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Metalanguage and sensory sub-modalities in mental training techniques through neurolinguistic programming

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Abstract

Introduction and theme actuality: this study is part of a larger work, which involves increasing sporting performance by applying mental training techniques, special techniques of neurolinguistic programming (NLP). *Purpose of study and hypothesis:* if ideomotor representations of athletes are completed with multiple sensations of all sensory sub-modalities such as visual, auditory, kinaesthetic, olfactory and gustatory, the possibility of applying the techniques of NLP will have more effective results. We have studied the relationship between sensory sub-modalities, in accordance with the Bandler and Thomson (2012) and application of Jacobson (2011). *Methods and material:* two records were made by using two tests, test 1 and test 2, on master students of the 'Babes-Bolyai' University Cluj-Napoca, from the Faculty of Physical Education and Sport. The statistical indicators were calculated on elements of descriptive statistics and the data are presented using indicators of centrality, location and distribution. Statistical analysis of the non-parametric Wilcoxon test was used for sample pairs. *Discussions and findings:* to pinpoint the correlation between the two variables, we used the Spearman rank correlation coefficient (ρ). Statistical analysis was performed using the correlation coefficients of Colton's rule. No statistically significant differences were found ($p > 0.05$) in the statistical analysis because of the short timeframe, but there are many good and very good correlations at both tests, between the values of the items studied. *Conclusions and recommendations*: we want to continue with this study because the time difference between T_1 and T_2 was 3 months and we want to extend this study to a minimum of 6 months. All sensory sub-modalities are particularly important in achieving ideomotor representations underlying mental training.

Keywords: Idiomatic representation, neurolinguistic programming, sensations, sensitive sub-modality, mental training.

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1. Introduction

Metaprogrammes appear to have a more robust basis to psychological validity and reliability than more general conceptions of learning style – the effectiveness of which is widely disputed (Davis, 1988).

This study is part of a larger work, which involves increasing sporting performance by applying mental training techniques – special techniques of neurolinguistic programming (NLP). In this case, we will discuss some aspects of Bandler & Thomson test application (2012) and Jacobson's test (2011).

Examining, in particular, the phrase 'NLP', we can define the following concepts: 'programming', which researchers say that our minds are closed patrimonies of programmes that can be modified. 'neuro' these programmes will be systematised in a way to become neural configurations. Moreover, 'neuro' refers to the mutual influence ways between physiological indices and the internal state of the body. Neuroscience confirms that each cerebral hemisphere is highly specialised to develop various functions to manifest different abilities and generate different styles of thinking (Bandler & Thomson, 2012).

'Linguistics' was defined as language belongs to our system of communication with others through accurate language, and we can extract limits that are blocking our thinking from the targets (Fanelli, 2010). Programming refers to the models and programmes of behaviour and thinking that we follow to produce specific results (Garrat, 2012). Vince Lombardi, a famous Italian football coach said, 'defeating is not everything but wanting to defeat yes', phrases that have entered in sports legend, highlighting the sport model that we want to train.

To work specifically on mental training is important to clarify from the beginning the concept of sub-modalities from NLP. Before addressing the topic of sub–modalities, we have an obligation to clarify the concept of modality. Modalities relate to representational systems such as visual, auditory, kinaesthetic, olfactory and gustatory. Sensory sub-modalities clarify specific aspects of the five senses. For example, in visual, we have aspects of lighting intensity, the presence or absence of colour and intensity. In the same way, we manage other aspects related to sensory channels.

We begin this study by pinpointing that there are no two identical persons, though they may be equal, from all points of view. The reason is that our experiences are different and our reactions to these experiences are diverse. In this way, we are offered supportive perspectives in relation to the potential of NLP in education in the areas of language and learning (Eckstein, 2004).

Communication is important to understand, which is the preferred representational system of our part, so we can adopt a personal style to communicate effectively. For example, if the athlete is stimulated by the visual channel, it should be used more slides and images that increase the level of attention. If he prefers the auditory channel, we will have a long conversation with him; if he prefers the kinaesthetic channel, we will have to ask athletes to follow specific topics. Once defined the concept modality, we can examine what are the sub-modalities. These relate to how modalities are represented in athletes mind. Sub-modalities represent the quality that characterises each singular experience (O'Connor & McDermott, 2009).

We perceive reality through five senses such as tactile, olfactory, gustatory, visual and acoustic. In a subjective manner, we tend to use one sense more than the others. Some persons focus too much on the way they dress, they combine colours and they are concerned by their appearance; in exchange, others pay very much attention to the words they use, while others yet 'are into sensations'. NLP tends to individualise representational systems based on what a person prefers: V – visual, A – auditory, K – kinaesthetic (Fanelli, 2010, p. 92) or tactile, olfactory and gustatory.

For instance, we would ask an athlete to describe his own image mentally, by specifying the size of the image, whether it is bright, whether it has a frame, vivid or pale colours, whether sounds or sensations are associated with the image. This distinction between feeling and thinking clearly

distinguishes a controlled, conscious act from a non-controlled one. Thinking an act means emitting energy, whereas feeling it means receiving energy (Vittoz & Godefroy, 2001, p. 45). The athletes must get into the habit of looking clearly at what they are seeing, of listening to what they fear and of feeling what they do.

According to Draeger (2013, p. 42), the four pillars of mental toughness are as follows: setting goals, mental visualisation, positive self-talk and arousal control. For setting goals, Navy (2013, p. 29) shows a technique how was used in which students established short-term, mid-term, long-term goals for themselves throughout the courses. Mental imagery is used by students prior to other training evolutions, such as timed runs of the obstacle course.

For a quick overview of this model concerning 'the subjective structure', we follow the way in which we optimise the nervous system (neurology and brain) to elaborate 'the model', which creates, in its turn, our subjective system through which we analyse reality and form sensations (Bondenhamer & Hall, 2012, p. 28). Our central nervous system receives outside information only through our senses. Therefore, we use these sensory pathways of awareness to elaborate information (thoughts) and to store it (memory). NLP defines these modalities as systems of representations, though for half of the people, outside information is related to the experience and information of the past, to what they have seen, heard and felt.

When referring to representational systems, we will adopt the following abbreviations for the following levels: (Bondenhamer & Hall, 2012, p. 29): V – visual (images, visions, visual representations); A – auditory (sounds, noises, volume, tones); At – auditory and tonal (sounds); K – kinaesthetic (sensations, feelings); O – olfactory (smells); G – gustatory (tastes); M – motor (for kinaesthetic movements). Besides the aforementioned primary representational systems, which provide us awareness modalities, there is another representational system pertaining to an immediately higher logical level related to sensory systems language. This symbolical system of words, sentences and phrases allows us to speak about our images, sounds and sensations and to summarise them at a higher logical level, which leads to a meta-representational system.

A controlled action must be 'conscious', which means that athletes must be absolutely present and concentrated on what they are doing. This should exclude all distractions from interfering. That is the first point. The second important point is the following: during a conscious act, the brain must be uniquely receptive; its function is to record precisely what is taking place (Vittoz & Godefroy, 2001). Within the representational systems and the meta-representational system of language, aspects refer to quality, to the characteristics of modality components, which are sub-modalities, in such a way that each system has its own list of sub-modalities. For instance, there are different examples in visual sub-modalities such as position: close/far; size: small/large; structure: 3D or 2D or flat; inside/outside: associated, dissociated; movement: slides/film and luminosity: high/basal. Similarly, auditory or kinaesthetic sub-modalities can be described.

2. Purpose and hypothesis of the study

In NLP, we have studied the relations between sensory sub-modalities by applying the Jacobson S. test (2011) and Bandler & Thomson test (2012) from NLP, see Tables 1 and 2 for test application and a comparative analysis of the results and statistical significance (pair sample in the two testing T1 and T2).

Students filled in the tests with keywords that describe the sensations and perceptions of the representation of a motor act. The motor act represented by each student is a sport-specific motor skill practice and is used in mental training. The words chosen by students who completed the tests can provide information about the precision and accuracy of representations of mental training movements FEFS students. There were two entries such as T1 and T2 at 120 days (October–December 2013).

We sought to assess the significant degree of the difference of means for the parameters studied and to determine whether the resulted significance threshold ranges within objective parameters. If the athletes' ideomotor representations are completed by multiple sensations of all sensory sub-modalities such as visual, auditory and kinaesthetic, then the possibility of applying NLP techniques will have more effective results. In the context of set goals, there are long-term and short-term objectives (Jacobson, 2009, p. 84). Self-talk must be positive and constructive with a significant and highly desired personal or professional goal, objective, prize, achievement or form of recognition.

3. Material and methods

Students have completed the Jacobson test by keywords that describe sensations, perceptions from representing a motor act. The motor act can be an exercise, defined by Stuart and contributors as a subset of physical activity that is volitional, planned structured repetitive and aimed at improvement or maintenance of an aspect of fitness or health (Biddle, Fox & Boutcher, 2002). The motor act represented by each student is a specific motor skill of sport and is used in mental training. Keywords chosen by the students, which were completed in tests, can give us information about the precision and accuracy of the movement representations in mental training in FEFS students. There were two records such as T1 and T2 after 30 days. During this time, they made ideomotor representation training and autogenic training. Through these autogenic training techniques, we have attempted to create an inner balance (Mauti, 2012). Two records were made by using two tests, test 1 and test 2, on master students of the 'Babes-Bolyai' University Cluj-Napoca from the Faculty of Physical Education and Sport within the department 'Training and sports performance' (Tables 1 and 2).

Table 1. Statistical results recorded after applying the two trials test Bandler R & G. Thomson

Test/Item	Moment	Media	ES	Median	DS	Min.	Max.	Statistical signification (*p*)
Test Bandler R. & Thomson G.	T1	29.50	3.7966	27.5	17.8078	0	65	0.7854
	T2	31.23	5.2541	40.5	24.6440	0	68	
Visual sensations	T1	12.59	1.5397	12.5	7.2221	0	25	0.7854
	T2	13.14	2.0747	17.5	9.7311	0	25	
Auditory sensations	T1	9.55	1.3544	8	6.3526	0	20	0.8987
	T2	9.23	1.6540	10	7.7578	0	20	
Kinaesthetic sensations	T1	7.36	1.4867	6	6.9730	0	21	0.3535

The table comprises the values of the mean, the median and the standard deviations at the two tests as well as the statistical significance with high values for kinaesthetic sensations and good values for recorded at the two tests with maximum, median and minimum.

Table 2. Comparative analysis values studied tests and test items and statistical significance (paired-samples)

Test Items	Moment	Media	ES	Median	DS	Min.	Max.	Statistical signification (*p*)
Test Jacobson	T1	54.91	8.0531	59.5	37.7724	0	137	0.187
	T2	72.18	12.5202	77.0	58.7251	0	177	
Visual sensations	T1	19.77	2.5507	20	11.9640	0	43	0.4628
	T2	22.95	3.8716	27	18.1593	0	54	
Auditory sensations	T1	15.64	2.0895	17	9.8006	0	32	0.2877
	T2	20.95	3.6801	26.5	17.2612	0	51	
Kinaesthetic sensations	T1	14.55	2.6966	13.5	12.6481	0	42	0.1327
	T2	21.50	4.1125	23	19.2892	0	61	
Olfactory/gustatory sensations	T1	4.95	1.2475	2	5.8511	0	20	0.2744
	T2	6.77	1.5831	3.5	7.4254	0	18	

Table 3. Results at test Bandler R. & Thomson G. After testing T_1 and T_2

	Test Bandler R. & Thomson G.	
	Test 1	**Test 2**
Maxima	24.50	16.25
Q3	13.00	11.25
Medians	6.25	40.50
Q1	21.25	0.00
Minima	21.25	0.00

In terms of statistical indicators, we calculated elements of descriptive statistics and the data are presented using indicators of centrality, location and distribution. Statistical analysis of non-parametric Wilcoxon test was used for sample pairs (data uneven distribution/rank). Materiality tests used were $\alpha = 0.05$ (5%), $\alpha = 0.01$ (1%) or $\alpha = 0.001$ (Tables 3 and 4).

Students filled in the tests with keywords that describe the sensations and perceptions of the representation of a motor act. The motor act represented by each student is a sport-specific motor skill practice and it is used in mental training. The words chosen by students who completed the tests can provide information about the precision and accuracy of representations of mental training movements among the Faculty of Physical Education and Sport students.

Table 4. Results on the category of sensations at Bandler R. & Thomson G. test

	Test Bandler R. & Thomson G.					
	Visual sensations		**Auditory sensations**		**Kinaesthetic sensations**	
	Test 1	**Test 2**	**Test 1**	**Test 2**	**Test 1**	**Test 2**
Maxima	8.25	4.25	4.25	4.00	8.50	7.25
Q3	4.25	3.25	7.75	6.00	6.50	6.25
Medians	2.25	17.50	2.75	10.00	5.00	9.50
Q1	10.25	0.00	5.25	0.00	1.00	0.00
Minima	10.25	0.00	5.25	0.00	1.00	0.00

Two tests were conducted such as T1 and T2 at 120 days. For the three sensations, see Table 4 and the comparisons between the categories of sensations. The median with very good values 17.50 was obtained at the second test for visual sensations. Churches and West-Burnham (2008, 2009, 2010) suggest that NLP tools and techniques relevant to teachers and school leaders can be classified in four ways such as outcomes, rapport, flexibility and language.

4. Discussions and findings

We have results on three categories of the most important sensations, such as visual, auditory, olfactory, kinaesthetic, on the Jacobson test, on the two tests and experimental group. In realising ideomotor representation, all sensory sub-modalities are important and underlay the mental training. Keywords help trigger the action in movements. In Table 5, we have the values after applying the Jacobson test and accent on maxima, medians and minima in sensory sub-modalities.

Table 5. The value of total sensations after apply Jacobson's test

	Test Jacobson	
	Test 1	**Test 2**
Maxima	60.00	60.00
Q3	17.50	40.00
Medians	33.50	77.00
Q1	26.00	0.00
Minima	26.00	0.00

All sensory sub-modalities are very important in realising ideomotor representations, which emphasise the mental training. In Table 6, we have different sensations of values after applying the Jacobson Sid test in all four groups of sensations, both the tests. Median value is at his maximum level, 27, in visual sensations and for auditory sensations, 26.50, which underlines the importance of these sensations in ideomotor representations from mental training. We also have null (0) values due to the absence of some students in testing no. 2.

Table 6. The value of different sensations after apply Jacobson's test

	Jacobson S.							
	Visual sensations		Auditory sensations		Kinaesthetic sensations		Olfactory/gustatory sensations	
	Test 1	Test 2	Test 1	Test 2	Test 1	Test 2	Test 1	Test 2
Maxima	13.25	18.75	9.00	16.50	17.50	26.25	11.25	3.00
Q3	9.75	8.25	6.00	8.00	11.00	11.75	6.75	11.50
Medians	7.50	27.00	9.00	26.50	10.25	23.00	2.00	3.50
Q1	12.50	0.00	8.00	0.00	3.25	0.00	0.00	0.00
Minima	12.50	0.00	8.00	0.00	3.25	0.00	0.00	0.00

In the Jacobson test, statistical correlation analysis for the studied items showed (see Fig. 1): a very good correlation and in the same sense between SV – SA (visual–auditory), see Figure 2, underlying moment T_1 and Figure 4 for moment T_2: SV – SK (visual–kinaesthetic), see Figure 3, moment T_1, and Figure 5 for moment T_2; SV – SOG (visual–olfactory, gustatory), SA – SK (auditory–kinaesthetic) and SK – SOG (kinaesthetic–olfactory, gustatory). A good correlation and in the same sense was found between SA – SOG (auditory–olfactory, gustatory).

If we manage to teach our students personalised relaxation and concentration techniques, then even in most difficult moments they will be able to create their own wellbeing and increased self-esteem (Brugnoli, 2005). To pinpoint the correlation between the two variables, we used the Spearman rank correlation coefficient (ρ). Statistical analysis was performed using the correlation coefficients of Colton's rule. No statistically significant differences were found ($p > 0.05$) in the statistical analysis *of sample pairs* Jacobson test values *(times* T_1–T_2*)* because of the short timeframe – just 1 month – for objective reasons, but there are many good and very good correlations at both tests, between the values of the items studied.

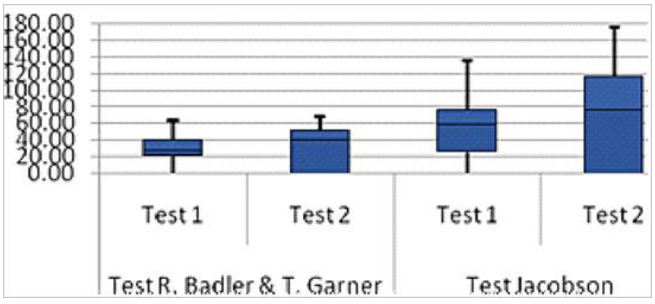

Figure 1. Comparative Testing 1 and 2 at Bandler R. & Thomson G. and Jacobson S., tests

We focused on results recorded on the three major categories of sensations such as *visual*, *auditory* and *kinaesthetic* applied to the students within the experimental group for the Bandler & Thomson test and for the Jacobson test, which we discussed in other studies. For ideomotor representations, all sensory sub-modalities are particularly important, and they are the basis of mental training. Keywords help trigger the action when performing a movement.

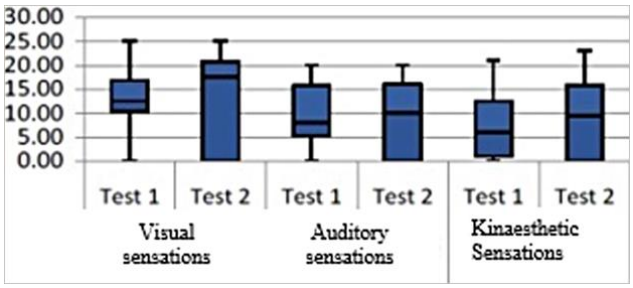

Figure 2. Comparative Testing 1 and 2 at Bandler R. & Thomson G

The illustration below features, on the ordinate, the values of auditory sensations at T_1, and on the abscissa, the values of visual sensations, as well as a good correlation at T_1 and a very good correlation at T_2.

We are observing recorded results on both Jacobson (Figs. 1 and 3) tests and also Bandler & Thomson' test (Figs. 1 and 2) on the three major categories of sensations such as visual, auditory and kinaesthetic applied as an experiment on the group of students. In making representations ideomotor, all sensory sub-modalities are particularly important underlying mental training. Keywords help trigger action in the execution of a movement.

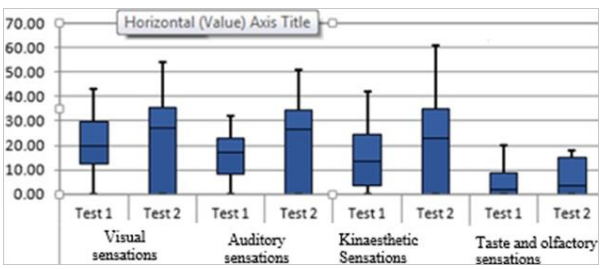

Figure 3. Testing 1 and 2 at Jacobson S., test

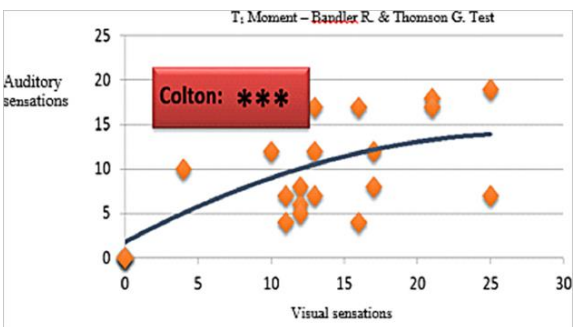

Figure 4. Correlations between auditory and visual sensations at testing T_1

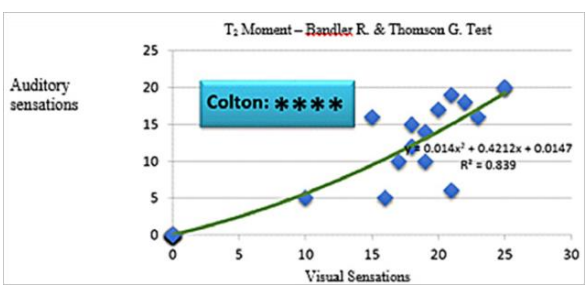

Figure 5. Correlations between auditory and visual sensations at testing T_2

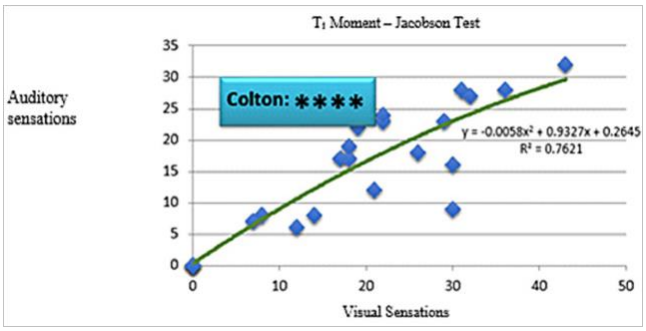

Figure 6. Moment T_1 Jacobson test, auditory and visual sensations

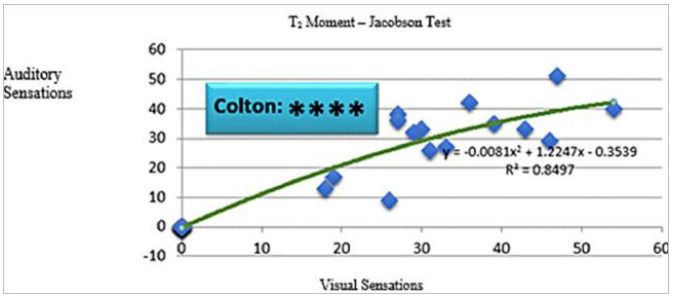

Figure 7. Moment T_2 Jacobson test, auditory and visual sensations

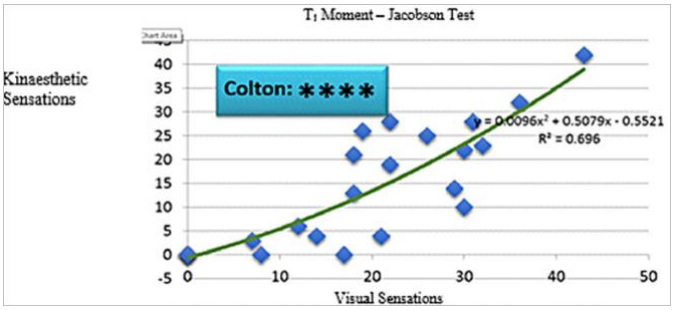

Figure 8. Moment T_1 Jacobson test, kinaesthetic and visual sensations

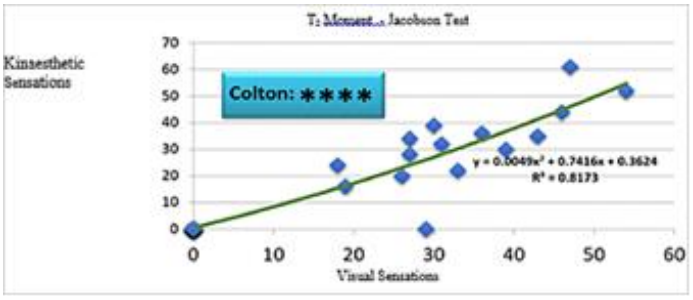

Figure 9. Moment T_2 Jacobson test, kinaesthetic and visual sensations

Figures 8 and 9 show the values of kinaesthetic and visual sensations at T_1 and T_2 at the Jacobson test.

Unlike the other correlations, which were initially good, and they turned into very good, the correlations between kinaesthetic and auditory sensations were very good from the beginning. This can be explained by the innervation of cranial nerves. More precisely, it is the eighth auditory vestibular nerve with somatic sensitive fibres on the auditory and on the vestibular branch. The

seeming origin is the pons, but it actually arises in the organ of Corti and the ganglion, whereas the terminus point is represented by the cochlear nuclei of the pons and the vestibular nuclear complex. It innervates the organ of Corti and the ampullary crests and the otolith organs called maculae. This explains the very good correlations between the two types of kinaesthetic and auditory sensations based on physiological knowledge. In order to improve the results of T_2, we have to ask the students to direct their thoughts better meaning to have clearly set objectives (Bandler & Fitzpatrick, 2011, p. 111).

According to Jacobson (2009, p. 136), all behaviours – in our case, responses – have a positive intention. Students give the best responses among those available. There are no errors, only outcomes; there is no failure, just feedback.

5. Conclusions and recommendations

We want to continue with this study because the time difference between T_1 and T_2 was very short and we want to extend this study to a minimum of 6 months. We have to remember in our work with students or athletes, if our objective is to produce a change by training, we will see 'how' is possible for our students to feel a certain sensation, and this fact is more important than 'why'.

Extending and enhancing the use of visualisation with several other NLP techniques (Carey, Churches, Hutchinson, Jones & Tosey, 2010, p. 22) show how Juley Newton describes the way in which she successfully combined visualisation, anchoring and storytelling to create an effective classroom climate.

All the lessons were made on modular basis in the second semester due to objective reasons. Very good correlations and in the same sense between SV – SA, SV – SK, SV – SOG, SA – SK and SK– SOG show that the motor skill (profound structure) will be the more complete as it is accompanied by its description and sensations. Words and visual, auditory, kinaesthetic, olfactory and gustatory sensations are part of the representational systems. Sensory language is a powerful tool for communication and world impact (O'Connor & McDermott, 2009).

All sensory sub-modalities are particularly important in achieving ideomotor representations, which are the basis of mental training. We will be able to work with students on different NLP techniques, on several sensory levels, among which we highlight the following: modifying mental visualisations and sensations for visual sub-modalities. For kinaesthetic sensations and emotions, we could work based on one of the techniques suggested by Jacobson (2009, p. 204). First, we will make subjects to determine and understand the concepts of sensations and kinaesthetic perceptions: tactile sensations will comprise the following sub-modalities: temperature, consistency, humidity and physical contact, proprioceptive sensations: internal pressure, tension, weight, body and arm position and not least, we will study vestibular sensations in terms of balance (body position in space and relation between body and gravity).

Modifying the sensory sub-modalities leads to an exchange at sensory modalities, which also creates profound changes in subjective experience (Marcello, 2003). The NLP principles offer us new instruments to modify and optimise our subjective experience. In order to succeed, we must understand what is unique in every experience, and the sensations are very important in our experience, the perceptions and interpretations that come from the outside pass in the background (Alder & Heather, 2013).

All sensory sub-modalities are particularly important in achieving ideomotor representations underlying the importance of NLP and mental training techniques. If the ideomotor representations are accompanied by many sensorial sub-modalities, the motor skills are richer and the motor skills specific to various sports are more complex. We must continue this study at least 6-month study to observe the difference.

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