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# APPLICATION OF SOCIOMETRIC TESTING AND EVALUATION OF NATURAL SITUATION AS A FACTOR TO IMPROVE MEASURING TRAINING

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**Abstract**

In order to improve the training process in the swimming sport, a survey was conducted in which 30 athletes (12-14 years old, boys and girls) were divided into 2 equal groups according to an official scientific sociometric test that they were given to complete, as well as similar physical fitness tests. Based on the information gathered from these two tests, the following groups were formed:

1) The experimental group, in which the work was carried out with homogeneous segments and

2) The control group in which the work was carried out with heterogeneous segments.

The control team followed the traditional way of training, where the main disadvantage was that the coach worked at the same time with all athletes, regardless of social preference and physical condition, with the result that the stimuli accepted by athletes did not bring the expected performance.

However, this is not the case with the experimental group, in which its members clearly had better personal relationships and about the same physical condition. As a consequence, the stimuli that they received daily in training were as effective for everyone. At the same time, the same tests were applied to the members of the experimental group where, according to these results, 3 subcategories were obtained, aiming at better training and best results.

At the end of the second year, our research showed that the experimental group had clearly better performances than the control group, which at the beginning of the first year of the survey had much better results. So I strongly recommend grouping as this is more effective and interesting.

**Keywords:** sociometric test, fitness, performance, groups, measurements

## Introduction

The content of this work is directed towards the study and experimentation of the modern issue of improving the training process, finding new forms of organizing training and learning activity, which should be as effective as possible and consistent with modern requirements.

For this purpose, a sociometric test was used to help us gather information about the personal relationships of our team members so that we can divide our athletes into groups in which members' relationships run smoothly.

The sociometric test can be used by both educators and coaches to study social interactions within a group, which may be either a school class, a sports team or a working group, etc.

It enables us to collect information directly from participants in the group, who are asked to complete a sociometric questionnaire. This information comes to complement those that come from our observation.

From this questionnaire we can extract information regarding the choice / preference of the rejection or indifference expressed by a member of the group towards the other members.

Once the collection of information has been completed, we can identify children that are more or less popular.

We have the ability to make judgments about the overall climate of the group inspirational and founder of the sociometric test, the Hungarian psychiatrist / researcher J.L Moreno. "Considered by many theorists to be a specific form of the psychosocial investigation, sociometric analysis was imposed with the advent of JL Moreno's work" We will survive "through which he manifests his intention to find a way of probing interpersonal relationships within groups small, especially those of preferential nature" (Schratz M., 1997).

Five (5) key steps for applying the test:

1. Choosing a sociometric test.
2. Instructions-conducting the test.
3. Formation of a sociometric table.

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4. Interpretation of a sociometric table.
5. Pedagogical exploitation.

Apart from the sociometric test, which would give us useful information on team separation, we also used an athlete's physical fitness test to ensure that our teams are as uniform as possible.

In this physical fitness test that the athletes were called to pass, we chose 4 exercises that would give us the appropriate information about the athletic level athletes at that time.

*The 4 exercises are as follows:*

1. Exercise of speed. (Speed is the most important factor in the performance of most sporting activities. This velocity is the maximum power, strength, and functionality of the neuromuscular system to achieve the highest responses and speeds of movement under certain conditions, says Grosser (1994), quoted by Solomon (1999). It is the kinetic ability the person responding quickly to a stimulus with the greatest possible motor velocity with or without external reactions).
2. Exercise flexibility of the trunk. (Elasticity measurement of the waist.) Flexibility is a necessary component for the motion range of a joint, the main technique used was stretching.
3. Muscular strength test (bends). (This test records the general strength and strength of the athlete's upper torso, where the sport of swimming is a particularly important factor of success.) Muscular endurance is the ability of a muscle to generate maximum recurring contractions or to exert continuous force against a fixed object Essentially, muscle strength determines how much a muscle can work in time.
4. Muscular endurance test (abdominal). (Strong abdomens are one of the most important factors for a successful and safe participation of athletes in almost all sports. We measure how many abs do in one minute the athlete).

The sociometric questionnaire used to form the groups was as follows:
Full name..... .....

Who your teammates would like to work with in the same team
1 ..... .....
2 ..... .....
3 ..... .....

Who your teammates would not want to work with in the same team
1 ..... .....
2 ..... .....
3 ..... .....

In a simple form, we ask the children to write down their preferences (up to 3) for cooperation. We tell our athletes why we need this information, and assure them that we will never announce what have responded. Children are also asked to not discuss with each other what they asked for in the questionnaire.

The research activity took place at the National Swimming Pool of Thessaloniki, during the years 2017-2018, athletes and gymnasts belonging to the same team of 12-14 years old took part in the survey. Our team consists of 30 people who were invited to participate in a physical fitness test designed to help us split our athletes into two teams. The experimental group and the control group. The best-rated children in this test followed the control team, which worked in the traditional way throughout the research. The members of this group may not have had the best personal relationships, but this was what was required for the experimental team. The remaining 15 people completed the experimental group whose members were required by a sociometric test given to them to choose with which individuals they would like to be in the same group so that the experimental group could be divided into 3 subgroups.

The aim of this research was to find out whether good personal relationships between athletes as well as effective communication between them are enough to increase their performance and lead to success.

The control group was homogeneous in the physical condition of the athletes, and the experimental was homogeneous both in the physical training of the children and in the personal relationships between them.

The fitness test and athletes' performance are listed in the following table:

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Table no. 1

| A/A | Full Name | Speed 400μ | Flexibility on the Bore cm | Push ups 60 sec | ABS 60 sec |
|---|---|---|---|---|---|
| 1 | D.T | 1:14:12 | 12 | 36 | 46 |
| 2 | O.H | 1:13:34 | 11 | 36 | 48 |
| 3 | B.D | 1:17:80 | 6 | 27 | 40 |
| 4 | A.O | 1:18:67 | 7 | 24 | 37 |
| 5 | X.B | 1:25:45 | 7 | 25 | 26 |
| 6 | O.I | 1:27:23 | 5 | 23 | 24 |
| 7 | I.C | 1:13:89 | 11 | 38 | 50 |
| 8 | Z.F | 1:21:65 | 6 | 29 | 30 |
| 9 | D.P | 1:24:45 | 8 | 28 | 38 |
| 10 | T.L | 1:15:10 | 10 | 35 | 41 |
| 11 | N.L | 1:19:34 | 7 | 28 | 35 |
| 12 | D.C | 1:26:10 | 6 | 24 | 31 |
| 13 | M.C | 1:22:39 | 8 | 20 | 29 |
| 14 | B.C | 1:14:28 | 12 | 37 | 45 |
| 15 | E.L | 1:15:05 | 10 | 39 | 48 |
| 16 | M.T | 1:12:26 | 13 | 42 | 55 |
| 17 | B.F | 1:19:89 | 9 | 30 | 42 |
| 18 | N.M | 1:14:78 | 11 | 37 | 49 |
| 19 | A.E | 1:12:78 | 14 | 48 | 49 |
| 20 | C.P | 1:17:34 | 9 | 26 | 31 |
| 21 | C.B | 1:13:67 | 10 | 39 | 46 |
| 22 | P.I | 1:12:69 | 10 | 49 | 51 |
| 23 | N.G | 1:11:03 | 11 | 51 | 53 |
| 24 | E.B | 1:13:89 | 11 | 40 | 47 |
| 25 | T.P | 1:27:23 | 6 | 21 | 30 |
| 26 | E.C | 1:15:67 | 9 | 31 | 38 |
| 27 | M.D | 1:17:80 | 9 | 29 | 40 |
| 28 | E.G | 1:14:60 | 11 | 36 | 41 |
| 29 | S.T | 1:21:56 | 7 | 27 | 37 |
| 30 | M.P | 1:23:18 | 9 | 25 | 33 |

According to the prices shown in the above table, we divided our athletes into two groups.

Table no. 2 **TEAMS**

| | *EXPERIMENTAL GROUP* | *CONTROL TEAM* |
|---|---|---|
| 1 | B.D | O.H |
| 2 | A.O | I.C |
| 3 | N.L | T.L |
| 4 | B.F | B.C |
| 5 | C.P | E.L |
| 6 | M.D | M.T |
| 7 | X.B | N.M |
| 8 | O.I | A.E |
| 9 | Z.F | C.B |
| 10 | D.P | P.I |
| 11 | D.C | N.G |
| 12 | M.C | E.B |
| 13 | T.P | E.C |
| 14 | S.T | E.G |
| 15 | M.P | D.T |

Formation of a sociometric table of the experimental group (up to 3 positive and 3 negative choices)

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Table no. 3

| | B.D | A.O | N.L | B.F | C.P | M.D | X.B | O.I | Z.F | D.P | D.C | M.C | T.P | S.T | M.P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B.D | | | + | | | ---- | + | | -- | | | | | -- | + |
| A.O | --- | | | | + | | | + | | --- | | --- | | + | |
| N.L | + | --- | | | | -- | + | | | --- | | | + | | |
| B.F | | | | -- | | + | | --- | + | + | | | | --- | --- |
| C.P | | + | --- | | | | | + | | | + | | --- | | -- |
| M.D | --- | | | + | | | | | + | + | --- | | | ---- | |
| X.B | + | | + | -- | --- | | | | | + | | --- | | | + |
| O.I | -- | + | | | + | | | | | | | --- | | + | --- |
| Z.F | -- | | | + | --- | + | | | | | --- | + | | | |
| D,P | | | | + | | + | --- | | + | | | | --- | | ---- |
| D.C | | + | | | | | | + | | --- | | | --- | + | --- |
| M.C | | | | + | | + | --- | | | + | --- | | ---- | | |
| T.P | + | | + | | | -- | | | | --- | --- | + | | -- | + |
| S.T | -- | + | | | | --- | | + | ---- | | + | | | | |
| M.P | + | | + | | ---- | | + | | | | --- | | ---- | | |

According to Table 3, we created 3 teams of (5) five athletes so we can train them as divided as possible according to the best personal relationships they can have with each other.

The 3 groups were divided as follows:

Table no. 4

| *1$^{η}$ TEAM* | *2$^{H}$ TEAM* | *3$^{H}$ TEAM* |
|---|---|---|
| B.D | A.O | B.F |
| N.L | C.P | Z.F |
| X.B | O.I | M.D |
| M.P | S.T | M.C |
| T.P | D.C | D.P |

After the above two tests that were carried out to all athletes, the above tables were produced, according to them, we have the composition of two teams. The experimental part and the control section.

In the experimental group, which was then divided into 3 groups, there are friendships between members, that is, an equal relationship, from which the members that make up the group are satisfied. There is reciprocity, emotional interaction, interest, fun and security.

"Through friendly relationships, the individual is socialized, develops social skills and personal developmental features such as self-awareness and self-esteem. Therefore, it is understood that the effects of friendship in human life are varied and mainly beneficial, "says Berndt T. J. (2002). We wanted to take advantage of the positive climate between our members during the training session, we wanted to avoid jealousy, conflict, sovereignty and bad competition.

In the control group, things were different as long as there were no such friendships, the members of this group were homogeneous only in terms of their performance. There were no friendships between the children, the relationships between them were not safe, the children were very suspicious, and they could not trust them.

There were doubts, often conflicts between them, there was an emotional gap, which made it difficult to catch up because of the fear of a relationship as a result of fear of rejecting them. “People who do not feel safe in the area where they are often show aggressive attitudes, with strong feelings of anger and jealousy. They have low self-esteem and self-confidence and find it difficult to recognize their own feelings as well as others” (Meyer E., 1987).

Workouts in both teams were performed daily except Sunday, 2 hours each day.

The traditional training mode, which was selected in the control group, has several disadvantages such as:

• Team blocking is not taken into account. This is very important for the integration of athletes with a low sociometric position (level), because in the various games and teamwork, in the majority of cases, there are athletes who are not selected in the teams, or if they are chosen, they are not asked to cooperate and do not participate in activities. This is due to the fact that the teams are formed by the coach without calculating the functionality of the preferred relationships;

• The coach requires the same effort and interest from all athletes, when there are some who do not have the training and the effort required of them exceeds them;

• The dynamic nature of group members (division) is not taken into account.

All of the above, perhaps other elements, make bathing training sometimes carried out at a low level, with low efficiency, not to be of interest to the majority of athletes, and thus not attaining the target athletes. When in a team the athletes do not feel safe and the climate is not friendly, then the athlete does not have good psychology either in the training or the race.

"The psychological factor is the mood, the motivation to fight the athlete, the interest he shows, the anxiety, the self-confidence, the concentration and the ability to focus on the appropriate elements, the ability to manage situations and difficulties, the emotional management of the self of" (Herman C., H., 1986).

In the experimental team, where the athletes had very good relationships with their athletes, the training was in an excellent climate, there was motivation, communication, motivation, organization, and one helping the other tried for the good of all members. There were no conflicts or implications among the athletes.

From January 2017 until December of the same year, both teams took part in all the races that took place in these categories that our athletes are aged. Specifically, they took part in 4 championships so that all children run in all the events so we can get a picture of their results, compared to the two years of the survey. The results of the control group athletes as well as the results of the experimental group for 2017 are presented in the tables below.

Table no. 5

*CONTROL TEAM RESULTS OF THE GAMES 2017*

| A/A | Full name | 100 Free style | 200 Free style | 100 Backstroke | 50 Butterfly |
|---|---|---|---|---|---|
| 1 | O.H | 1:15:89 | 2:50:56 | 1:25:56 | 00:49:67 |
| 2 | I.C | 1:17:20 | 2:58:10 | 1:28:34 | 00:51:56 |
| 3 | T.L | 1:15:56 | 2:51:56 | 1:26:69 | 00:52:87 |
| 4 | B.C | 1:18:33 | 2:55:19 | 1:29:45 | 00:52:87 |
| 5 | E.L | 1:18:45 | 2:57:34 | 1:27:28 | 00:55:29 |
| 6 | M.T | 1:19:78 | 3:00:45 | 1:28:90 | 00:54:90 |
| 7 | N.M | 1:16:22 | 2:59:39 | 1:27:45 | 00:49:67 |
| 8 | A.E | 1:17:29 | 3:02:69 | 1:24:87 | 00:51:78 |
| 9 | C.B | 1:15:12 | 3:04:29 | 1:23:67 | 00:53:89 |
| 10 | P.I | 1:19:56 | 2:58:93 | 1:26:30 | 00:50:45 |
| 11 | N.G | 1:22:45 | 3:05:38 | 1:30:38 | 00:55:69 |
| 12 | E.B | 1:20:56 | 2:59:18 | 1:31:60 | 00:57:69 |
| 13 | E.C | 1:18:29 | 2:56:51 | 1:26:34 | 00:51:89 |
| 14 | E.G | 1:22:78 | 3:08:78 | 1:32:67 | 00:54:71 |
| 15 | D.T | 1:21:56 | 3:04:12 | 1:31:38 | 00:56:94 |

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Table 6

| *EXPERIMENTAL TEAM RESULTS OF THE GAMES 2017* | | | | | |
|---|---|---|---|---|---|
| A/A | Full Name | 100 Free style | 200 Free style | 100 Backstroke | 50 Butterfly |
| 1 | B.D | 1:19:69 | 3::02:45 | 1:23:93 | 00:54:86 |
| 2 | A.O | 1:21:89 | 3:05:32 | 1:26:67 | 00:55:67 |
| 3 | N.L | 1:26:34 | 3:10:89 | 1:32:82 | 00:59:45 |
| 4 | B.F | 1:26:21 | 3:11:59 | 1:33:52 | 01:04:62 |
| 5 | C.P | 1:24:78 | 3:08:61 | 1:29:62 | 01:01:38 |
| 6 | M.D | 1:23:89 | 3:02:29 | 1:27:62 | 00:58:35 |
| 7 | X.B | 1:19:78 | 3:01:68 | 1:25:61 | 00:56:72 |
| 8 | O.I | 1:24:61 | 3:07:28 | 1:31:16 | 01:02:52 |
| 9 | Z.F | 1:24:67 | 3:09:62 | 1:30:49 | 01:03:62 |
| 10 | D.P | 1:20:49 | 3:03:02 | 1:28:16 | 00:58:02 |
| 11 | D.C | 1:21:49 | 3:04:62 | 1:30:30 | 00:57:31 |
| 12 | M.C | 1:24:67 | 3:10:36 | 1:31:48 | 01:01:94 |
| 13 | T.P | 1:26:56 | 3:14:92 | 1:35:81 | 01:05:57 |
| 14 | S.T | 1:22:61 | 3:10:58 | 1:33:28 | 01:00:45 |
| 15 | M.P | 1:23:50 | 3:09:52 | 1:35:62 | 01:03:58 |

According to tables 5 and 6 we find that the control group for 2017 has better times for the experimental group. Then we will present two more tables with the racing results of the year 2018.

Table 7

| *CONTROL TEAM RESULTS OF THE GAMES 2018* | | | | | |
|---|---|---|---|---|---|
| A/A | Full Name | 100 Free style | 200 Free style | 100 Backstroke | 50 Butterfly |
| 1 | O.H | 1:18:76 | 2:53:78 | 1:27:59 | 00:52:56 |
| 2 | I.C | 1:19:67 | 3:04:95 | 1:32:00 | 00:53:13 |
| 3 | T.L | 1:17:45 | 2:56:47 | 1:29:29 | 00:55:56 |
| 4 | B.C | 1:23:79 | 3:00:82 | 1:33:69 | 00:57:00 |
| 5 | E.L | 1:21:58 | 3:05:67 | 1:30:37 | 00:59:48 |
| 6 | M.T | 1:23:67 | 3:03:29 | 1:31:38 | 00:58:27 |
| 7 | N.M | 1:18:59 | 3:04:69 | 1:34:47 | 00:53:27 |
| 8 | A.E | 1:20:67 | 3:06:29 | 1:27:62 | 00:56:37 |
| 9 | C.B | 1:18:45 | 3:08:58 | 1:26:17 | 00:57:69 |
| 10 | P.I | 1:2356 | 3:09:25 | 1:30:29 | 00:52:36 |
| 11 | N.G | 1:26:25 | 3:10:59 | 1:36:25 | 00:58:48 |
| 12 | E.B | 1:24:78 | 3:04:69 | 1:36:16 | 01:01:45 |
| 13 | E.C | 1:22:69 | 3:00:28 | 1:30:46 | 00:56:82 |
| 14 | E.G | 1:26:78 | 3:14:48 | 1:36:15 | 00:58:17 |
| 15 | D.T | 1:24:53 | 3:08:40 | 1:34:52 | 01:00:81 |

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Table 8

| *EXPERIMENTAL TEAM RESULTS OF THE GAMES 2018* | | | | | |
|---|---|---|---|---|---|
| A/A | Full Name | 100 Free style | 200 Free style | 100 Backstroke | 50 Butterfly |
| 1 | B.D | 1:17:35 | 2:58:79 | 1:20:27 | 00:52:56 |
| 2 | A.O | 1:18:56 | 3:01:28 | 1:23:62 | 00:54:13 |
| 3 | N.L | 1:22:23 | 3:04:62 | 1:28:39 | 00:57:27 |
| 4 | B.F | 1:21:38 | 3:06:03 | 1:30:28 | 0059:37 |
| 5 | C.P | 1:20:56 | 3:04:05 | 1:25:53 | 00:57:26 |
| 6 | M.D | 1:19:39 | 2:57:31 | 1:24:69 | 00:56:16 |
| 7 | X.B | 1:16:47 | 2:56:17 | 1:22:41 | 00:55:26 |
| 8 | O.I | 1:22:28 | 3:02:53 | 1:26:28 | 00:58:69 |
| 9 | Z.F | 1:22:17 | 3:06:24 | 1:25:25 | 01:00:34 |
| 10 | D.P | 1:17:59 | 2:58:25 | 1:24:36 | 00:56:45 |
| 11 | D.C | 1:17:49 | 2:59:71 | 1:25:17 | 00:54:28 |
| 12 | M.C | 1:21:72 | 3:04:62 | 1:28:42 | 00:58:38 |
| 13 | T.P | 1:23:56 | 3:10:52 | 1:30:39 | 01:02:49 |
| 14 | S.T | 1:18:29 | 3:05:48 | 1:25:73 | 00:56:29 |
| 15 | M.P | 1:20:69 | 3:04:58 | 1:30:27 | 00:58:16 |

As we can see, in Tables 7 and 8, the control team has reduced its performance significantly in the year 2018, while the experimental group has much better times than last year. It is therefore considered that work in a friendly environment can work positively in sport, offering athletes not only an ideal training environment but also many distinctions and achievement of goals. Overall, until now research has generally supported the primacy of team performance, and especially among members who have good relationships with each other, the activity is more productive. When in a group of people who in our case are athletes, good mood, solidarity, contribution, moral superiority are absent, then we have unacceptable behaviors that benefit no one but only harm the whole. Relationships between control team members were uninteresting since the start of the experiment, but they worsened in the second year because athletes saw their performance falling. In contrast to the experimental group, the members' relationships have always been very good, and since the athletes saw a positive development in their performance, their relationships went even better.

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