

REVIEW

on the dissertation of IVAN KOSTADINOV YANAKIEV

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On the subject:

THE CONCERT SYSTEM $A^1 = 432$ HZ AND THE OPEN FIFTHS: AN ATTEMPT AT INTEGRAL ACOUSTIC, PSYCHOPHYSIOLOGICAL, COGNITIVE AND PRACTICAL RESEARCH

for acquiring the educational and academic degree *doctor*

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Ivan Yanakiev's dissertation is on the subject of a sound object, that lies at the cross-point of acoustics and psychology while the concrete possible subjects lead "inside" – towards psychophysiology as well as "outwards" – to the vast field of music culture in its historical, sociological, cognitive and creative aspects. In this sense, I find that the topic of research is extremely well formulated - it fixes the exact parameters of the study and at the same time arouses in the reader spontaneous professional curiosity with what motive and with what ultimate goal the author will cover the problems.

The dissertation has a total volume of 314 pages: introduction, 7 chapters and a conclusion (with a total numbering from 1 to 9 and a volume of 237 pages), appendix and bibliography, including 18 titles in Cyrillic and 113 in Latin.

Before focusing on the specific content of the paper, I would like to highlight two factors that I believe should be leading in the evaluation of this study.

First, in the field of musicology we rarely come across works of this type. With the exception of cases where individual researchers have in turn resorted to acoustic argumentation in support of a particular question, most contemporary music theorists shy away from this issue. Approximately from the end of the 18th century, when professional music performance began to be actively profiled in the tracks of composition, performance, music science and pedagogy, the interest focused on the immanent-musical. The figure of the universal baroque musician, tuning his own keyboard instrument, became history, and the practical skills, and hence the scientific awareness of acoustics, were transferred to physicists and acoustics. Today, the current musicians, as well as the huge percentage of musicologists do not have the basic competencies to understand the acoustic side of music (if we exclude the overtone

order constantly exploited on various occasions). I have always believed that music theory has suffered and continues to suffer huge losses, placing the problem of the musical system on the periphery of scientific interest (and somewhat by logic, that grapes that are high are sour ...). *In the context of the circumstances set out, any effort in this direction deserves, in my view, to be described as an event. That is why I can boldly engage with my first statement that the dissertation we are considering is on a significant, highly scientific and much-needed topic.*

Second, the research and study of such issues requires the involvement of diverse methods, and this implies a rich and precisely coordinated methodology. The author, who worked with true scientific passion, had a spontaneous clarity about the ways and means that most naturally and most directly lead him to the answers sought. Probably that is why he has not yet fully realized the research methodology he has applied as his own contribution (in his self-reflections he more actively emphasizes the importance of the used tools). For me, however, *one of the great contributions of the work is the successful combination of verbal and formal scientific language, mathematical models and cultural approaches, statistical, analytical and interpretive methods, as well as the activated action of the two general scientific approaches - theoretical and empirical.* In general, the organization of the developed experimental activity and the derivation of visible results from it must be taken out in brackets. At the same time, experiments have a double potential: they test and at the same time generate hypotheses.

The chapter "The Concert La (A) - History of Standardization and the State of Modern Practice" is important for the coverage of the research object - its significance and the logic by which it reaches us in its current state. Historically, the problem is related to many factors and the author is able to trace them, taking into account the role of liturgical practice, organ building, the development of trade in modern times, etc. I think this text is very successful and although at times it resembles exposition in a textbook has a high coefficient of information.

Of particular importance are the sections on pp. 18 - 25, where the doctoral thesis on the phenomenon of concert formation is presented quite confidently. It is here that the author recognizes the choice of concert style as "one of the fine-tuning of the common music system of every musician" and as an equal element of musical expression. This leads to the following key idea: "In this sense, the concert system could be seen as a means of expression through which certain authors, performers, ensembles or orchestras would like to show specifics in their sound." I fully share this idea, and the author substantiates it with the general thesis that today, in fact, external standards do not exist sustainably. Regarding the concert system itself $a_1 = 432$ Hz Yanakiev finds a firm theoretical argument in the so-called "philosophical system", which has as a foundation of the musical system the philosophical "C" - 1 Hz, and defines as one of his contributions the definition of the concept infra octave, referring to the four octaves from 1 to the non-human auditory organ tone 16 Hz.

The content of chapter "Tempering and Intonation" is of key importance for the dissertation, as it directly covers the concrete dimensions of the research subject and realizes one of the important contributions of the work, formulated by the author as follows: *"Develops mathematical models of tempering and applies in practice, the model in the graphical visualization of tempering and in the generation and modeling of sound representations of the tempering considered in the work"*. Ivan Yanakiev presents in great detail the methodology and technology of the possibilities developed and used by him for the reproduction of three acoustic variants of the music system: two different concert sets plus a version with open fifths (after Maria Reynold). For the purposes of this activity he has invested in specialized training - in June 2018 within the project "Tempering and Intonation Systems in the 20th Century" Yanakiev completed a distance learning course in MatLab at **Stanford** University, which helped him to refine the program codes which he includes in his dissertation.

The experimental chapter has an essential role in the collection and processing of empirical material. It starts with an extremely interesting section to which I will return later.

The empirical research conducted and presented in the dissertation with the choristers from the choir of medics "Rodina" and with professional instrumentalists aims to establish their subjective assessment (including the feeling of localization of sound on the body) of music performed / listened to in concert with value of tone a1 440 Hz and 432 Hz, as well as an attempt to reproduce the temperament with open fifths. *The experiments are highly and diversely informative and therefore I will pay special attention to them.*

It is important to emphasize that Ivan Yanakiev has undertaken an extremely complex task - both as a concept, and as a preparation of musical material, and as an organization of research. *I am sincerely delighted and congratulate the author for this work, which has no analogue in our research practice!*

Of course, in order to rely on any relative authenticity, this kind of research requires large samples of general information and repeated reproduction of the experiment. This in turn presupposes a resource of objective preconditions, which are not available in our conditions. In this sense, the experiments are of the "pilot" type of research, which are carried out with smaller samples and without strict control over the so-called. "external variables". On the other hand, studying with smaller samples has its advantages, which are expressed in the active role of monitoring and in the possibilities for qualitative analysis. A great advantage is that Ivan Yanakiev conducts experiments in the process of live music or through the perception of music and at that of works from different eras and styles.

The information about the subjective reaction to the musical order is extracted through surveys. In principle, the questionnaire method is not among the reliable ones, as it is

declarative and usually strongly influenced by conscious or unconscious side motives and attitudes. Personally, I am skeptical above all about the questions that require an answer yes / no - they hardly give completely reliable information about the real auditory impression and experience. The questions related to the subjective feelings of the respondents should not (in my opinion) be asked with sample answers, so as not to manipulate the spontaneous associations. It was probably not necessary to use professional terminology in the choir experiment. I would be more trustworthy if the auditory impressions were diagnosed in the order of the tasks performed in the rehearsal process, without sharpening the attention at which moment in which system the music is played.

It seems to me that when he conducted his experiments (in the period 2015 - 2017), Ivan Yanakiev was driven by a strong desire to draw through the polls the conclusion of a clear preference for the system 432. Probably because the author very accurately processes quantitative data by using the possibilities of alternative analysis. In this case, correlation analysis would be successfully applied - an untapped opportunity, which remained at the level of percentage expressions.

These reflections of mine are not critical. On the contrary - *it is in its current form that the experiments conducted and described by Ivan Yanakiev provide abundant material for conclusions, which also contain a perspective for improving future experimental activity in the outlined direction.*

For me, the results of the open-ended questions, which have the potential for more in-depth content analysis, have a higher value in the first experiment. That is why I do not share the author's slight disappointment that the quantitative results are not so convincing. I do not share the conclusion that such experiments should be done with professional musicians. The fact that preliminary expectations have not been met to the maximum does not mean that the results are not contributing. *I consider the "choral" experiment as useful and beneficial for professional readers! I believe that the enormous efforts made by the researcher have been fully justified, and the results even go beyond the specific objectives.*

Similar to the first experiment, the experience with instrumentalists is just as meaningful and versatile. I will not dwell on all its aspects, because in this place I prefer to move to a more general view. To this end, I will return to the beginning of this chapter, where the author has drawn out perhaps the most useful thesis on the ethos of the various pitch levels in music. There is a remarkable quote from a text by Mattheson. Some time ago in the book "The Idea of Harmony ..." I hypothesized that when the ancient ethos comments on the ethos of the various "harmonies", it is possible to refer not to the types of octaves (called modes by us), but tonos, denoted by the same terms (Dorian, Phrygian, etc.). Until now, I did not know the quote from Mattheson proposed here and I am very impressed, because obviously the ethos interpretation of the pitch levels (tones, tonalities, musical systems) has serious grounds. And it is through this

lens that I am most interested in the trends highlighted through Ivan Yanakiev's experiments: *the feeling of the systems as carriers of a certain ethos, the notion to make sense of the musical system as a means of expression, stylistic and aesthetic reactions with a preference of $a1 = 432$ Hz baroque and $a1 = 440$ Hz compared to the music of the twentieth century.*

Here I will emphasize again that the experimental activity developed by Ivan Yanakiev is a serious contribution of the dissertation both with the achieved results and with the natural imperfections, which encourage reflection and strengthen the interest in the issue!

The chapter entitled "The Relationship Between Speech Intonation and Music" raises a very important question. I believe that such an aspect has its rightful place in such a study. From the analyzes of the sound recordings carried out in the DG, it is established that among the five groups only one is intoned in the system 440 and this fact is again reported by the dissertation in quantitative terms. This provoked me to formulate two questions to him: 1) could he offer today a hypothesis why children from the fourth group of kindergarten intone at this height and 2) was there any different context in the activities conducted with the children, who could explain the difference between the intonation of the two 4 groups?

Chapter number six contains essential information that deals with the question of the neurophysiological mechanisms that determine auditory perceptions. It is the basis for the formation of a hypothesis and a theoretical project for possible future research in order for the subjective feelings to receive an objective justification. Undoubtedly important and interesting are the observations on the composer's experience in the direction of the concert line $A^1 = 432$ (chapter "Composers' Decisions"), as well as the personal correspondence with the composer Dr. Coreen Morsink, as well as the realized analyzes. This perspective is very necessary for the dissertation research, as it rounds off the issues with the aspects of creative practice.

In the conclusive part of the text the author presents the achieved results in the order of the goals set out in the introduction. The "Open Finale" of the dissertation is completely justified, as its general contribution is in the analysis of a problem that contains a perspective for the development of research work.

The high publishing and project activity of the author of the dissertation must be taken into account: two studies, eight articles and reports; participation in 13 conferences, lectures, two projects. This in itself shows that the author has discovered a field of lasting scientific interest, which will certainly will bring to life new interesting significant ideas.

Congratulations to the dissertation author and the supervisor - Prof. Dr. Mirena Bozhikova, for the original research, which impresses with its scientific courage and innovation!

In conclusion, I would like to give my professional support and offer to the esteemed academic jury to award Ivan Yanakiev the educational and scientific degree "Doctor".

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