100 - THE EFFECT OF THE BIOFEEDBACK’S TECHNIC IN THE ATTENTION OF THE YOUTHFUL’S ATHLETES FROM

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Introduction: Investigations about the processes of the attention's influence regarding to the perception of the signs have showed a strong hypothesis of a existence of the two principals ways (connections) of the attention control, one of them is connecting the thalamus, the tonsil, the parietal cortex, and the visual cortex, and the other with neural connections of the thalamus, frontal cortex, parietal cortex, and visual cortex. This theory is known as top-down or top-down. It introduces a processing very refined of analyse from stimulus, however with much time to its execution of processing and generations of reply in relation a bottom-up. Theses connections can introduce capacity of morphology alteration that It's responsible to change of this function reflecting in the demeanor. Speaking about the process of attention the memory of work, that It’s responsible for keeping a stimulate dice for a determinate period of time until that the replies will be begettton of a refined form, It's mentined as a great importance and It's being one of them responsible for the control top-down.

The capacity of modification in the neural morphology as the process of strengthening of neural areas is introduced as a result of exposition to a determinate ambient of a natural form or though of enrichment of the ambient in an artificial form. This factor brought the change regarding to the work of rehabilitation of the nervous sistern and also in the improvement of capacities in healthy people regarding to the improvement of the attention's performance, several works have investigated the effect of the strengthening in the stimulate of an artificial ambient enrichment to people usually show problems of attention, but They aren't normal the conducted works in the improvement of a attention in healthy people, and according to Abes (2004), the capacity of attention in athletes is a determining factor in efficiency of the athlete with regard to the assignment.

In the science of the sport, the research accomplished for Mikheey et al. (2002), with judocas sportmen and Rodrigues, Vickers and Williams (2002), with games of table tennis, They've checked the natural process of the demeanor change provoked for the long exposition regarding to the ambient specific requests of the sport. At this rate, It was not observed any disquisition that introduced the application from methods of the artificial enrichment, that they would result in the demeanor change not being the exigence regarding to the exercised sport.

On the other hand, the demeanor psychology introduces several technics of cognition's changes and in the demeanor. Between the technics utilized to the apprenticeship and promotion of the neural plasticity we can see the technic of biofeedback that It allows to the fellow making a change in his neural structure and physiological though of an apprenticeship regarding the mechanism of self-control fortifying, so, the ways of action involved in the demeanor process. The technic of biofeedback was already studied with the science of sport regarding the capacity of improvement in physic's order.

The research accomplished for Harris & Harris (1984) of a selective visual attention adapted to a version using the computer by LANESPE/CENESPE/UFSC, where there's a destined version to evaluate the visual attention with memory of work (A) and the other does not have it (B).

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It was checked the selective visual attention of: a) short duration with memory of work and no memory of work, regarding it consisted in the time of 120 seconds, b) long duration with or no memory of work, that it consisted of the necessary time to effect the remainder of the test before the 120 seconds. It was effected 7 interventions of 10 minutes with an interval of 4/5 days between the interventions. The interventions were effected though of a software named Mentalgames (Audiostroble), that they consisted in producing control about a stimulate in the web of a computer, commanded though of the sky (galvanica) reply (SGR), regarding it was collected by the Thought/sreal equipment and It sends the records of the electric's flux to the computer. The game proposes 4 stages that tThey would should be surpassed though of self-control if the sky (galvanica) reply where the 2 first stages the fellow had to decrease the electric conductivity, the third the fellow had to keep it and the fourth he had to increase and or augmenting to keep it inside of a scale beginning in elevated value, decreasing and elevating again. To the analyse of dice, it was utilized the statistician package named BioEstat 3.0. to the analyse between before or after the test, It was utilized the test named não-paramétrico from Wilconox and the correspondance from Spearman.

Results: The groups suffered losses of fellows due to transfer of clubs, lesions and expire of agreement, being that : the G1 had a loss of 2 fellows and G2 of 5 fellows. The chart 01 introduces the values of the averages and deviation models of the group G1 and of short and long duration, before and after the test.

<table>
<thead>
<tr>
<th>Grupo</th>
<th>Short (before)</th>
<th>Short (after)</th>
<th>Long (before)</th>
<th>Long (after)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1-A</td>
<td>18,79±8,6</td>
<td>13,29±4,11</td>
<td>8,85±1,78</td>
<td>6,78±1,02*</td>
</tr>
<tr>
<td>G2-A</td>
<td>13,12±3,15</td>
<td>13,9±5,79</td>
<td>8,4±2,1</td>
<td>9,01±2,58*</td>
</tr>
<tr>
<td>G1-B</td>
<td>24,52±8,33</td>
<td>18,48±12</td>
<td>13,93±1,67</td>
<td>12,14±2,11</td>
</tr>
<tr>
<td>G2-B</td>
<td>31,6±16,27</td>
<td>17,94±13,33*</td>
<td>14,82±7,05</td>
<td>10,89±3,93*</td>
</tr>
</tbody>
</table>

*They are significant differences to the statistics

To the test B in the G1 It wasn't observed any differences, however in this test there was a fellow that showed discrepant values in both periods, being that the exclusion this fellow the average of time to the visual search lessened to 15.4s in the period of short duration and 11.7s to the period of long duration, introducting so, a significant value of p<0.05 between before or after the test with memory of work against no memory of work showing a change of demeanor in the experimental group, however this change does not happen in the control group. The demeanor of the correspondences between the two tests (A and B) are introduced in the figure of:

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Boynton (2002), of the parietal cortex in the selective visual attention, and e) with the results from observation that were found for al., (2000), antecipated activation from the retinótico neural system in the spatial selective visual search with the results from movement of search. The retinitópico map in the superior colículo, d) in the visual cortex and pariental and e) in the motora reply of the eye( sacadico of training from the specify stage and games of official’s competitions. So, the results proposed that the improvement was the activities effected for the specify training of soccer, once that before the tests, It was effected in the end of the basic stage time to the adaptation og the responsible sistem for this process, so the attribute of biological individuality from every fellow to cortex though of strengthening of chosen beforehand stimulus. 

This hypothesis is according to the results introduced for: a) Serences et al, (2004), regarding an increase of the anticipated activation from the retinótico neural system in the spatial selective visual search with the results from Easey et. al., (2000), regarding the differentiation of drive of lateral geniculado nuclei depending of the selective visual attention; c) the observation that were found for Delorme et al., (2004) regarding to the anticipcation if the drive form the parietal cortex in the generation of the selective visual attention of search; d) with the Driver and Mattiengay’s dice(1998) regarding the importance of the parietal cortex in the selective visual attention, and e) with the results from Freeman, Sagi & Driver (2001) that they showed the importance of the peripheral vision in the search and perpception of stimulus in the visual field. The dice of the supposed disquisition are also according to the results introduced for: a) Saenz, Buracas and Boynton (2002), regarding the global search effected mainly by the peripheral vision as a determining factor to the 

Discussion: regarding the results found with the two tests of selective visual attention, the significant differences obtained for both the groups ( in the experimental group together in the test with memory of work and in the control group together to the test no memory of work). They could be maintained initially for the results of the efected works from Biernaskie & Covbett (2001), Graybiel (2004) and Dan & neural sistem in changing or creating new sinapticas connections. According to the authours, the neural system introduces a capacity constant of change of neural order and of neural connection, they are produced by the stimulus that came from the ambient or the processes that are induced as an artificial and It would be theses changes the responsible for our apprenetshipese, memory and demeanor.

This way, the significant differences found in the statistics in the experimental group, but not in the control group, in the selective visual attention of long duration between before and after the test (A) (with memory of work). They can be explained for the strengthening for the neural sistem of the frontal cortex that is responsible for the memory of visual work, control of the emotion stimulus and taken of decision of an origin named top-down. The involvement of the frontal cortex in the control of the RGP’s action was documented from the work of Chitchle et al., (2002), where it observed a strong drive of the frontal cortex preceding to the RGP’s stimulus and from Bechara (1999), Bechara (2000), Dan & Lisman (2003) and Praamistra et al. (2005), they observed that the frontal cortex is responsible for the process of top-down, regarding It produces a voluntary control concerning several cerebral areas and Li et. Al (2004) told about it in his disquisition about the visual perception the sistem named top-down influences directly in the primary visual cortex though of strengthening of chosen beforehand stimulus.

There haven’t been any changes the significant change in the selective visual attention of short duration can be connected with the capacity of exchange of attention, where some fellows from the experimental group could to need for more time to the adaptation og the responsible sistem for this process, so the attribute of biological individuality from every fellow to an adaptation of the neural process that It was required the results obtained together the tests, no memory of work), they showed some significant changes just in the control group, theses changes can be connected in the exigences provoked for the activities efected for the specify training of soccer, once that before the tests, It was efected in the end of the basic stage and in the beginning the specify stage of training and the intervention and after the tests. It was efected after the participation of training from the specify stage and games of official’s competitions. So, the results proposed that the improvement was provoked for an increase: a) in the capability of stimulus captionation thru periferic zones of the eye (cellular hypertrophy synaptic) and strengthening of the involved connection, b) in the structure of the side Genicular nucleus of the thalamus, c) in the retinótico map in the superior colículo, d) in the visual cortex and pariental and e) in the motora reply of the eye( sacadico movement of search.

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strengthening and focalizing in the attention to the place of action; b) with the results from 
Ross & Ma-Wyatt (2004), they showed that the sacadico movement yonder to increase the visual perception is necessary to the continuity of the perception and to elevate the strength of stimulus about the action of attention; and c) Astafiev et al. (2004) that they represented the selective visual search being a product of an connection from neural areas contained in the occipital cortex, temporal, cells of the eye and motor system responsible by the movement of the eye and they represented adaptation regarding its exigence to the ambient.

This way. It's believed that the changes happened in the results obtained together to the test B in the control group, it'll be connected to a strength hening of the bottom-up neural regarding to the works up mentioned. This hypothesis still has the support in the results from Dan & Lisman (2003) regarding to the visual system being organized with hierarchy and It's formed from two big principal ways processing informations, an original one top-down and the other bottom-up. Regarding the capacity of change from the neural system to the exigences of the Physical exercise, the dice of the control group in the test B have a significant increase from the works from Astafiev, Kempermann & Gage (2004) together to the process of proliferation and neural neurogênese in mice submettided to the Physical exercise, as well as the results with human introduced for Mikhieev et al. (2002), where it was observed changes in the dominion of the cerebral hemispheres in judocas with a long period of practice, and also with Rodrigues, Vickers, and Williams (2002), that showed some changes in the visual capacity and cognitivas in tables of tables tennis with a long period in practice. Although of the disquisitions have showed that these cognitivas have happened just in athletes with a big period practising of sport, it's believed that there were evidences in a differences in a short period of time, but the authors did not check the fellows with a short time of practice regarding to fellows that do not practice sports.

Failing of significant differences in the experimenatl group together to the test B can be connected that the two fellows from this group did not have an improvement one of them with a long duration), They both neutralized the meaning of the statistician test. This observation can be explained for: 1) biological individuality of the fellows that they could need of more time in adaptation, or 2) in the period of realization after the test any kind of internal or external factor can be injure the discharge. However, with the same dice adjusted no present the discrepant values from theses fellows, the values showed with a margin of improvement regarding to the control group.

The dice, regarding the connection of the fellows between the test A against the test B (figure 01), They showed that the experimental group proposed a significant change in the test A against the test B to before and after the test, the same way in the control group, that they say the changes that was not observed in the control group. The changes that was observed in the experimental group regarding to the fellows that were skillful detecting the assignment in the testA as well It was in the test B after the intervention, this factor did not happen in the control group. The values of the control group in the analyzed experimental test with all the fellows when they started the disquisition showed that the loss from the fellows did not make a significant distinguished change in the correspondence between the test with or no memory of work, where the line got posotive and there's no a significant value. This factor comes to reinforce the support of the analyse from the dice that there wasn't a change inside the control group.

These results suggest that the intervention provoked a change in the dominion of the selective visual attention in the experimental group of origin top-down, however because the short space of time, these effects did not show a similar increase to the provoked for the connection top-down in the control group regarding to the test B. This delay in the assimilation of the process named top-down together to the selective visual attention is according to what Sunna & Zhangh (2004) showed about it, regarding the time of apprenticeship long necessary for this system whrn It was compared to the bottom-up; that It introduces a plasticity more agile. And they are also according to the introudced information for the disquisitions form Delorme & col (2004) and Sunna & Zhangh (2004), regarding the presence of neural bases in origin top-down in the cognitiva change in a demeanor.

Conclusion : The present disquisition, though of the obtained results, It concluad the following : a) the training of biofeedback is able to provoke changes in the system of selective visual attention, b) the changes happened with more importance in the selective visual attention with the utilization of the work’s memory, that It takes believing a large participation and plasticity of the top-down system of control in the selective visual attention, c) the training of biofeedback was able to provoke a change in the demeanor of the line between selective visual attention against no memory of work, It's showing a change in the demeanor of action in the attention.

Bibliography
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Este estudio tuvo el objetivo de investigar la aplicación de la técnica de biofeedback en la atención de los jóvenes atletas de fútbol. El estudio incluyó a los 20 sujetos del sexo masculino a la edad de 15 años, que fueron integrantes de un mismo equipo y que tenían más de 2 años de práctica, 2 horas de impulso al día y 1 de 2 juegos semanales. Estos...
temas se distribuyeron aleatoriamente en dos grupos: (G1) el grupo experimental y (G2) el grupo control. Se sometió a los dos grupos a la prueba de atención visual selectiva propuesta por Harris y Harris (1984). La atención visual selectiva de corta duración investigue con la memoria de trabajo (AVMT2) y sin la memoria de trabajo (AV2), la atención visual selectiva de larga duración también investigue con la memoria de trabajo (AVMTT) y sin la memoria de trabajo (AVT). Se realizaron siete intervenciones de 10 minutos en el período de 6 semanas por un programa informático nombrado "mentalgames" (Audiostrobe®). Su función es reproducir el estímulo en la pantalla de un ordenador encargado por la respuesta galvánica la piel (RGP) que ha sido reunida por el material ThoughtStream®. El juego estaba constituido por cuatro fases que deberían superse. El paquete estadístico BioEstat 3.0 se utilizó para analizar los datos. Para analizar el período de prado y post intervención, se utilizó la prueba no paramétrica de Wilcoxon. Los resultados del grupo experimental: para AVMT2 de 18,8+8,6s y 13,3 + 4,1s, para AVMTT de 8,9+1,8s y 6,7+1s, para AV2 de 24,5+8,3s y 18,5 + 12s y para AVT de 13,93+1,7s y 12,1+2,1s para el prado y la post intervención respectivamente. Sólo los valores de AVMTT presentaron la diferencia considerable entre el prado y la post prueba. Los resultados del grupo controlan: para AVMT2 de 13,1+3,2s y 13,9+5,8s, para AVMTT de 8,4+2,1s y 9+2,6s, para AV2 de 31,6+16,3s y 17,9+13,3s y para AVT de 14,8+7s y 10,9+3,9s para el prado y la post intervención respectivamente. Se encontraron de las diferencias en los valores del prado y la post prueba en AV2 y AVT. El análisis de correlación de Spearman demostró un cambio considerable en el comportamiento del grupo experimental entre el prado y la post prueba. El mismo resultado no se observó en el grupo controla. Según los resultados obtenidos, se concluyó que la técnica de biofeedback es capaz de modificarse y/o de desarrollar los procesos de atención visual selectiva.

Palabras clave: Biofeedback, Fútbol, Cognición y Atención.

O EFEITO DA TÉCNICA DE BIOFEEDBACK NA ATENÇÃO DE ATLETAS JUVENIS DE FUTEBOL DE CAMPO

Objetivo: investigar a aplicação da técnica de biofeedback sobre a atenção de atletas juvenis de futebol de campo. 20 sujeitos, masculino, 15 anos, integrantes de mesma equipe, treinamento diário de 2 horas e 1/2 jogos semanais. Distribuídos randomicamente: (G1) grupo experimental, (G2) controle. Utilizou-se o teste de Harris & Harris (1984). Investigou-se a atenção visual seletiva de curta duração com memória de trabalho (AVMT2) e sem memória de trabalho (AV2), e de longa duração com memória de trabalho (AVMTT) e sem memória de trabalho (AVT). Sete intervenções de 10 minutos, realizadas através de um software denominado mentalgames (Audiostrobe®), o qual consistiam em controle sobre um estímulo no computador, comandado através da resposta galvânica da pele (RGP). Para a análise entre pré e pós-teste utilizou-se o teste não-paramétrico de Wilcoxon. Os resultados do grupo experimental: para a AVMT2 de 18,8+8,6s e 13,3 + 4,1s, para a AVMTT de 8,9+1,8s e 6,7+1s, para a AV2 de 24,5+8,3s e 18,5 + 12s e para a AVT de 13,93+1,7s e 12,1+2,1s para pré e pós-intervenção, respectivamente. Apenas os valores de AVMTT apresentou diferença significativa. Os resultados do grupo controle: para a AVMT2 de 13,1+3,2s e 13,9+5,8s, para a AVMTT de 8,4+2,1s e 9+2,6s, para a AV2 de 31,6+16,3s e 17,9+13,3s e para a AVT de 14,8+7s e 10,9+3,9s para pré e pós-intervenção, respectivamente. Foram encontradas diferenças nos valores AV2 e AVT. A análise de correlação de Spearman demonstrou uma mudança significativa no comportamento apenas do grupo experimental do pré para o pós-teste. Conclusão: a técnica de biofeedback é capaz de modificar e/ou desenvolver os processos de atenção visual seletiva.