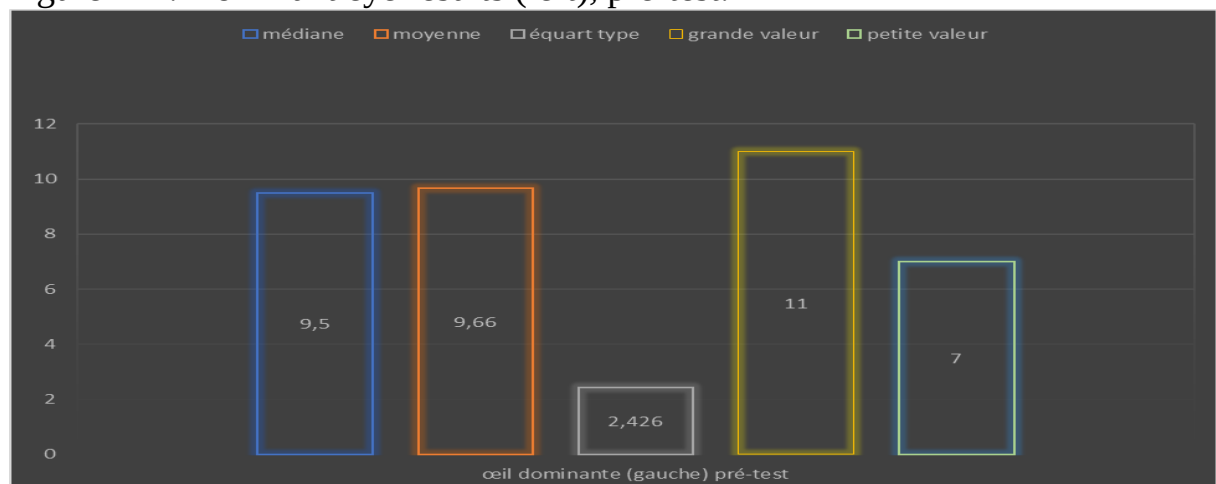
Table n°14: shows the probability value of t-test between the pre-test and the post-test.

	avera ge	Varia nce	Degree of freedo m	Erro r rate	Statistiq ue T	Critical value of t (bilatéral)	P bilatéral
Pré test	13	6,8	5	0,01	-1,384	2,57	0,2248
Post test	15,66	28,26	5	0,01			

*Thus, the t-test values (0.2248) is higher than the error rate (0.01) or 1%, it is said that the test is not significant and that there is not a significant difference between the two tests.

Analysis of the results of the left dominant eye before and after the strobe visual training: 1-results of the pre-test athletes:

Figure n12: Dominant eye results (left), pre-test.



1-measure the Shapiro-wilk significance (normal distribution) of the pre-test:

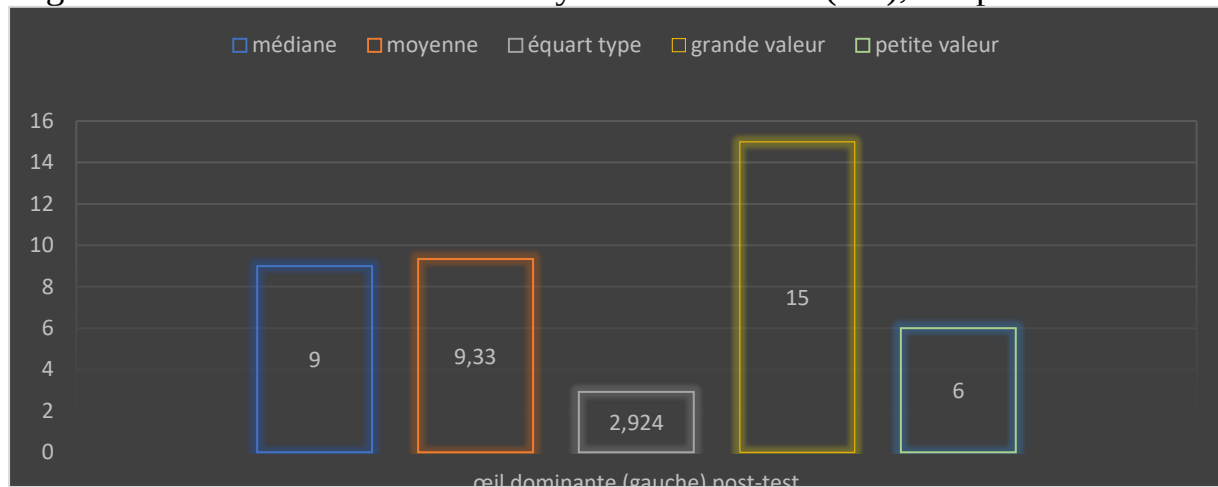
Table 15: : shows the significance of Shapiro-wilk (normal distribution) of the pre-test the left dominant eye

Shapiro-Wilk		
Statistic	df	Sig.
,923	6	,530

The results of the first test to the post-test of left dominant eye, the significance of Shapiro-wilk is 0.53. As long as the meaning of the Shapiro-wilk $0.53 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

2-results of the post-test athletes:

Figure n°13: dominant eye results (left), post-test.



2-measure the Shapiro-wilk meaning (normal distribution) of the post-test: Table 16: shows the Shapiro-wilk meaning (normal distribution) of the post-test the left dominant eye

Shapiro-Wilk		
Statistic	df	Sig.
,902	6	,387

The results of the first test to the post-test of the left dominant eye, the significance of Shapiro-wilk is 0.38. As long as the meaning of the Shapiro-wilk $0.38 > 0.05$ of the error rate is said to mean and the data is distributed in a normal distribution.

- From there, the t-test of differences can be used.

3-After processing the two pre-test and post-test results we obtained the following results:

Table n°17: shows the probability value of t-test between the pre-test and the post-test.

	average	Variance	Degree of freedom	Error rate	Statistic T	Critical value of t (bilatéral)	P bilatéral
Pré test	9,66	7,06	5	0,01	0,337	2,570	0,7497
Post test	9,33	10,26	5	0,01			

Thus, the t-test values (0.7497) is higher than the error rate (0.01) or 1%, it is said that the test is not significant and that there is not a significant difference between the two tests.

Discussion of results:

Discussion of the results of the first hypothesis:

1-According to tables n° 2.04, 07, 10 .13.17 and the graphs of the post-test which showed an optimization in the physical skills (reaction speed of the technical gesture, the eye-foot coordination, the lateral eye-foot coordination (right foot) (left foot)).

Because according to our results the reaction speed the test was very significant between the first test and the last test, the t-test values t were (8.77×10^{-5}) lower than the error rate (0.01) or 1%, and the difference was in favor of the second test. Thus the eye-foot coordination results the t-test values were (0.00321) lower than the error rate (0.01) or 1%, it is said that the test is significant and that there is a significant difference between the two groups and since the statistical sign t is negative so the difference in favor of the second test.

In the last test of physical quality of lateral coordination eye-foot (right foot) and (left foot) were in turn meaning:

-Right foot: Thus, the values of t-tests were (-5.291) lower than the error rate (0.01) or 1%, it is said that the test is significant and that there is a significant difference between the two groups and since the sign of statistics t is negative therefore the difference in favor of the second test.

-Left foot: Thus, the t-tested values of (0.000415) are lower than the error rate (0.01) or 1%, it is said that the test is significant and that there is a significant difference between the two tests and since the sign of statistics t is negative so the difference in favor of the second test.

Our results are consistent with the results of previous studies:

The 1st research using vima rev strobe glasses states this from the results of Schwab, S. and Memmert, D. (2012):

-The experimental group that trained with strobe glasses showed a significant improvement in the timing of anticipation, as opposed to the control group that showed no improvement.

Based on 2nd strobe research by L. Gregory Appelbaum, L.G., Schroeder, J.E., Cain, M.S. and Mitroff, S.R. (2011).

-Affirmed that: During strobe training increases the ability to quickly process visual information which led to a fast execution is coordinated with the technical gesture.

-Strobe training led to a 25.7% improvement in visual sensitivity to movement.

-Strobe participants significantly improved accuracy performance by 2.21%, while control participants worsened by 0.83%.

According to the 3rd research Schwab, S. and Memmert, D. (2012):

Stated that: Professional ice hockey players performed better in skills relevant to their sport (scorers became better at scoring goals and defenders became better at making long passes) after wearing strobe glasses during their normal training activities. We obtained the same results because the taekwondoists became faster and chained even more strikes than before, and also they improved their two feet of strikes and especially their left strike which was a little complicated for them with the help of the visual disturbance that allowed them to have a very complicated but effective preparation.

2-And according to table n°15, and the graph of the post-test which showed an optimization at the level of the visual field only according to the visual skills studied (the visual field, the dominant eye (right eye) (left eye)).

Because according to our visual field results the meaning of Wilcoxon was 0.028. <0.05 of the error rate is said that the test is significant and that there is a significant difference between the pre-test and the post-test. Unlike the results of the dominant eye (right eye) (left eye) which were not significant:

-Right eye: the value of the t-test was (0.2248) higher than the error rate (0.01) or 1%, it is said that the test is not significant and that there is not a significant difference between the two tests.

-Left eye: the values of the t-tests were (0.7497) higher than the error rate (0.01) or 1%, it is said that the test is not significant and that there is not a significant difference between the two tests.

-This concludes that this program did not have an influence on the dominant eye but it had a remarkable development to the other elements tested.

So our hypothesis is validated which predicts that (A sports vision training program will lead to better performance of the dollyo chagui technical gesture).

Conclusion: In conclusion, our initial hypothesis is validated: Strobe visual training allowed an optimization of the technical gesture (dollyo chagui) in young taekwondoists. Strobe visual preparation has resulted in motor development in savings in reaction time and execution of the specific task by improving various physical and perceptual qualities. Among these, the most important and consequent are the inertia of the sequence and the speed of the strikes and the rapid execution of footwork as well as the reflex and the concentration led by visual stimulations, So this training allowed to have developments in several visual aspects in taekwondoists as their width of the peripheral visual field.

Each event given to the athletes had a significant performance, despite the difficulty of each stage, with an adaptation according to the disturbance imposed.

The results of the study seem to confirm the hypothesis raised the greatest effect concerned physical qualities.

We are aware, however, that our study has limitations such as highlighting factors of duration to establish a more effective program.

At the end we can add the fact that the vision influenced these results independently.

Sources and references:

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3-Schwab, S. et Memmert, D. (2012). Hockey.(Journal of Sports Science and Medicine, 11, 624-631.)