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The Rules for the Jury of the Fryderyk Chopin Piano Competition as a Non Standard Voting Rule

Abstract
Game theoreticians usually deal with some standard voting methods such as plurality voting or approval voting. In reality however, some non standard more complex voting methods are used. In this paper we shall present the voting method used by the jury of the International Fryderyk Chopin Piano Competition. The voting method is very complicated and unclear. We present some unexpected effects of such a complicated voting rule.
Keywords: voting, classical music competition

1. Introduction

A lot of different voting methods are applied in both social and economic situations. The most popular are majority voting, plurality voting, ranking methods and approval voting.

We shall study a situation where voters have to choose a given number of alternatives from a whole set of alternatives. First we present majority and plurality voting. Voters vote for a given number of alternatives. Then the number of votes is counted for each alternative. The alternative with the highest count wins in the plurality voting. In the majority voting, the alternative that gets more than 50% of votes wins. In ranking methods voters assess points to every alternative. A scale is given. Then for every alternative the obtained points are counted and the alternative with the highest score wins. There are also different possible methods of determining the winner in ranking voting. Approval voting is a simpler one. Voters vote "yes" or "no" for every alternative. They can vote "yes" as many times as they want. Then, for every alternative the number of "yes" votes is computed. The alternative with the highest number of "yes" votes wins. The reader can find more about voting methods in Nurmi (1987). Approval voting is presented in Brams and Fishburn (1983)

There are also situations, mostly in sport and music, where very sophisticated methods are used. The methods used in sport were analyzed by Gambarelli (2008, 2012), Przybysz (2000), Tyszka and Wielochowski (1991). The author did not find papers about voting methods used in classical music competions. In this paper we analyze one of the methods used in classical music competitions. We try to define the origin of the method and point out some of its consequences.

The analyzed method is the one used by the jury of the International Fryderyk Chopin Piano Competition. It is a complicated mixed method which combines ranking method and approval voting. The combination used results from the question of equal treatment of each voter and diminishing the significance of extreme votes.

Some unexpected results are observed. The method used by the jury leads to situations where its application is impossible. The method may also cause a weaker competitor to be assessed higher than a better one. The Pareto unanimity principle is not fulfilled.

The paper is constructed as follows. In Section 2 the rules for the jury voting of the competition are presented. The analysis of these rules is to be found in Section 3. The conclusions are formulated in Section 4.

2. The Rules for Jury of the Sixteenth International Piano Chopin Competition

Jury rules are formulated for each edition of the competition separately. The observed trend of construction is connected with complication of the rules. In this paper we shall analyze the rules for the 16 th edition held in 2010. There were 13 jurors and 78 competitors.

The competition consists of 3 stages and the final. The rule defines the upper bound of the number of competitors admitted to each stage and to the final. In every stage the competitors' performance is assessed according to two systems: points awarded and 'yes/no'. The 'yes/ no 'system is considered to be the primary system. In the final only the point system is used. In both systems jurors can not asses the performance of their own students throughout the competition. There is a precise definition of what a "student" is.

In the 1st 2nd and 3rd stages the point system involves the assessment of the performance on a scale from 1(the lowest) to 100 (the highest). For each competitor the arithmetic mean (AM) of obtained points is computed. Then, the correcting procedure begins. If the number of points awarded by one of the jurors deviates from the arithmetic mean of the total points obtained by the pianist in a given stage by more than the following:

- 10 points in stage 1;
- 8 points in stage 2;
- 6 points in stage 3;
- 5 points in the final,

then this assessment is excluded. A second, auxiliary arithmetic mean (AAM) is computed on the basis of all marks which have not been excluded. More cor-

rections follow. Now, all the marks falling outside the above specified norms of deviation from the auxiliary arithmetic mean are corrected to the nearest whole number within this norm. Finally, the determinant arithmetic mean (DM) is then obtained from the marks corrected in this way.

In the stages 1, 2, 3 the juror writes 'yes' or 'no' by the names of those competitors whom he/she considers the best. The number of 'yes' votes are defined for each stage (40 in the first stage, 20 in the second stage and 10 in the third stage) the numbers are the upper bounds of pianists admitted to a given stage. The 'yes/no' system is connected with the point system. The juror writes 'yes' if and only if he/she assigns at least 75 points to the pianist.

In stage 1 after the necessary computation the secretary of the jury presents to the jurors the overall results of the audition in the form of a list of the number of 'yes' votes obtained (ordered from the highest number to the lowest with additional information about jurors' students and other indicated absence in voting) and the determinant arithmetic mean of the points awarded but without the competitors' names. On this basis the jury, after any ensuing discussion, decides by open ballot which competitors to admit to the next stage.

In stage 2, after the necessary computation the secretary of the jury presents to the jurors the overall results of the audition in the form of a list of the number of 'yes' votes obtained (ordered from the highest number to the lowest with additional information about jurors' students and other indicated absence in voting) and the sum of the determinant arithmetic mean of the points awarded in stages 1 and 2 but without the competitors' names . On this basis the jury, after any discussion that may ensue, decides by open ballot which competitors to admit to the next stage

In stage 3 after the necessary computation the secretary of the jury presents to the jurors the overall results of the audition in the form of a list of the number of 'yes' votes obtained (ordered from the highest number to the lowest with addition of being a student of jurors and other indicated absence in voting) and the sum of the arithmetic mean of the points awarded in stages 1, 2, 3 but without the competitors names. On this basis, and again after any discussion required, the jury decides by open ballot which competitors to admit to the final.

After the final audition only the point system is used, within the range of 75-100. Only the performance in the final is assessed. Afterwards, the *determinant arithmetic mean* is computed. Then, the secretary of the jury presents the sum of the *determinant arithmetic mean* obtained in all four stages by the competitors who played in the final. The results are ordered from the highest to the lowest. The names of competitors are not known. On this basis the jury decides on the award the prizes.

3. Analysis of the rules for the 16th International Fryderyk Chopin Piano Competition

Let us analyze how the point system works. In table1 we present the assessment of 3 pianists made by 3 jurors. We consider stage 1, where the norm of deviation is 10.

Table 1. Example of correcting procedure. Lack of monotonicity

Pianist	A	B	C
Juror 1	70	60	75
Juror 2	45	60	35
Juror 3	85	85	85
AM	66.6	68.3	65
AAM	70	60	75
Corrected Juror 1	70	60	75
Corrected Juror 2	60	60	65
Corrected Juror 3	80	70	85
DM	70	63.3	75

Source: Author's work.

Let us consider pianist A. His arithmetic mean (AM) is 66.6. So the assessments of juror 2 and juror 3 are outside the norm (they are higher or lower by a figure greater than 10 of the AM). Then, the assessments of jurors 2 and 3 are excluded when computing the AAM. Only the assessment of juror 1 is taken into account. So, the AAM is equal to 70 – the assessment of juror 1. Now, the assessments of jurors 2 and 3 are corrected. They are replaced by the full number which is nearest to the AAM +10 in cases where the number of points is greater than the AM +10 and the AAM −10 and when the number of points is lower than the AM −10. So, the corrected number of points are 70, 60, 80 and their mean (DM) is 70. The same procedure follows for pianists B and C. The highest determinant mean (DM) is obtained by pianist C, whose arithmetic mean (AM) was the lowest. So there is a lack of monotonicity between the AM and DM.

Now, let us change assessments of pianist B preserving the order of the jurors' assessments. Note the table 2.

The jurors' assessments are ordered in the same way as in the examples presented in tables 1 and 2. The DMs are ordered differently in these examples. Considering DMs pianist B is third in the example of table 1 and second in the example of table 2. The voting method is independent of irrelevant alternatives if the following condition is satisfied: If two profiles of individual preferences are the same on a pair of alternatives then the social preferences connected with these two profiles are also the same. In our case the order of individual assessments are the same for the example presented in tables 1 and 2. Therefore individual

preferences are the same for pianists A and C. The order of these pianists given by DM presented in table 1 is different from that in table 2, so the condition of independence of irrelevant alternatives is not fulfilled.

Table 2. The order of DMs does not depend on the order of the jurors assessments

Pianist	A	B	C
Juror 1	70	69	75
Juror 2	45	69	35
Juror 3	85	85	85
AM	66.6	74.3	65
AAM	70	69	75
Corrected Juror 1	70	69	75
Corrected Juror 2	60	69	65
Corrected Juror 3	80	79	85
DM	70	72.3	75

Source: Author's work.

The Pareto principle is a property that voting systems usually aim to fulfill. The Pareto principle says that if all voters prefer one alternative to another than the voting system chooses that alternative. The analyzed voting rule does not satisfy the Pareto principle. Let us study the following example (table 3).

Table 3. The Pareto principle is not fulfilled

Pianist	A	B
Juror 1	70	69
Juror 2	87	84
Juror 3	70	69
AM	75.6	74
AAM	70	74
Corrected Juror 1	70	69
Corrected Juror 2	80	84
Corrected Juror 3	70	69
DM	73.3	74

Source: Author's work.

Let us note that all jurors assess a higher number of points to pianist 1. Jurors 1 and 3 give 'no' votes to both pianists, juror 2 gives a 'yes' vote to both pianists (a pianist obtains 'yes' if and only if he/she gets at least 75 points). So, the difference is only in the point system.

The system of voting presented in the previous section is very complicated and non-transparent. Some reasons for such a construction may be found in the

interview with the chair of the jury. He presented the benefits of such constructed rules in the following way (the interview with Andrzej Jasiński, the Chair of the jury (the competition newspaper, see Web 2)).

"The journalist (Marcin Majchrowski, Polish Radio):

– Since 2000, the use of an arithmetic mean has been given up. Is this a revolutionary change?

The chair:

– It is a very good change because, to put it simply, it requires a yes or no vote. A democratic majority decides, just like in elections. However, there is a point system that helps, one that judges can reference in case of a tie. Remember that jurors cannot judge their own students, and there are fewer votes. That is when the backup point system can be used.

The journalist:

– That is how it works up to the third round. In the final it is the total number of points that decides, so does that mean there will be no majority vote to place the winners?"

The chair concentrated on the fact that jurors did not asses their own students and that decisions were made by the majority of voters. He did not consider the details of the voting method. These details influence the decision making process and render it intransparent. The chair did not mention that the yes/no system is connected with the point system. A juror can vote 'yes' to a competitor only when he/she gave him at least 75 points. Thus, the point system creates limits for the yes/no system. Moreover, there are limits of the 'yes' assessment constructed by the upper bound of competitors in the next stage. Taking these facts into account it is difficult to say that the yes/no system is the basic system. The point system is the basic system. The yes/no system is seemingly similar to approval voting by using the assessment 'yes/no'. In approval voting, the number of 'yes' votes is unbound and does not depend on other assessments.

This voting system has some unexpected consequences.

Łój (2011) analyzed the voting system on some examples. She showed that the system of the correction of means implies some contradictions. She considered a hypothetical situation where 10 jurors evaluate 6 competitors. We consider the first stage with the deviation norm of 10. The *arithmetic means*, *auxiliary arithmetic means* and *determinant arithmetic means* are presented in table 4.

Let us note that it is not possible to compute the auxiliary and determinant means for competitor 6. All his points deviate from the arithmetic mean by more than 10 points. So, the domain of the voting method is restricted. Of course, it is not very likely that there will be a competitor with such extreme opinions. In this voting system very high and very low assessments are taken into account only when they are close to the mean. So, it is better not to asses a competitor

very high or very low if a given juror wants his opinion to be taken into account. A juror should vote strategically if he wants his opinion to be significant. It is contradictory to the postulate that a voting system has to be as little manipulable as possible.

Table 4. Impossibility of computing AAM and DM

competitors → jurors ↓	1	2	3	4	5	6
1	95	70	100	100	100	90
2	95	70	80	90	85	90
3	70	70	65	80	80	90
4	70	70	65	80	75	90
5	70	70	65	70	70	90
6	70	70	65	70	65	50
7	70	70	65	60	65	50
8	60	70	65	50	55	50
9	60	70	65	50	55	50
10	40	70	65	50	50	50
AM	70	70.00	70.00	70.00	70	70.00
AAM	67.14	70.00	66.67	72.00	71.00	##
DM	68.20	70.00	67.20	71.20	70.00	##

Source: Łój (2011).

The above example is not the unique contradiction of the voting system.

In table 5 Łój presents a hypothetical example of connections between the point system and the yes-no system. Let us remind ourselves that 'yes' can only be given to those competitors who obtained at least 75 points. So, competitor 1 receives all 'yes' votes and competitor 2 only half of the 'yes' votes. Competitor 1 has a better chance of being admitted to the next stage in spite of the fact that competitor 2 has a significantly higher mean.

The connections between the point system and the yes/no system implies that neither of the systems works separately or is sufficient for making a group decision. Different voting systems apply different cognitive effort (Malawski et al., 2010). There is an open question to whether a mixed use of different voting systems may cause some confusion in decision making. Moreover, the connections between the point system and the 'yes-no' system are not the unique controversy of the voting system. Let us note that jurors make a group decision considering anonymous numbers of 'yes' votes and the sums of the determinant means. It is quite possible that in such a situation people could make their decision in a different way than if they knew the names and took into account the complete information about competitors.

Table 5. The point system gives a significantly better assessment than the yes-no system

Competitor → Juror ↓	1 points	1 yes-no	2 points	2 yes-no
1	75	yes	85	yes
2	75	yes	85	yes
3	75	yes	85	yes
4	75	yes	85	yes
5	75	yes	85	yes
6	75	yes	74	no
7	75	yes	74	no
8	75	yes	74	no
9	75	yes	74	no
10	75	yes	74	no
result	75	100%	79.5	50%

Source: Łój (2011).

Stec (2012) described an experiment on the choice of an excursion abroad. The respondents chose a preferred excursion two times. The first time, they could read descriptions and assess points to every excursion. The second time, they only knew the mean of points obtained in their first choice without any other information about the excursions. The results of the choice were different. In the second choice respondents concentrated on excursions with the highest means. The order of preferred excursions was also different.

In conclusion we can say that the correcting procedure joined with a mixture of two different systems favors assessments close to the mean, moreover the rigor of anonymity makes these assessments even closer to the mean.

4. Conclusions

The considered example of non standard voting methods is constructed with a vision of effectiveness, transparency and simplicity. The above analysis of its properties may show that the complication of the construction of the method is followed by some unexpected properties. The Pareto principle of unanimity is not fulfilled, some individual preferences lead to insolvable questions or to a situation where a weaker competitor is assessed higher than a stronger one. The mixed method of voting together with the very complicated voting system are the causes of such properties.

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Regulamin obrad Jury Konkursu Chopinowskiego jako przykład niestandardowej metody głosowania

Abstrakt

W teorii gier zwykle zajmuje się standardowymi metodami głosowania, takimi jak głosowanie większością czy głosowanie aprobujące. W praktyce pewne nie standardowe, skomplikowane metody głosowania są używane. W tej pracy prezentujemy metodę głosowania jury Międzynarodowego konkursu im. Fryderyka Chopina. Jest ona bardzo skomplikowana i niejasna. Pokazujemy pewne nieoczekiwane rezultaty tak skomplikowanej metody.

Słowa kluczowe: głosowanie, konkursy muzyki klasycznej

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