The specifics of sensations and perceptions in students from different faculties

Emilia Florina GROSU¹, Hanna Imola VARI², Vlad Teodor GROSU³, Dan MONEA⁴

Abstract

Aim: This article is a starting point for a much wider research towards sensations and communication channels. Methods: Our research has taken place over four months and has had 50 participants, students from Physical Education and Sport Faculty and Fine Arts Faculty. The questionnaire used contained closed and open questions alongside standard questions. The results obtained from the research were statistically and graphically represented using SPSS Data Editor. Results: We obtained statistically significant results for the first hypothesis, namely that the participants studying fine arts will have more accurate visual feelings than those studying sports and physical education.

Key words: sensations, perceptions, sports, fine arts

Rezumat

Scop: Acest articol este un punct de pornire către o cercetare mult mai amplă în direcția senzățiilor și canalelor de comunicare. Metode: Cercetarea noastră s-a desfășurat pe parcursul a patru luni și a avut 50 de participanți, studenți de la Facultatea de Educație Fizică și de la Arte Plastice. Chestionarul utilizat a cuprins întrebări înclose și deschise, alături de întrebările standard. Rezultatele obținute în urma cercetării au fost reprezentate statistic și grafic utilizând programul SPSS Data Editor. Rezultate: Am obținut rezultate statistice semnificative în prima ipoteză. Studenții participanți de la Arte Plastice au avut acuratețea senzățiilor vizuale mai precisă, decât studenții de la Educație Fizică și Sport.

Cuvintecheie: senzății, percepții, sport, arteplastice

¹Professor, Physical Education and Sports Faculty, Babeș-Bolyai University, Cluj Napoca, Romania, email: emiliaflorina.grosu@gmail.com
²Assistant Professor, PhD, Physical Education and Sports Faculty, Babeș-Bolyai University, Cluj Napoca, Romania
³Lecturer, Faculty of Mechanical Engineering, Technical University of Cluj Napoca, Romania
⁴Associate Professor, Physical Education and Sports Faculty, Babeș-Bolyai University, Cluj Napoca, Romania
**Problem statement**

This article is intended to be a starting point for a much more complex research into the study of sensations for all five channels of communication: visual, auditory, kinesthetic, olfactory, and taste. The subjects of this small study are students from Babeş-Bolyai University and the University of Fine Arts.

Apart from the perceptions that define the communication channels above, we also encounter spatial perceptions in practical activity. Space perceptions ensure human orientation in the environment. Their importance in corporal activities lies in the fact that they give the subject the possibility to act in the most varied situations and conditions both in the sporting branches in which they act independently and in the activities in which he depends on the actions of his partners and opponents.

Space perceptions are very different. Existing objects in space have a certain size, shape, or volume and are perceived in depth and motion. Perceptions are achieved through the collaboration of several analysts, among which, along with the visual artistic, an important role is played by the Physical Education analyst.

Perceptions consist of sensations.

Sensation is a cognitive, psychic process and is the first level of knowledge of the world that surrounds us. Through this we receive information about the appropriation of objects and phenomena of the world. Types of sensations are determined by our sensory organs: hearing, visual sensations, taste sensations, smell and skin sensations. Năstase et. al. [1] analyzes the role of sensations and perceptions in the technical execution in ballet and dance training. Also, the influence of sound and vibrations on the impact on sport and on the perception of players is analyzed in an article published by the author in 2006.

The relationship between the internal and external visual imagery was analyzed by the representations of the motor act, mirrored by ideomotor representations. The results indicated a significant correlation between the image of the motor act and the perceived kinesthetic sensation. However, the correlation between internal visual imaging and kinesthetic imaging was not significant. The results are discussed in relation to the mentally-visual motor acts and the processes that can underpin the kinematic images. Callow, N., & Co.[2], Pop D.[3] shows in *The Eye and the Body - Modern and Postmodern in the philosophy of visual culture*, the relationship between subject and object from a visual perspective, it is a predictable picture of our relationship with nature and the environment. They form a mental ecosystem composed of collective representations by which we imagine the outer world [3].

The conscious perception of fatigue [4] was also examined.

Fatigue is described as a conscious sensation rather than a physiological appearance. Fatigue is the awareness of changes in subconscious homeostatic control systems and derives from a temporal difference between subconscious representations of these homeostatic control systems in neuronal networks that are induced by changes in activity level. These inconsistencies are perceived by the brain-producing structures as a feeling of fatigue. In this article, fatigue is a complex emotion that is affected by factors such as motivation and leadership, by other emotions such as anger, fear and memory of previous work; it is unclear whether the origin of conscious sensation of fatigue is associated with certain localized brain structures or is the result of electrophysiological synchronization of all brain activity [5].

Callow N. et al. [6] conducted a study on the efficacy of a kinesthetic imagery intervention of three professional flat-race horse jockeys, with the secondary objective of examining the relationship between performance and sport confidence. Other interesting articles refer to the characterization of reward and effort mechanisms in apathy [7].

Other authors have argued that this frontal-midline theta provides a neuro-physiologically plausible mechanism for optimally adjusting behavior to uncertainty, a hallmark of situations that exacerbates anxiety and demand cognitive control [8].
Purpose of the study
Given the place and role that scientific research plays in developing the field, any type of Sports or Artistic attitude, we aim to highlight the effect of Sports research in Art and sports programs on the functional development of man. Throughout our research, sports or artistic research intervention programs have been conducted in accordance with special sociological standards, completing different types of concepts and visions of any elaborate artistic creation, in which the sporting event seems real, the unrepeatable experience. In this paper we aim to identify the types of sensations and perceptions experienced by people belonging to different domains.
There is a close correlation between sensations, perceptions and representations. Representations are sensory images [9], on images and symbols, showing that through the succession of their own experiences, people as individuals and human communities manage to harmonize and maintain the rigor of their thinking.
Methods
Our research took place from March 2015 to June 2015 and included a total of 50 students participating in the questionnaire. Beforehand, a questionnaire was applied to the participants, after which appropriate responses were established. The questionnaire was applied in two steps. In the first stage students from the Faculty of Physical Education and Sport, from Babeş-Bolyai University of Cluj-Napoca, were questioned, while students and artists from the University of Art and Design were questioned in the second part.
The questionnaire contained closed and open questions alongside standard questions about the gender, age, occupation, and studies of the respondents. They attempted to provide a sociological picture of the perception of Sport in Art and its interdisciplinary state in the multitude of researched hypostases: submodal (visual, auditory, kinesthetic), and operative (visual, auditory, kinesthetic, olfactory/gustative) their simple schemes and motivations.
We have formulated two hypotheses:
• The participants from the fine arts field will have more accurate visual feelings than those from the physical education field of study.
• Physical education students will have more accurate kinesthetic feelings than plastic arts students.
The questionnaire was preceded by a series of explanations designed to achieve a qualitative side of the proposed sociological research. For the quantitative research of the obtained data we used the SPSS Manager® program. The data obtained were entered as variables in the SPSS Data Editor® program. Data from the application of the questionnaire was encoded and entered into the Microsoft Office Excel® program. The variables have been defined by assigning a name, setting the type, missing values, format, and notation. The obtained results were represented statistically and graphically.

Table I. Physical Education students after using the Sid Jacobson Test

| Nr | Name       | Visual submodality | Auralsubmodality | Kinestheticsubmodality | Submod. olfactory/gustatory | Total |
|----|------------|---------------------|------------------|------------------------|-----------------------------|-------|
| 1  | B K fitness | 35                  | 28               | 27                     | 15                          | 105   |
| 2  | O P fitness| 20                  | 16               | 28                     | 13                          | 77    |
| 3  | F M fitness| 22                  | 20               | 31                     | 15                          | 88    |
| 4  | M Mfootball| 13                  | 12               | 0                      | 0                           | 25    |
| 5  | P C football| 28                  | 28               | 32                     | 6                           | 94    |
| 6  | B E football| 25                  | 19               | 17                     | 0                           | 61    |
| Nr   | Name             | Visual submodality | Aural submodality | Kinesthetic submodality | Submod. olfactory/gustatory | Total |
|------|------------------|--------------------|-------------------|-------------------------|------------------------------|-------|
| 1    | T D              | 19                 | 17                | 13                      | 10                           | 59    |
| 2    | E G              | 18                 | 15                | 10                      | 10                           | 63    |
| 3    | G M              | 37                 | 25                | 33                      | 17                           | 102   |
| 4    | O A              | 33                 | 20                | 20                      | 21                           | 94    |
| 5    | B V              | 41                 | 32                | 40                      | 20                           | 133   |
| 6    | C I              | 15                 | 9                 | 19                      | 10                           | 53    |
| 7    | Z E              | 38                 | 30                | 36                      | 18                           | 122   |
| 8    | O O              | 29                 | 21                | 18                      | 12                           | 80    |
| 9    | C A              | 43                 | 32                | 38                      | 20                           | 133   |
| 10   | H G              | 52                 | 34                | 41                      | 21                           | 148   |
| 11   | G D              | 19                 | 17                | 13                      | 10                           | 59    |
| 12   | D J              | 18                 | 15                | 10                      | 10                           | 63    |
| 13   | H R              | 37                 | 25                | 33                      | 17                           | 102   |
| 14   | O I              | 33                 | 20                | 20                      | 21                           | 94    |
| 15   | V J              | 41                 | 32                | 40                      | 20                           | 133   |
| 16   | R H              | 15                 | 9                 | 19                      | 10                           | 53    |
| 17   | J I              | 38                 | 30                | 36                      | 18                           | 122   |
| 18   | D I              | 29                 | 21                | 18                      | 12                           | 80    |
| 19   | J K              | 43                 | 32                | 38                      | 20                           | 133   |
| 20   | H U              | 52                 | 34                | 41                      | 21                           | 148   |
As we can see, the highest total of submodalities in a Physical Education student is 129 (a practitioner of sports dance), less than an artist (148). Hart E.A.et.al.[10] showed that the human perceptions of their physiques constituted a central yet insufficiently researched aspect of exercise psychology and that is why we decided to conduct this experiment.

**Table III. Physical Education students after the Richard Bandler&Garner Thomson Test**

| No | Name       | Visual submodalities | Aural submodalities | Kinesthetic submodalities | Total |
|----|------------|----------------------|---------------------|--------------------------|-------|
| 1  | B K fitness | 25                   | 20                  | 21                       | 66    |
| 2  | O P fitness | 23                   | 18                  | 19                       | 60    |
| 3  | F M fitness | 22                   | 19                  | 22                       | 63    |
| 4  | M M football | 13                  | 12                  | 0                        | 25    |
| 5  | P C football | 26                  | 20                  | 21                       | 67    |
| 6  | B E football | 15                  | 18                  | 21                       | 54    |
| 7  | C V dans sp | 35                   | 30                  | 27                       | 92    |
| 8  | V C swim   | 25                   | 19                  | 24                       | 68    |
| 9  | D S gimn.  | 12                   | 5                   | 2                        | 19    |
| 10 | C V basketball | 22               | 20                  | 22                       | 64    |
| 11 | S C football | 36                  | 20                  | 19                       | 75    |
| 12 | P F football | 23                  | 19                  | 22                       | 64    |
| 13 | Cr P athletics | 33                 | 19                  | 23                       | 75    |
| 14 | V S ski    | 21                   | 18                  | 18                       | 57    |
| 15 | K G fitness | 25                   | 20                  | 21                       | 66    |
| 16 | P O fitness | 23                   | 18                  | 19                       | 60    |
| 17 | E M fitness | 22                   | 19                  | 22                       | 63    |
| 18 | G F football | 13                  | 12                  | 0                        | 25    |
| 19 | F H football | 26                  | 20                  | 21                       | 67    |
| 20 | J I football | 15                  | 18                  | 21                       | 54    |
| 21 | A J dans sp. | 35                  | 30                  | 27                       | 92    |
| 22 | V H swim   | 25                   | 19                  | 24                       | 68    |
| 23 | G L gimn.  | 12                   | 5                   | 2                        | 19    |
| 24 | J L basketball | 22                 | 20                  | 22                       | 64    |
| 25 | C S football | 36                   | 20                  | 19                       | 75    |
| 26 | K C football | 23                  | 19                  | 22                       | 64    |
| 27 | C O athletics | 33                 | 19                  | 23                       | 75    |
| 28 | V F ski    | 21                   | 18                  | 18                       | 57    |

**Table IV. Arts students after using the Richard Bandler&Garner Thomson Test**

| No | Name   | Visual submodality | Aural submodality | Kinesthetic submodality | Total |
|----|--------|--------------------|-------------------|-------------------------|-------|
| 1  | T D    | 21                 | 15                | 8                       | 44    |
| 2  | E G    | 36                 | 22                | 9                       | 67    |
| 3  | G M    | 30                 | 16                | 19                      | 65    |
| 4  | O A.   | 32                 | 12                | 16                      | 60    |
| 5  | B V    | 36                 | 25                | 24                      | 85    |
| 6  | C I    | 21                 | 8                 | 8                       | 37    |
| 7  | Z E    | 36                 | 24                | 20                      | 80    |
| 8  | O O    | 23                 | 17                | 18                      | 58    |
| 9  | C A    | 37                 | 26                | 24                      | 87    |
| 10 | H G    | 42                 | 24                | 25                      | 91    |
Following Bandler R., Thomson G. et. al. [11], test results of artists are better than those of athletes'. The total visual, auditory and kinesthetic submodality is 75, the highest for an athlete, and 91 for a student from the Fine Arts. Representations are considered to be a generalized image of an object [12].

**Statistics – a comparison between fine arts and physical education students**

In Table 5 we can observe the comparative statistical results of students from Physical Education and Sports (EFS) and Fine Arts.

**Table V. Kinesthetic, auditory, visual, olfactory-taste sensations in EFS and Fine Arts**

| Participant          | N  | Mean    | Std. Deviation | Std. Error | Mean |
|----------------------|----|---------|----------------|------------|------|
| **S kinesthetic**    |    |         |                |            |      |
| Jacobson             |    |         |                |            |      |
| Physical Education   | 28 | 25.2143 | 13.53283       | 2.55747    |      |
| Fine Arts            | 20 | 26.8000 | 11.61487       | 2.59716    |      |
| **S acoustic**       |    |         |                |            |      |
| Jacobson             |    |         |                |            |      |
| Physical Education   | 28 | 20.8571 | 8.46655        | 1.60003    |      |
| Fine Arts            | 20 | 23.5000 | 8.22384        | 1.83891    |      |
| **S visual**         |    |         |                |            |      |
| Jacobson             |    |         |                |            |      |
| Physical Education   | 28 | 26.8571 | 7.52140        | 1.42141    |      |
| Fine Arts            | 20 | 32.5000 | 11.80767       | 2.64028    |      |
| **S olfactory-gustative** | | | | | |
| Jacobson             |    |         |                |            |      |
| Physical Education   | 28 | 9.3571  | 6.61768        | 1.25062    |      |
| Fine Arts            | 20 | 15.9000 | 4.71169        | 1.05357    |      |
| **S visual**         |    |         |                |            |      |
| Bandler              |    |         |                |            |      |
| Physical Education   | 28 | 23.6429 | 7.27866        | 1.37554    |      |
| Fine Arts            | 20 | 31.4000 | 7.22860        | 1.61636    |      |
| **S acoustic**       |    |         |                |            |      |
| Bandler              |    |         |                |            |      |
| Physical Education   | 28 | 18.3571 | 5.21546        | 0.98563    |      |
| Fine Arts            | 20 | 18.9000 | 6.00789        | 1.34340    |      |
| **S kinesthetic**    |    |         |                |            |      |
| Bandler              |    |         |                |            |      |
| Physical Education   | 28 | 18.6429 | 7.66529        | 1.44860    |      |
| Fine Arts            | 20 | 17.1000 | 6.51234        | 1.45620    |      |

**Findings and Results**

To test the proposed hypotheses, we applied a test for independent samples using the SPSS program. We only analyzed the visual and kinesthetic sensations part measured by both Jacobson and Bandler tests. The first hypothesis was confirmed if we take a look at the Bandler test because the assumption of equality of variance is fulfilled. An average M = 23 for the physical education participants and an average M = 31 for the artists, while t (46) = -3.6, 0.0 < 0.05, meaning statistically significant. In other words, the participants in the visual arts field have more developed visual feelings than Physical Education students. For the Jacobson
measurement, a statistical significance p has been obtained, but cannot be taken into account because the assumption of equality of variance has not been fulfilled.

Regarding the second hypothesis, related to kinesthetic sensations, the results in the Jacobson test were the following: \( t(46) = -0.4, p + 0.6 > 0.05 \), and for Bandler: \( t(46) = 0.7, p = 0.4 > 0.05 \). The second hypothesis was not confirmed because statistically significant results could not be obtained.

**Table VI. T Test for independent samples**

|                      | Levene's Test for Equality of Variances | t-test for Equality of Means |
|----------------------|----------------------------------------|-----------------------------|
|                      | F    | Sig. | t    | df | Sig. (2-tailed) | Mean difference | Std. Error difference | 95% Confidence interval of the difference |
| S_kinesthetic        |      |      |      |    |                |                 |                          |                                      |
| Jacobson             |      |      |      |    |                |                 |                          |                                      |
| Equal variances assumed | 0.000 | 0.984 | -0.424 | 46 | 0.674 | -1.585 | 3.740 | -9.114 | 5.943 |
| Equal variances not assumed | -0.435 | 44.36 | 0.666 | 1.585 | 3.644 | -8.930 | 5.758 |
| S_visual             |      |      |      |    |                |                 |                          |                                      |
| Jacobson             |      |      |      |    |                |                 |                          |                                      |
| Equal variances assumed | 6.244 | 0.016 | -2.023 | 46 | 0.049 | -5.642 | 2.789 | -11.258 | -0.0275 |
| Equal variances not assumed | -1.882 | 29.84 | 0.070 | -5.642 | 2.998 | -11.768 | 4.823 |
| S_visualBandler      |      |      |      |    |                |                 |                          |                                      |
| Equal variances assumed | 0.287 | 0.595 | -3.651 | 46 | 0.001 | -7.757 | 2.124 | -12.034 | -3.479 |
| Equal variances not assumed | -3.655 | 41.25 | 0.001 | -7.757 | 2.122 | -12.042 | -3.471 |
| S_kinesthetic         |      |      |      |    |                |                 |                          |                                      |
| Bandler               |      |      |      |    |                |                 |                          |                                      |
| Equal variances assumed | 0.061 | 0.805 | 0.731 | 46 | 0.469 | 1.542 | 2.111 | -2.706 | 5.792 |
| Equal variances not assumed | 0.751 | 44.52 | 0.457 | 1.54286 | 2.05401 | -2.595 | 5.681 |
Figure 1. Data of visual, auditory, kinesthetic and olfactory sensations when applying the Jacobson test

As can be seen in Figure 1, students in the visual arts have visual, auditory, and kinesthetic feelings that are more accurate than those of Physical Education students.

As for the olfactory-gustatory sensations, the same profile is maintained, being of higher value for the students of the Fine Arts.

The role of sensations, perceptions, representations, and imagination is present in the mind while gathering the information. In Nastase’s article[16], the side of formation, memorizing and technical movement, logic of the imagination for standard and Latin dance is being analysed. A study aimed to examine the perceptions of sports people wearing different uniform colors in competitions[17]. The assessment of sports performance’ equipment is derived from technical parameters mostly, like accuracy, distance, speed and power. Robert J. and his team analyzed the individual perceptions[18].

An auditory and tactile sensation from impact was found to influence the feel of a shot in many sports[19].
The perception of time depends on the appreciation of the duration and the changes in the moments of the actions taken by a person. As in the perception of time in human consciousness, the relationships between the various stages or moments of certain phenomena, their alternation and their sequence are reflected. Visual holograms of Rudie Berkhout's work, as they are sometimes prefigured in artistic works, are represented by a group of lines, shapes and colors and often do not tell us anything. On the other hand, they manage to contribute to our temporal perceptions through the aesthetic value of the compositions that have an impact on one's personal aesthetic sensibility. On the ground of a receptive aesthetic attitude it will be easier to build ethical and educational consciousness [13].

The thermo-spatial perception is influenced by a series of dimensions: the nature and magnitude of the spatial contexts, the kinetic state of the people, and the temporal scale of their perception: now or in the past. Recently, new qualitative methods have been developed to link the thermal and spatial information of people's perceptions. In order to get an overview of these methods, we conducted an extensive review of the literature. The results of this research have shown that these qualitative methods respond to various dimensions through long-term, thermal, perceptual, research combinations in a stationary and moving mode in different spatial environments. These qualitative methods provide an explicit combination of thermal and space combinations [14]. Other studies, such as Bădău D., and Bădu A., [15] show that between the components of the physiological capacity and the physical degree of physical exercise is a direct interrelation, which is influenced by a number of factors, out of which deployment environment with its features has got a leading role.

References
1. Năstase V. D. (2012). The Performance Capacity Analysis and its Application in the Integral Dance Sport Training Model, Procedia - Social and Behavioral Sciences, vol 51, 967-97.
2. Callow N., Matthew Smith, J. Hardy L., Calum A. & Hardy J. (2015). Measurement of Transformational Leadership and its Relationship with Team Cohesion and Performance Level, Journal of Applied Sport Psychology, vol 2, 17-20.
3. Pop D. (2005). Ochial și Corpul - Modern și postmodern în filosofia culturii vizuale, Editura Dacia, Cluj-Napoca, 56-58
4. Walton E, Allen S. (2011). Malnutrition in developing countries. Paediatrics and Child Health, 21, 418-24.
5. Șchiopu U. (2009). Psihomotricitate, Editura România Press, 21-24.
6. Callow N., Waters N. (2003). The effect of kinesthetic imagery on the sport confidence of flat-race horse jockeys, Psychology of Sport and Exercise, 2005 – Elsevier, vol 6, 443-459.
7. Bonnelle V., Veroman K., Burnet Heyes S., Lo Sterzo E., Manohar S., Hussain M. (2015). Characterization of reward and effort mechanisms in apathy, J. Physiol. Paris 109 (1-3), 16-26.
8. Cavanagh J., Shackman A. J. (2014). Frontal midline theta reflects anxiety and cognitive control: Meta-analytic evidence, J. Physiol. Paris, 109(1-3), 3-15.
9. Eliade M. (1994). Imagini și simboluri, Ed. Humanitas, București, 36-52
10. Hart E.A., Leary M.R., Rejeski W.J. (1989). The measurement of social physique anxiety, Journal of Sport & Exercise Psychology, 11, 94-104.
11. Bandler R., & Thomson G., (2011). The Secrets of Being Happy, PNL e Liberta, EditoreAllesio Roberti, BG, Italia, 111.
12. Grosu E.F. (2009). Psihomotoricitate, Ed. GMI, Cluj-Napoca, 46.
13. Berkhout R., (1982). Handbook of Signal Processing in Acoustics, vol 1-2, published by David Havelock, Sonoko Kuwano, Michael Vorländer, Springer, 25-26.
14. Lenzholzer S., Klemm Wiebke K., Vasilikou K., (2016). Qualitative methods to explore thermo-spatial
15. Bădău D., Bădău A., (2015). The Influence of various types of water gymnastics upon the exercise capacity, International Journal of Science Culture and Sport, 94-102.

16. Năstase V. D. (2012). The role of sensations, perceptions and representations in learning dance sport, Procedia - Social and Behavioral Sciences, vol 51, 957-960.

17. Recours R. (2015). The effect of red and blue uniforms on competitive anxiety and self-confidence in virtual sports contests, European Review of Applied Psychology, vol 65, 67-69.

18. Roberts J. (2001). Human perceptions of sports equipment under playing conditions, Journal of sports sciences, 19(7), 485-97.

19. Jones R. (2006). Influence of sound and vibration from sports impacts on players’ perceptions of equipment quality, Sage Journals, vol 50, 361-64.