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POSITIVE STIMULUS: AN OPPORTUNITY FOR DECISION MAKING BY MEXICAN MANAGERS, A VISION FROM NEUROSCIENCE

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ABSTRACT

Nowadays, neuroscience has awakened a great interest in the scientific community and especially in what Organizational Cognitive Neuroscience is concerned, given that it allows the study of the brain activity of decision-making processes that organizational players carry out, when they face a diversity of factors, internal as well as those in their surroundings. This document compares the results obtained in a quasi-experimental exploratory investigation, of the type analytical-descriptive, with a cross-section in the time of the brain activity of a group of Mexican and American managers, monitored through electroencephalography during administrative decision-making, with and without a stimulus, finding differences between both groups in solving problems.

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INTRODUCTION

Decision-making forms part of the daily activities of a manager in an organization, who must carry out a process that starts from the identification of a problem or need, up to the election and execution of an alternative; a decision that he must face according to his hierarchical position and functions, that involve the administrative process and cover the planning, organization, direction and control.Besides understanding the situation that allows him to make the best decision, the manager must have the ability of analyzing, evaluating, gather alternatives and consider a variety of variables in order to find the most reasonable solution according to his circumstances. Therefore the decision-maker requires rational as well as creative abilities, that can lead the organization and other players involved to a better competitive position, whether local or global.While it is true that the topic of competitiveness has been evaluated, as an indicator of the decisions that are taken inside each country where they are taken, it is important to analyze how decisions are made by the people who make them.

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In this investigation the manager as the decision-maker, does a part of this, and therefore, it is convenient to compare how they do it in relation to another group, considered competitively successful.In this context, it is worth noting that neurosciences facilitate the development of a set of skills that aim at understanding the process of administrative decision-making that both group of managers, mexicans as well as north-americans carry out in order to solve a similar problem, through the analysis of a case study and thus compare both groups.In the first part of this document the literature review related to decision-making and neuroscience in particular is explained. In the second part the method chosen for this investigacion is described. In the third part the results obtained in both groups of managers, mexican and north-americans are shown, during the process of decision-making without stimulus, and with positive as well as negative stimulus. Finally, the conclusions and final reflections are presented, which point to inquiring further about this topic.

Literature reviewed

The theoretical perspective of the analysis of the decision-maker, indicates that a rational process is required, which allows him to address each of its phases, that ranges from the identification of a problem or need up to the election and

execution of an alternative from several options. The analysis that the decision-maker carries out on all the alternatives, must allow him to chose that which not only has the highest probability of implementation, but also the one that achieves the optimization of the resources to achieve the goals or objectives proposed in order to lead the organization to a better position.This rationality requires the detailed understanding of the options, which does not only require rational abilities but also creative abilities to achieve optimum results (Villegas, 1985, y Sicinski, 2008). Although the rational process of decision-making is catalogued as the "ideal process", in some instances some administrators or managers skip some phase of the process (Wharton, 2009). It should be noted that the Scientific Administration school proposed by Taylor (1961), together with the scholars of the classical theory of administration and the school of human relations among which stand out Mintzberg (1991) and Simon (1990), agree that the organizational orientation supports rationality provoking a work division among the members of a team and facilitating the process of those who carry it out according to their motivation (Crouzier y Friedberg,1960).

It should be pointed out that in many instances the available information is not enough or there is uncertainty in the particular environment of each organization as proposed by Burns, Stalker, Woodward, Lawrence y Lorsch, exponents of the theory of structural contingency who manifest that the organizational system finds itself immersed or integrated by other systems or open sub-systems adding to the complexity of decision-making which in turn is explained by theoreticians of systems such as Von Bertalanffy, Boulding, Wiener, Drucker, Köhler, Lotka, given that they express in some manner that the process of decision-making which managers face is a limited rational process, a situation defined by Simon (1990) as satisfactorily sufficient, that has to do with the choice of a satisfactory action and non-ideal, in which it is necessary to minimize the risks that prevent objective rationality, creating biases, which in turn are imposed on the facts up to the point of disregarding the environment of the future given the necessity of promptness of the decision; a situation mentioned by Crouzier y Friedber (1960) and Drucker in the work of Pfeffer (2000). Since creativity is a process that demands unconscious exploration or abstraction of a problem; it occurs by insight and out of the limits of conscience, that is to say, part of the dimension of intuition; this insight according to Sloan (1964) is a form of organizational decentralization, contrasting with the bureaucratic or structuralist theory of Weber which Mouzzelis explains in his work Organization and Bureaucracy (Mouzzelis, 1973).

Undoubtedly, there exist qualities that make decision-makers to be considered good or bad, such as: experience, capacity for analyzis and synthesis, creativity, power, leadership, attitude and responsibility to cite just a few; that is to say, qualitative and quantitative skills that facilitate the use of tools and/or available techniques and these are mentioned in the mathematical theory by Chiavenato (2007). Qualities that when added to factors such as environmental, political, economic, technological, social, legal and cultural, add to the complexity of the process of efficient decision-making (Cervantes, 2010), hindering the location and interpretation of the problem in a real context and at the same time the interaction between intuition, synthesis and analysis (Hall, 1983, 2005).It is worth noting that the intellectual intuition, emotional and volitional are products of the genetic perception and the social and cultural experience of the individual; in which the emotion and volition according to Batista (2006) are developed in the right brain hemisphere, which functions in a simultaneous manner, timeless, spacial and visual-auditive, permitting to think towards the future; while the intellectual is develop in the left brain hemisphere, which corresponds to the rational intelligence and thus requires a goal and a clear understanding of the alternatives which may present themselves, which is of a logical type, structured, numeric and functions in sequential and temporal mode (Wharton, 2009, Sicinski, 2008; Schuchny, 2011).And so managers require logical as well as creative thinking. With the aim of overcoming problems and challenges to which they are confronted, given that their field of action places them in an strategic position as operative and routine, and their inclinations towards one or the other depends on the hierarchical position they occupy or on the responsibility they have within the organization (Drucker, 2002; Simon, 1997 and Brousseau, 2008). At greater responsibility, greater uncertainty and risk, demanding different options that lead him to a decisional conflict; a process linked to pleasure in the nucleus acumbens, and danger in the amigdala (Cardona, 2011). In order to resolve such conflict he realies on the confidence he has at the time of his election, which is associated with experience and self-esteem (Laca and Alzate, 2004).

According to the research of Salgado (2011), American executives make decisions betting on intuition and not as a serious process and in addition to their daily activities it omits some phases of the process without following in an strict sense the path of rationality and calculation, which has been recognized by some of them. Fiol (2001) points out in his investigation that managers follow a limited rational process,giventhe great amount of aspects that must be considered, highlighting differences between latin-american and American managers, in which the latter take decisions in a short time, making the decisions without hesitation, sharing ethical rules, while the latin-americans skip phases in the process, applying succesful solutions obtained in past decisions, for which they build the context, that is to say, they make use of their creativity and employ more time; however, the results of the decisions of the investigation were similar for both groups.It is worth mentioning that the lack of analysis in decision-making leads to costly errors, therefore decision-making requires a space of time, in such a way that the right hemisphere provides the creativity and the intuition, and the left hemisphere carries out the relevant analysis pertaining to the information, with the purpose of choosing the best alternative in favor of the achievement of the goals of the organization.

In this respect Braidot (2013) demonstrates that through the neurosciences it is possible to study the brain activity during the process of decision-making, to study the chosen decision and apply it to the key processes, with the purpose of training the leaders that will lead the organizations successfully. According to previous investigations explained by Barea, Braidot and Gonzalez, among others, it is possible to measure the brain activity while decisions are made through the use of different instruments, given that such activity is a product of the sinapsis, which is the transmission of rapid and continuous information among neurons, which in turn form a network of circuits, called neuronal circuits, characterized by emitting a chemo-electrical activity, and which give rise to different regular rhytms localized in specific groups of neurons, whose

axons project into identifiable brain regions (Iversen, 1979). According to Samper (2011), the neuronal activity is a product of the interpretation of the external world, the internal life of the human being and the integral functioning of all the organs in the body and their mental functions (Geffner, 2011y Escamilla, 1999).The measurement of brain activiy by means of electroencephalography is one of the most employed techniques, given that it is non-invasive like other techniques are, and it has the advantage of low cost and speed in its results. Such measurements are performed over the scalp through electrons in the form of buttons, as a reflection of the bioelectrical activity or impulses; it is a technique which has recently incorporated the use of a mesh helmet that facilitates taking the sample (Kolb & Whishaw, 2006).

Depending on the intensity and the area where impulses are generated, the difference in potentia between two continuous electrodes is recorded; a signal that is subsequently amplified, filtered and digitized, in order to be finally visualized in a computer monitor. The electrical rhythms and isolated activities differ by their location, frequency, periodicity and functional properties (Gonzalez, 2014) and are identified by a greek letter according to such characteristics. According to the frequency or speed of the impulse and the ampltude or voltage of the impulse, it is possible to identify the part of the brain that is utilized at a particular moment, facilitating the identification of the brain wave, its amplitud in milivolts and in turn it allows the follow up of the process of administrative decision-making among mexican and north american managers, as well as its similarities or differences. The characteristics of the rhythms Delta, Teta, Alfa and Beta may be observed in Table 1, as well as the region and time of occurrence in the decision-maker, given that when recorded simultaneously they differ among them and reflect different cognitive processes (Ventura, 2014, 2015).

responsible for the cognitive and rational functions, and the dorsolateral brain cortex. On the other hand, Lee *et al* as explained by Balleire (2007) demonstrate that the lateral, medial and ventral subregions have the task of performing predictions of the future value rewards, which coincides with Basten *et al* (2010) who found that through a functional magnetic resonance analysis, the decisions are accumulated in the parietal cortex due to the difference of the cost-benefit value (Hsu *et al*., 2005), explain tht the most active region in decision-making in an ambiguous situation is the orbitofrontal cortex, an area implicated in the integration of emotion and knowledge and which when faced with a situation of risk the prefrontal dorsomedial cortex intervenes, which modulates the activity of the amigdala. For his part, Braidot (2008,2009) expresses that the brain at the time of making deccisions generates a great activity at the prefrontal region, medial anterior, and medial posterior, provoking a connection of intention-action, which activates the amigdala which is implicaated in reasoning, employed when faced by important decisions.

Tardón (2009) claims that the prefrontal cortex and especifically the prefrontal lobe, plays an important role in the correct decision making, this zone is related to memory, which centers its function in short term and long term learning and shows the greatest activity when dealing with successes in the decisions.In a nutshell and according to De la Barrera and Donolo (2009), the central task of neuroscience is to try to explain how millions of nerve cells act in the brain in order to produce behavior and how these are affected by the environment, giving answers to the actions of people, and through the detection of activity in the prefrontal zone, and the middle of the brain, zones attributable to solving problems, it is possible to explain certain processes, such as is the case in the process of administrative decision making.

Table 1. Characteristics of brainwaves

Wave	Frequency (Hz)	Voltage (mv)	Brain region	Observation
Deltha (δ)	0.1 - 4	10 - 50	Mainly in the hemisphere right.	Babies. Deep sleep Meditation. Processes of memorization.
Theta (ϕ)	4 – 8	50 - 100	Temporary left and right.	Children and adults asleep. During process cognitive.
Alfa (α)	8 – 14	100 - 150	They predominate in parietal and occipital areas.	Relaxation. Mental concentration. Creativity.
Betha (β)	14 – 30	150 –200	Present in the frontal and central regions.	Adults waking. Alerta máxima. Fier. Anxiety. Attention moments. Panic. Problem resolution

Source: Taken from Vallejo (Vallejo , 2015: 36)

According to Boorman *et al* (2013), making binary decisions reflects in the brain an important activity in the prefrontal ventromedial and dorsomedial zone and as the decision alternatives increase, so does the activity in the prefrontal ventromedial zone, and the activity in the dorsomedial zone decreases; manifesting also that the activity in the prefrontal ventromedial zone arises gwhen short term choices occur, while the dorsomedial zone is involveed in long term decisions. In his investigations, Chang *et al* (2011) conclude that the expectations may create a bias in decision-making, product of the conflict that is generated in the brain by the preferences of the individual and social norms, giving rise to great activity in the insula and the anterior cingulate cortex,

Description of the Method

According to Popper (2005), the quantitative investigation has the advantage in starting from the identification and delimitation of the problem, it is possible to observe de incidence between the elements that make it up, given that it permits the study of the phenomenon from the numeric field for its interpretation. It is in this way that the investigation was carried out from the positivist perspective, under the modality of an exploratory investigaction, quasi experimental, of analytical-descriptive type, with a transversal study in time.
Under this perspective and with the help of an electroencephalogram-EEG digital computerized brand Vector

PSG with 20 electrodes and 32 channels, operating with a sensitivity of 10uV/mm and a speed of 26.5 mm/sec, with an amplifier brand BIOSCIENCE, connected with optical fiber, which registered the brain activity in a computer brand DELL, operated by the computer software STELLSYSTEM v 5.1; to each of the managers was placed a helmet over the scalp with 22 electrocap electrodes and conducting gel brand eci.electro-cap international, inc.; facilitating the measurement of brain activity of the managers during the process of administrative decision making with the orientation of Olmos (2014 and 2015).

The measurement reflected by the intensity of the signals from the prefrontal and central zones of the brain, were identified as the managers were solving a problem, as explained in a study case.The protocol developed by Ventura (2013) and modified specifically for this investigation was followed; this modification consisted in monitorin the administrative decision making by the subjects under investigation in three moments: the first without stimulus, the second with a positive stimulus and the third with a negative stimulus; which were provoked by audiovisual means.

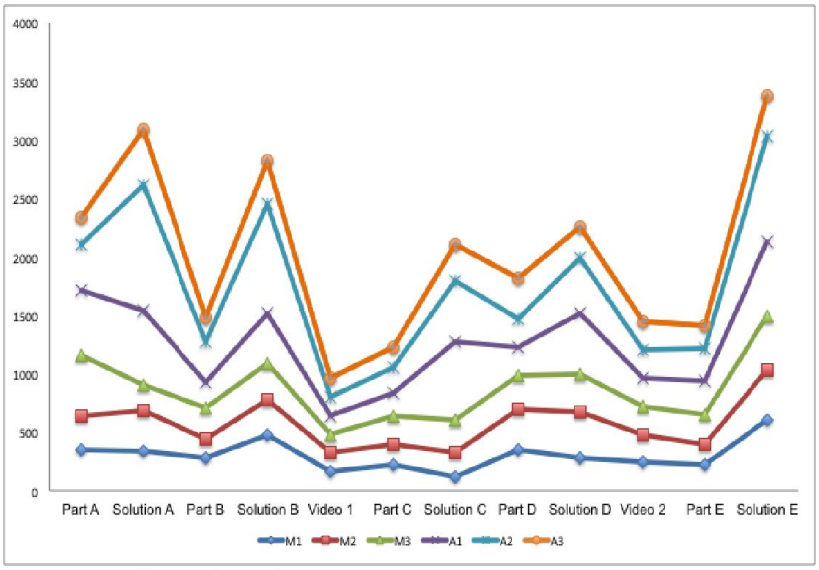

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Figure 1. Time Test managers in seconds

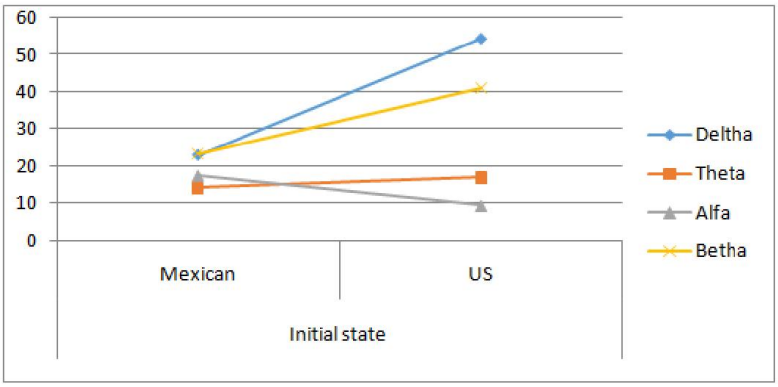

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Figure 2. Behavior of averages brainwave groups management at administrative decision-making without stimulus or initial state

Table 2. Statistical brainwave groups management at administrative decision-making without stimulus or initial state

Statistical		Groupmanagement	Initial state			
Name	Rank		Deltha	Tetha	Alfa	Betha
Average		Mexican	23.174	14.171	17.414	23.414
		US	54.346	16.933	9.489	41.132
Median		Mexican	23.040	14.450	11.010	14.620
		US	26.360	11.520	4.580	28.070
Standard deviation		Mexican	10.821	4.954	8.659	5.102
		US	9.677	3.282	2.636	12.332
Shapiro-Wilk	more of 0.5	Mexican	0.808	0.983	0.872	0.908
		US	0.871	0.915	0.801	0.954
Cronbach	more of 0.6	Mexican	0.887	0.986	0.973	0.993
		US	0.998	0.996	0.993	0.985
Pearson correlation	more of 0.5	Mexican	57%	99%	100%	100%
		US	100%	100%	100%	96%
Intraclass correlation for only measures	more of 0.5	Mexican	0.293	0.789	0.658	0.888
		US	0.965	0.937	0.875	0.778

Source : Prepared in Excel 2011 for Mac.

The findings made by Ventura (2013) served as the basis to define the size of the sample, which had as a restriction that the size were determined up to the number of managers in which the conclusions of the group of mexicans were similar or coinciding to theirs and taking an equal number of northamerican managers for their comparison; it is worth noting that there exists the Heisenberg principle or uncertainty principle or indeterminacy, according to which it is impossible to simultaneously measure and with absolute precision the subjects under study (Ventura, 2013).According to Jimenez (2013), the independent variable is conceptualized as the cause or reason of the phenomenon to be investigaded, which for this investigation were several: time, type of wave and absolute and relative frequency of the brain waves and the dependent variable was identified as the effect generated by the manipulation of the independent variable, that is to say, the administrtive decision making.The data of the results of the study variables in this investigation in relation to the phenomenon of administrative decision making of the mexican and northamerican managers were analyzed by the statistical package Statisticl Package for the Social Sciences-SPSS, version 22 for Mac; *by which* the descriptive and inferential statistics of the two groups of managers was analyzed, reporting: arithmetic mean, standard deviation, variance, covariance, test of normality according to Shapiro-Wilk, correlation coefficient of Pearson, Alfa of Cronbach, Test of Levene, and the test of ANOVA.In particular, both the test of Levene as well as the ANOVA test allowed to carry out a better comparison of the brain activity of the two groups of managers (Correa, Iral & Rojas, 2006).

RESULTS

The occupational sociodemographic data, allowed the placement of the subjects under study according to characteristics such as genre, age, position, activity of the business, ´length of service in the position and number of employees under their responsibility.In relation to them it is shown that the group of mexican managers have an average age of 47 years, a lenght of service in the position of six years and have 56 employees in their staff; while the group of northamerican managers have an average age of 43 years, a length of service in the position of fifteen years, and 75 employees in their staff. Eighty three percent of the six managers subjects in the study, three mexicans and three northamericans are employed in a service industry and their positions range from Director to President.

Time

For the solution of the study case in Figure 1, it is observed that the northamerican managers required more time to make administrative decisions, tendency lines A1, A2 and A3, than the mexican managers, tendency lines M1, M2 and M3. To this respect mexican managers used in average 58 minutes, while the northamerican managers required 88 minutes as an average, that is to say, 52% more time than that required by the mexican managers for the solution to the study case.

Type of wave and frequency

The brain activity of each manager monitored during the process of administrative decision making while they solved the study case and according to the research protocol, it is explained in an independent manner for the three moments: initial state, with positive stimulus and negative stimulus.

Initial state

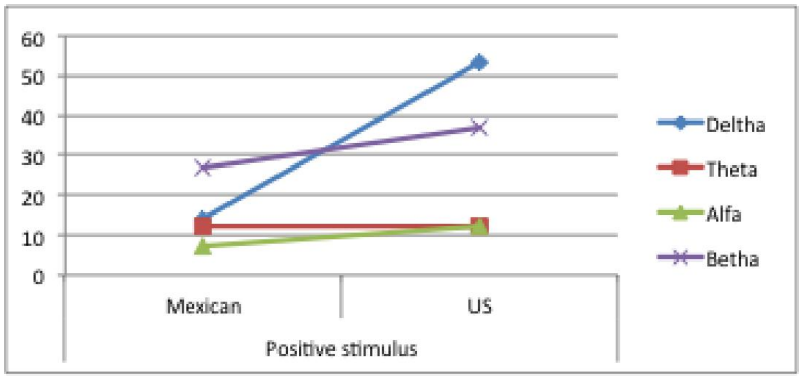
It refers to the period in which they solved Part A and B of the study case. In general the groups of managers presented heterogeneous activity in the initial state with an average of activity for the group of northamericans in Deltha waves with 54 Hz and Betha with 41 Hz, the group of mexicans present higher activity in Alfa waves with 17 Hz and in relation to the Theta waves there was no significant difference in the average of the two groups, see Figure 2, indicating that the mexican group presents higher creative mental concentration, while the northamericans present cognitive processes, memory, logic and reason.As for Pearson correlations, only differences within the group of Mexicans in Deltha waves correlations were observed in 57 percent of its activity; in other high Pearson correlations waves without significant differences between each group they were observed. Intraclass correlations with the unique measurements, obtained from the measurement of each of the electrodes 22, it can be inferred that the initial state statistically results are consistent with the descriptive statistics, see Table 2.

Positive stimulus

It refers to the period in which they solved Part C and D of the case study after the positive stimulus through the presentation of the audiovisual “strong sex scenes between Gonzalo Heredia and Romina Gaeta”.In general, the activity of the northamerican managers presented in average higher activity in Deltha waves with 53 Hz, Alfa with 12 Hz and Betha with 37 Hz, without significant difference in the average of the Theta waves between the two groups, emphasizing that the mexican managers presented a reduction in the brain activity in all the waves except in Betha, which increased an average of 22 Hz without stimulus and 28 Hz with a positive stimulus, see Figure 3.The above indicates that during the process of decision making measured during the resolution of a study case and positive stimlus, the group of northamericans involve cognitive processes, of memory, logic, reason and creativity, given that their activity does not present variations, while for mexican managers there are variations, increasing their cognitive processes.As far as the Pearson correlations are concerned, none of the two groups presented significant differences between them in the percentage of activity of the Deltha, Theta, Alfa or Betha waves. Regarding the intraclass correlations it is possible to appreciate that for the mexican group it is high in Betha, while for the northamericans it is high in Theta, Alfa and Betha, see Table 3.

Negative stimulus

It refers to the period in which Part E of the case study was solved after the negative stimulus through the presentation of an audiovisual “the most difficult decision”. In general it is observed in Figure 4, that the group of mexican managers present higher activity in Alfa waves with 13 Hz on average, while the northamericans presented on average higher activity in Betha waves with an average of 39 Hz, without significant differences between the two groups in relation to the Deltha and Theta waves.Regarding the Pearson correlations, none of the two groups presented between the two significant differences in the percentages of activity of the waves Deltha, Theta, Alfa or Betha. Concerning the intraclass correlations, it is possible to appreciate that for the group of mexican managers in Betha was 0.813 and in the other waves, Alfa,



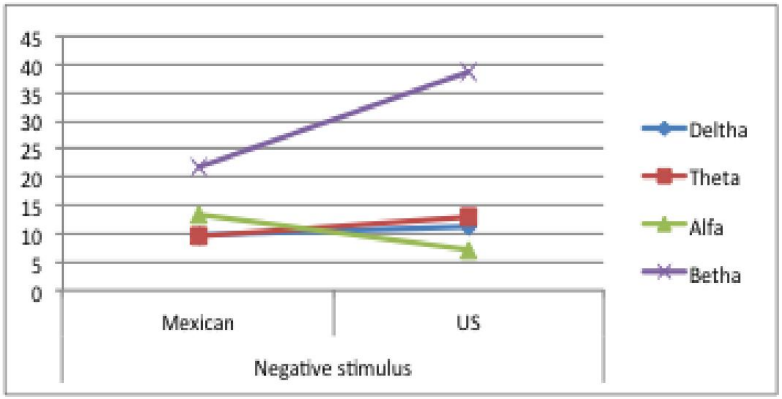
Source : Prepared in Excel 2011 for Mac

Figure 3. Behavior of averages brainwave groups management at administrative decision-making with positive stimulus

Table 3. Statistical brainwave groups management at administrative decision-making with positive stimulus

Statistical		Groupmanagement	Positive stimulus			
Name	Rank		Deltha	Tetha	Alfa	Betha
Average		Mexican	14.074	12.251	7.128	26.887
		US	53.251	12.025	12.466	37.231
Median		Mexican	12.160	10.070	6.500	22.550
		US	13.440	8.350	3.480	22.070
Standard deviation		Mexican	6.312	4.288	2.219	7.752
		US	11.909	3.761	4.160	19.821
Shapiro-Wik	more of 0.5	Mexican	0.876	0.934	0.913	0.830
		US	0.777	0.938	0.773	1.000
Cronbach	more of 0.6	Mexican	0.56	0.955	0.957	0.961
		US	0.998	0.989	0.994	0.942
Pearson correlation	more of 0.5	Mexican	78%	92%	90%	73%
		US	100%	98%	100%	82%
Intraclass correlation for only measures	more of 0.5	Mexican	0.63	0.525	0.541	0.566
		US	0.964	0.829	0.892	0.462

Source : Prepared in Excel 2011 for Mac.



Source : Prepared in Excel 2011 for Mac.

Figure 4. Performance of averages brainwave groups management at administrative decision-making with negative stimulus

Table 4. Statistical brainwave groups management at administrative decision-making with negative stimulus

Statistical		Groupmanagement	Negativ stimulus			
Name	Rank		Deltha	Tetha	Alfa	Betha
Average		Mexican	9.801	9.588	13.419	21.637
		US	11.196	12.779	7.176	38.678
Median		Mexican	6.590	6.690	12.440	11.970
		US	12.340	4.090	5.860	23.390
Standard deviation		Mexican	4.229	3.161	6.950	6.496
		US	3.931	3.638	2.477	14.885
Shapiro-Wik	more of 0.5	Mexican	0.84	0.855	0.998	0.783
		US	0.925	0.799	0.996	0.964
Cronbach	more of 0.6	Mexican	0.967	0.97	0.965	0.988
		US	0.949	0.995	0.982	0.987
Pearson correlation	more of 0.5	Mexican	90%	88%	98%	100%
		US	88%	100%	91%	94%
Intraclass correlation for only measures	more of 0.5	Mexican	0.609	0.627	0.658	0.813
		US	0.495	0.916	0.74	0.801

Source : Prepared in Excel 2011 for Mac.

Deltha and Theta with an average of 0.6; while for the group of northamericans it was of Theta in 0.916, Alfa in 0.74 and Betha in 0.801. The above indicates that with a negative stimulus, the mexican managers did not present activity in the temporals and the northamerican managers did not present activity in the region front polar and right temporal, see Table 4.However, it may be appreciated that with a negative stimulus there is a decrease in the brain activity for both groups of managers, except for the northamerican managers that on average keeps them with reference to the decision making without stimulus or in the initial state, that is to say, they keep solving problems inspite of the negative stimulus.

Conclusions

The Deltha waves show evidence of memorization activities, according to the averages, in the three moments, in its case, the northamerican managers show greater brain activity in this respect than the mexican managers, decreasing their proportion to 14 percent with negative stimulus and doubling its proportion with positive stimulus. It is important to point out that with negative stimulus, this activity drops in an important way for the northamerican managers. The Betha waves reveal resolution of problems, which present themselves with a 76 percent greater intensity in the initial state in the northamerican managers compared to the mexican managers. The decision making with negative stimulus presented a similar behavior. With 79 percent greater activity in the northamerican managers. In regards to the positive stimulus, the proportion decreased while mantaining the relationship. The Theta waves are present during the cognitive processes, according to the results of the averages, it is observed that during the initial state and negative stimulus, the group of northamerican managers present a greater activity than the mexican managers. According to the theoretical proposals this indicates that there is a geater connection reason-intuition for the northamerican managers. With positive stimulus there was no significant differece between the two groups for this wave. From the descriptive and inferential analysis of this investigation, it may be concluded that there are differences in the utilization of the brain zones of the two groups of managers, the mexicans and the northamericans, during the process of administrative decision making.

That the mexican managers, while solving the case, registered displacements from the occipital region to the parietal and temporal left with positive stimullus and the northamerican managers mantained ther activity during the resolution of problems inspite of the perturbations. The averages of the brain waves for each group of managers showed that the differences in brain activity between the groups of managers, in which under a positive stimulus the mexicans decreased their concentration and creativity, however, their capacity for solving problems increases, contrary to the northamericans who did not present any significant modifications regarding the resolution of problems under a positive stimulus. With a negative stimulus, the concentration in administrative decision making and especifically for the resolution of problems in average does not change for the northamericans, while it decreases for the mexicans. The ANOVA test, measured by the intraclass correlation for single measures was utilized to select the electrodes that influenced the administrative decision making, based on the significance of the statistic F and show that for the administrative decision making, the mexican managers have a higher influence of the right hemisphere during the three moments, while in the case of the northamericans, activity is observed in both hemispheres.

Concluding thoughts

In synthesis, different authors explain that according to the investigations in neuroscience, it is possible to relate the predominant brain activity in the individual, and between the functions this must carry out in the organization, with the purpose of forming teams optimizing the role they play, according to this the quantitative analysis ratifies what was expressed by Braidot (2009), who proposes that it is possible to impact on the brain of the administrative decision maker through training, given that this investigation demonstrates that there are responses to the perturbations in both groups, just as much with the negative as the positive stimulus. According to the investigation, the positive stimulus achieved an increase in the brain activity of the Betha waves in the mexican managers, up to 15 percent, an incentive to widen this field of investigation.

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