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The Importance and Utility of the Sociometric Survey Method in Physical Education Research

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Abstract

Sociometry is a way of measuring relationships between people. Sociometric tests can discover, describe and evaluate social status and structure, and can measure the acceptance or rejection felt between sport groups. Subjects within a sport group are usually asked to pick members that they like or prefer working with, or choose their leader, or other variables depending on the context.

The present study evaluates the connections within a school sports team and identifies affinities, mutual choice or rejection between students. These relationships can reveal school group dynamics and the structure and hierarchy of students in a sport group. After analyzing these factors we can determine the group leader, the marginalized individuals, group cohesion and status of each member in the team. The conclusions we can draw from applying our survey method and sociometric test can help us define group cohesion (whether a group is united or divided), group preferences for the team captain or other social problems in the group we want to investigate. By analyzing affinities we can discover and improve group cohesion and can also stimulate positive relationships that can affect the evolution and results of the team. If we want to be successful in the competitive activities we organize in our school, therefore, we must first get to know the relationships within the group, the problems of adaptation, integration and socialization of the students in a group, as reflected in this study.

1. Introduction

Using the survey method in analyzing our school team helped us solve psycho-sociological problems or issues such as relationships between students, group cohesion, choice of team leader, etc. By this method we

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investigated the subjects' views and opinions, perceptions, thoughts, intentions, emotions, impressions, and we got to know how students understood things and to what extent they were mobilized during our activities. Sociological survey techniques are usually used in order to analyze the personality (temperament, character, skills, interests, motivations and opinions).

According to Chelcea (2005), "the sociometric method is much closer to investigative methods, based on the questionnaire technique, the so called sociometric test, used to determine the degree of group cohesion, mutual relations between members of the same group, group structure, hierarchy of members etc. The main means used to discover group characteristics are the study of preferred relations". So we applied a sociometric test to identify the group leader and to measure the affinities, dislikes and feelings of indifference between individuals.

1.1. Purpose

Starting from the assumption that in groups where we find positive relationships (mutual affinities, likes, friendship, cooperation) work is more efficient, we applied the sociometric method that aimed to study the preferential relations in our football school team in order to determine the level of group cohesion and the psycho-sociological elements it is based on.

1.2. Hypothesis

The study started out from the hypothesis that by using survey methods and other specific investigation techniques used in physical education and sports, we will be able to provide a thorough and comprehensive array of information on our school group, on elements such as group cohesion, group leader, marginalized students or other problems that may affect the evolution of our group.

1.3. Study area and methods:

Our sample for this study was the football team of the "Octavian Goga" Elementary School in Răşinari. The group included 10 primary school students, aged between 7 and 11. The test includes some steps that we followed, the students had to fill in a questionnaire in which they had to select the top three and the last three options for team leader in their opinion. Subsequently we analyzed the answers and calculated the indices for group cohesion, social status and preferential status and then built up the socio matrix.

Methods*:* sociological survey, sociometric test, anamnesis interview, interview.

2. Experiment content

We applied the sociometric method on our research group including students aged between 7-11, and we tried to observe the conditions and steps for correct test administration (Chelcea, 1975):

- the first step was to ensure that group members knew each other very well so that they are able to express their real preferences and not random opinion. So our students went through some socialization sessions and background introduction.
- we had to make sure their answers would be honest by reassuring students that their answers will not be revealed to colleagues;
- we had to make sure that preferences would be expressed hierarchically.

Our study tried to investigate the preferences of each student who would like to participate in an activity, either concerning the person who they think could be the team captain, or concerning their participation in educational and fun activities.

We formulated the questions in the following terms:

- "List the top three (or five) colleagues with who you would prefer to (name of the activity)..." Our aim was to identify the leaders and the marginalized students in our group. We assigned a score of 3 points for the top position, 2 for the second and 1 for the third position. We then moved on to processing the answers in order to determine quantitatively preferential relationships. We were looking for social indices such as social status, preferential status, group cohesion.

  According to Chelcea et al., (1993), the sociometric test indices Value of Iss and Isp provide information about the classification of individuals according to way in which they are accepted, rejected or isolated in the group:

- Social status index of A:

$$I_{SS} = \frac{N(A)}{N-1} = \frac{\sum(A)}{N-1}$$ Where $I_{ss} \; \varepsilon \; [0,1]$, N (A) – number of subjects that chose A, N – number of subjects (1)

- preferential status index of A:

$$I_{SP} = \frac{\sum A - \sum R}{N-1}$$ Where $I_{sp} \; \varepsilon \; [-1,1]$, A – number that chose A, R – number that rejected A. (2)

- Group cohesion index:

$$I_{eaf} = \frac{N_S(A)}{N-1}$$ Where N_s (A) – number of subjects that chose A (3)

- Coefficient of group cohesion:

$$C_C = \frac{2 * \sum A_R}{N(N-1)}$$ Where $C_c \; \varepsilon \; [0,1]$ (4)

- Group cohesion index:

$$I_C = \frac{2 * (\sum A_R - \sum R_R)}{N(N-1)}$$ where $Ic \; \varepsilon \; [-1,1]$ (5)

Then we processed the answers to our sociometric questionnaire and built a sociometric matrix based on the summary table. In this table we included the subjects, the votes cast and their preferential order, the points scored and the ranking. Based on the data in the sociometric matrix we calculated the statistical indicators and then built a sociogram. This provides a global overview of group structure, illustrating group cohesion and the position of members in the group.

We built the sociogram by placing the subject who scored the highest number of points (with the highest social status index) in the centre of several concentric circles, and then we placed a subject on each circle, ranked in the decreasing order of points scored. We also marked unilateral and mutual preferences (choices or rejections) on the chart.

The method we applied has the character of a collective inquiry, the subjects' answers (students, athletes) consisting in setting up a hierarchy of the colleagues following the appropriate criteria for choosing a leader (Chelcea and Pătru, 2000).

We required our students to write down the top 3 and the last 3 of their colleagues who they would choose for the position of team captain. The utility of the method is therefore double: develop the subjects' ability to evaluate the psycho-behavioural characteristics of their colleagues and at the same time provide meaningful information for the researcher, which would be more difficult to obtain by other means.

3. Socio-metric test designed and applied on the sport group

The sociometric test designed and implemented on our group had the following form:

1. Date;   2. Number of persons: 10;   3. Max score: + 3;   4. Min score: - 3;   5. Type of test: preference

 Questions:

   1. List in order the top 3 team mates that you would prefer in the position of team captain:
   1. .... (+3)
   2. .... (+2)
   3. .... (+1)

   2. List in order the first 3 team-mates who you would reject for the position of team captain:
   1. .... (-3)
   2. .... (-2)
   3. .... (-1)

The test was preceded by a 5-minute training that included information about the following elements:

   1. Confidentiality of the test
   2. The need to limit the number of preferences and rejections to 3
   3. Ban on any kind of communication or exchanges of glances between subjects
   4. After having completed the questionnaire, ban on communicating the colleagues chosen or rejected

4. Results

   The next step in our research was to centralize our students responses and build up the socio-matrix. In Table 1 we listed the subjects with their initials in the first column and assigned a number to them in order, then we noted their preferences. In Table 2 we built the socio-matrix that reflects all the rejections and elections in the form of a matrix.

Table 1. Table on elections and rejections

Subjects	+3	+2	+1	-1	-2	-3
AV (1)	6	10	7	4	3	5
BD (2)	8	10	7	5	4	3
CN (3)	6	9	1	8	4	5
DV (4)	6	7	5	9	10	8
PN (5)	8	10	6	9	3	1
PP (6)	2	10	7	3	9	5
RA (7)	6	4	9	2	10	8
SB (8)	6	2	7	5	3	4
SG (9)	8	2	6	5	4	3
TI (10)	8	6	2	5	3	9

Table 2. Socio-matrix

Sub.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1			-2	-1	-3	+3	+1			+2
2			-3	-2	-1		+1	+3		+2
3	+1			-2	-3	+3		-1	+2	
4					+1	+3	+2	-3	-1	-2
5	-3		-2			+1		+3	-1	+2
6		+3	-1		-3		+1		-2	+2
7		-1		+2		+3		-3	+1	-2
8		+2	-2	-3	-1	+3	+1			
9		+2	-3	-2	-1	+1		+3		
10		+1	-2		-1	+2		+3	-3	

We then calculated the social status and preferential status indices:

Table 3. Social status and preferential status indices

Indices/ Students	AV(1)	BD(2)	CN(3)	DV(4)	PN(5)	PP(6)	RA(7)	SB(8)	SG(9)	TI(10)
I_{ss}	1/9	4/9	0	1/9	1/9	8/9	5/9	4/9	2/9	4/9
	0.11	0.44		0.11	0.11	0.88	0.55	0.44	0.22	0.44
I_{sp}	0	3/9	-7/9	-4/9	-6/9	8/9	5/9	1/9	-2/9	2/9
		0.33	-0.77	-0.44	-0.66	0.88	0.55	0.11	-0.22	0.22

- The social status index:
$$I_{SS} = \frac{N(A)}{N-1} = \frac{\sum (A)}{N-1} \qquad (6)$$

- Preferential status index of A:
$$I_{SP} = \frac{\sum A - \sum R}{N-1} \qquad (7)$$

- Group cohesion index calculation:

A_r = 5 2 – 8   2 – 10   4 – 7   6 – 7   6 – 10 A_r – mutual elections   (8)
R_r = 6 1 – 5   3 – 5   3 – 8   4 – 8   4 – 9   5 – 9 R_r – mutual rejections   (9)

- Coefficient of group cohesion:

$$C_C = \frac{2*\sum A_R}{N(N-1)} \quad = \quad \frac{2*5}{90} \quad = \quad \frac{10}{90} \quad = \quad 0.11 \tag{10}$$

- Index of group cohesion:

$$I_C = \frac{2*(\sum A_R - \sum R_R)}{N(N-1)} \quad = \quad \frac{2*(5-6)}{90} \quad = \quad \frac{2*(-1)}{90} \quad = \quad \frac{-2}{90} \quad = -0.02 \tag{11}$$

The Sociograms

Sociogram elections and mutual rejection: Sociogram type: Target
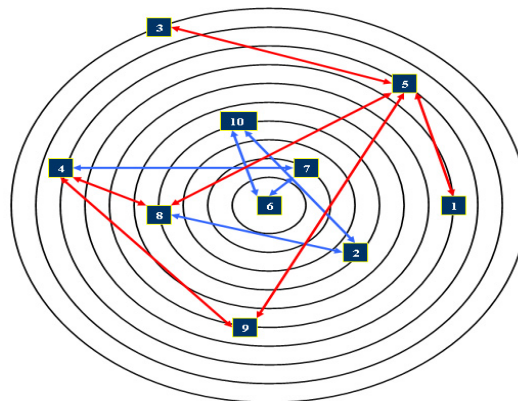Vectors used: - reject each other ←———→ - choose each other ←———→
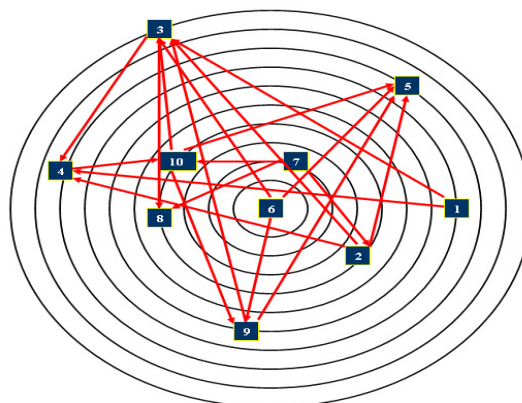

Fig. 1. Sociogram elections and mutual rejection

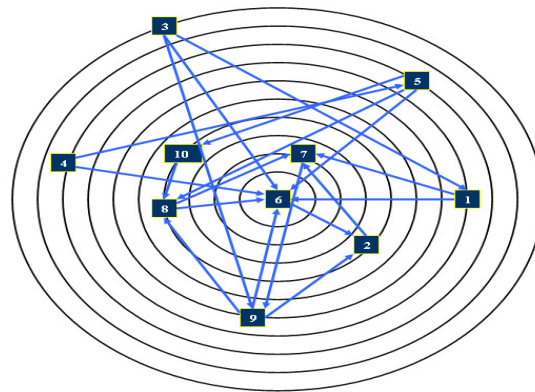Fig. 2. Sociogram unilateral   rejections

Fig.3. Sociogram unilateral election

5. Conclusions

Conducting this study highlighted the importance of the survey method in scientific research in the field of Physical Education and Sports. The method presupposed mainly an analysis of the psychological, sociological or pedagogical characteristics of field data problems.

The group constitutes the basic psychosocial reality of sports activities, its cohesion and capacity depending very much on the performance and satisfaction of the athletes. The commonly known group situations can be characterized as "united", "divided", "confused" or working to acquire a personality (Golu, 1988).

The study had as a research sample the football team of our school and used socio-metric survey as the main tool of investigation. Following the analysis and interpretation of the results we can draw the following conclusions:

- We find the used of the survey method very useful in our sports research for analyzing psychological and sociological problems such as the choice of team leader or captain. We identified student PP as the leader of our group, as he was the most frequently chosen by the others, with a good social status (Fig. 1) and a social index of 0.88 (Table 3). On the other hand, student CN was the least likely to become team captain, as he obtained many rejections and got a social index of -0.77 (Table 3).
- The sociometric test allowed us to identify the favourite people with the best social index. The top rank was taken by PP, the potential captain (Fig. 3) with a social index of 0.88 (6) (7). RA (Fig. 3) came second with 0.55 (6) (7) and BD third (Fig. 3) with 0.33 (6) (7). The most rejected students, unlikely to become team captains and leaders were: CN (Fig. 2) with a social index of -0.77, PN (Fig. 2) with -0.66 and DV (Fig. 2) with -0.44. We have also found out the level of interpersonal cooperation: five mutual elections (8) and six mutual rejections (9), therefore we could set up a group hierarchy which helped us optimize the interaction between preference relations and functional relations within the group, for the purposes of mutual adjustment.
- As we have seen, group cohesion (Cc) is slightly positive (10), but the most important parameter - the group cohesion index - is negative (11) so our group is not really united. By knowing group preferences, rejections and elections between members (Fig. 1), we could help reorganize the group based on the informal structure revealed by the sociometric test.
- Using methods of inquiry is necessary, especially if we are interested in the opinions, attitudes and motivations of our group members. This method can help us identify group preferences concerning various elements, such as who the group would like to have as a captain or who is less appreciated in the group.

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