

STRATEGIES AND SUGGESTIONS FOR SINGING IN FOREIGN LANGUAGES BASED ON PHONETIC MUSICAL NOTATION

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ABSTRACT

There are different approaches to a good pronunciation when singing in foreign languages. One promising example is the use of the International Phonetic Alphabet (IPA). Transcribing lyrics with this alphabet has a tradition of several decades, but it can be very time-consuming when done manually, especially if you want to store IPA information directly within a score. We investigated, for what musicians the use of IPA is useful and what they normally do when singing in foreign languages. In a questionnaire with more than 450 participants from 19 different countries we asked singers and conductors about their strategies when singing in a foreign language and whether they thought it was useful to have IPA inside a score. We identified a variety of strategies which are used for singing in foreign languages like listening to recordings or to experts of the target language. Additionally, 60-70 % of all participants and 90 % of opera singers think that a phonetic alphabet could be helpful in a score. Test subjects were also asked to name the languages they wanted as transcriptions in the notes, where Russian was second to none. As a consequence of these results, we are working on an automated approach for writing IPA information directly in MusicXML data, thus combining IPA transcription with the original score.

1. INTRODUCTION

Using the International Phonetic Alphabet (IPA) for transcribing lyrics has a tradition of several decades, but it can be very time-consuming when done manually – especially if you want to store IPA information directly inside a score. To investigate the acceptance of IPA notation in scores among the music community, we ran a questionnaire study with 457 participants from 19 different countries, aged between 17 and 83. We asked singers and conductors about their strategies when singing in a foreign language and whether they thought it useful to have IPA inside a score. As a solution for this linguistic problem of singing, we are working on an automated approach for writing IPA information directly in MusicXML data, thus combining IPA and the original score. Firstly, we will describe the history of using IPA for singing and the linguistic issues

that arise when singing in different languages. Then, we introduce the structure of our online survey, and discuss our participants' answers. Finally, we will conclude with a short summary and an outlook on our technical approach which we developed for storing phonetic information into a score.

2. LINGUISTIC ISSUES AND A HISTORY OF USING IPA FOR SINGING

In linguistics, the fields of phonetics and phonology are concerned with the pronunciation of sounds in all languages and their physiological constraints. How and for which reasons speech sounds are formed are the central questions in this area. Furthermore, they investigate and describe sets of sounds and rules about them in individual languages. One of their most important tools is the International Phonetic Alphabet (IPA) [1]. For singing, we must consider some additional rules (that would not be appropriate for speaking) to account for the adjustment of phonetics and phonology, because spoken and sung sounds are often different:

One of the most widespread errors is that spoken and sung sounds are the same. Nothing is further from the truth. [...] The adjustment of phonetics to the vocal phrase is the real problem for any accompanist and coach and the solution constitutes a very important part of this art. [2, p. 5]

The Austrian-American conductor Kurt Adler, who wrote these remarks, was among the first people to take an interest in IPA regarding musical lyrics. He wrote about using IPA for singing in different languages already in the 1960's. A further pioneer was Berton Coffin in the 1970's [3]. He explained physiological characteristics of singing for breathing, vowels and consonants. He wrote further books about singing in Italian, French, and German [4]. If we read such literature, we must be aware that there is a continuous development of the phonetic languages and that there are often different schools for singing in a particular language. Therefore, it is often difficult to identify a common rule set for singing. Since the 1990's, Nico Castel has translated and transcribed Italian, German, and French opera libretti, which have set the standard for vocal literature today. Further literature for singing with IPA is available for Latin, old French, old English and many other languages [5, 6, 7, 8].

In these 50 years of efforts of using IPA for transcribing musical lyrics, the lyrics were always separated from the musical score. In our view, the logical consequence of this development is to use IPA directly in musical sheets, which is not a standard procedure in classical music yet. Nevertheless, there are various problems with storing IPA information in a score. The transcription itself is difficult because there are different orthographic texts and simple one-to-one descriptions of the pronunciation are not possible for these texts. Furthermore, one must consider many languages with complex linguistic rules, like the syllable-final obstruent devoicing in German. Additionally, rules that apply specifically to singing must be accounted for. Diphthongs in German, for example, are to be transcribed differently for singing than for speaking and the distribution of syllables might differ from that for speaking.

3. QUESTIONNAIRE

The online questionnaire in German and English described in this chapter was created in November 2018 [9]. In a first step, the three-part structure of the questionnaire is explained. Subsequently, the questionnaire is systematically evaluated on the basis of this structure.

Firstly, socio-demographic data of the participants will be analysed. Then, strategies for singing in foreign languages and the evaluation of phonetic transcription in the scores will be discussed.

3.1 Design

At the end of the questionnaire, we asked the participants about their proficiency concerning singing in general. Here, we were also interested in socio-demographic data, like age, gender, country of origin, or profession of our participants. In the second part, we asked about strategies for singing in foreign languages. The most common approaches to such pieces of music are determined by means of Multiple Choice. Another Multiple Choice and a Single Choice question clarified what kind of annotations the participants use when singing in foreign languages and whether they are familiar with the principle of phonetic transcription. There was always the possibility of free text input. The third part was about evaluating the usefulness and value of using IPA in scores. In addition, it was determined for which languages, pieces and genres a transcription in the scores is desired. These questions were again based on multiple choice, a rating scale and free text information.

3.2 Sociodemographic data and self-assessment

457 participants from 19 different countries, 280 female, 171 male and six persons with undefined or diverse sex took part in this survey over a period of almost three months. 396 test persons came from Germany, 12 from Austria, ten from Switzerland, nine from Sweden, three from the USA, three from Slovakia, and further participants from Belgium, the Netherlands, Italy, the UK, Uruguay, Spain, Norway, Lithuania, Israel, Denmark, the Czech Republic, China, Bulgaria or from other countries not marked.

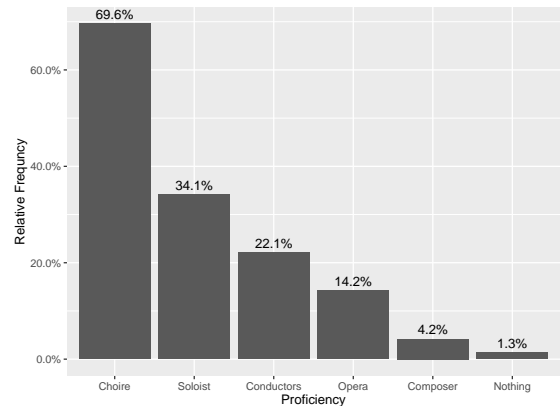


Figure 1. Participating choir singers, soloists, conductors, opera singers, composers, and participants who did not identify with these options - Question 9. This being a multiple choice question, the percentages need not add up to 100 %.

The relevance of the questionnaire is demonstrated not only by the participants from numerous countries, but also by the age of the test subjects, which varies from 17 to 83. There are many participants between 20 and 30, but there is also active participation in the survey between 30 and 60. There are even some participants older than 70 and 80. One can thus speak of a complex topic that attracts people of all ages.

The self-assessed singing ability of the singers is well suited for further examination for several reasons. Professionals are represented with 35 %, advanced singers with slightly more than 32 % and amateurs with almost 18 %. As we will show in the following two subchapters, the needs and strategies of these groups in dealing with foreign-language music are different under certain conditions. Multiple entries for the profession are rare at around 5 % and are therefore not taken into account in the analysis.

We also expect different preferences in the musical specialization of the participants. So, it is obvious to assume that soloists, who are represented with 34.1 %, have other needs than choir singers, who, as can be seen in Figure 1, are very strongly represented with 69.6 %. Conductors and opera singers are also clearly represented with 22.1 % and 14.2 %, respectively. We interpret more than 100 conductors within a questionnaire as an indicator that this problem of singing in foreign languages is particularly important for leaders of singing groups.

Some of the participants identified with more than one of the groups, e. g. they reported to be both a soloist and a choir singer. We treated these simply as a part of both of these groups and not of a special group “soloist-choir-singer”. We assume that in a situation where a participant acts as a choir singer, it does not play an important role whether or not he also acts as a soloist at other times.

3.3 Strategies for Singing in Foreign Languages

When singers are confronted with pieces in foreign languages, they use a variety of possibilities to cope with this linguistic challenge. As shown in Figure 2, the strategy of

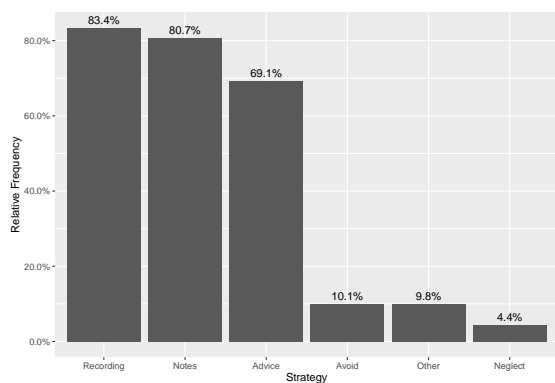


Figure 2. Relative frequency of the strategies used for singing in foreign languages. These strategies are Listening to recordings, taking notes in the sheets, or seeking advice from experts. The strategies to avoid singing in a foreign language, to neglect other strategies or the correct pronunciation are used much less frequently - Question 1.

listening to recordings is particularly popular (83.4 %) and not a significant problem in the digital age. Also, more than 80 % of all singing individuals take notes. According to the statements of many participants, writing serves as a memory aid and is therefore a central component of their work with music. In the case of borrowed musical sheets, however, it can be problematic or even forbidden to take notes. It is also not useful or necessary to take notes, when the test subjects are in an early singing stage, have an excellent auditory memory or elaborate language skills for the target languages in question.

Advice from a person who is familiar with the language to be sung is sought in about 69 % of cases. About 31 % of the test subjects do not seek additional opinions. On the one hand, this may be due to the lack of opportunities, especially in the field of laypersons, of whom only about 50 % seek advice. Or, on the other hand, to the unwillingness to deal with the target language more closely. Such a reluctance can point to a conscious neglect of the correct pronunciation. However, only 4.4 % of the test subjects state that correct pronunciation is sometimes not so important to them. This low relative frequency shows the intention of almost all musicians to achieve a pronunciation as “correct” as possible when singing. Moreover, avoiding to sing in a language one does not master is rare, with a prevalence of only about 10 % among the participants. This means that most singers are not afraid to be confronted with music in foreign languages.

Almost 10 % of the test subjects also use other strategies for singing in foreign languages. The additional remarks include the involvement of speakers of the mother tongue, the use of specialist literature and websites, translations and often handwritten transcription or transliteration.

The next question investigated, which strategies the test subjects use when taking notes in the sheets. This question specifically aims to show whether singers approach this issue systematically or not. As can be seen in Figure 3, only 22.5 % of the respondents stated that they follow a strategy that they had previously defined when taking notes in the

sheets; 11.4 % of all laypersons, 24.2 % of all advanced singers and 30.6 % of all professionals follow a strategy. A logistic regression gives significant results for the positive responses of the advanced ($z = 2.061$; $p < 0.05^*$) and for the positive responses of the professionals ($z = 2.710$; $p < 0.01^{**}$) compared to the general sample of positive responses to this response option. For the laypersons, no significant result is achieved. This is probably due to the already small group size of laypersons and additionally to the few positive answers, with only eight occurrences in total.

Also, whether the singers take notes above or below the text to be sung seems to be unsystematic with about 50 % each. There is also no decisive difference between laypersons, advanced singers and professionals. Normally, the original text is retained and only erased by 5 % of all test subjects. It is astonishing that only about 20 % sometimes do not know how to write down unknown sounds. This value indicates a high level of linguistic knowledge and a conscious examination of the musicians’ pronunciation strategies through singing. Since a large number of academics are also surveyed in this questionnaire, this value was certainly influenced by phonetic instruction at colleges and universities and by the intensive study of languages and speaking. However, it is likely that for certain sounds and words in some languages, awareness is only rudimentary, e. g. when one thinks of the complex realisation of tonemes in Norwegian or Mandarin in singing [10, pp. 294-295]. When interpreting this answer, it must also be taken into account that 20 % of the test subjects do not make any notes at all in the sheets, but are nevertheless taken into account in the false answers and thus also have an effect on the value of the true answers given in the graph. Thus, the error rate in this question is increased. However, this does not diminish the general tendency towards a lack of systematic notes in the notes. This impression is reinforced by further remarks of the respondents, who, for example, say that they write the improved pronunciation on the staff, that they adapt themselves specifically to the place on a sheet of music. They further stated that they use partly phonetic transcription (IPA), partly invented characters, or that they stick over the original, e. g. Japanese, text with having listened to a recording.

Approximately half of all test persons state that they have not yet been confronted with phonetic transcription. 100 people, or 22 % of participants, can remember a discussion about phonetic transcription, but not exactly in which context. 128 people, or 28 % of participants, can remember and often cite the encounter with foreign languages, the confrontation at school and university or pronunciation dictionaries as a source. The high number of those who apparently have not had any encounter with phonetic transcription or IPA can be interpreted in two ways. On the one hand, it is possible that some test persons have interpreted this question in the context of this questionnaire in such a way that they have never worked with phonetic transcription while singing or that they did not know how to use the term phonetic transcription or IPA, but know the theoretical concept. On the other hand, it is possible that people

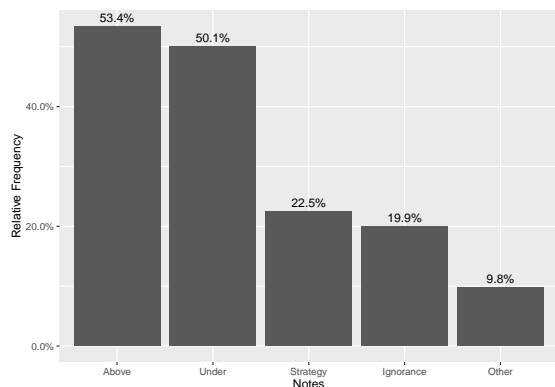


Figure 3. Answers to the question how the subjects proceed when taking notes. The answers are distributed more or less equally, whether they take notes above or below the notes. Followed by the frequency of those who make up a strategy before taking notes in the sheets and by the statements of those who sometimes do not know how to transmit a sound, other remarks and the statements of those who sometimes cross out the original text - Question 2.

with a lower educational level or older people could not actually gain any experience with this concept, as it is explicitly noted by some test persons.

3.4 Phonetic transcription in the sheets

In the third section of the questionnaire, the subjects were confronted with a concrete example of IPA transcription within musical scores (see Figure 4). The purpose of this figure was to assess whether they considered such a representation of a language useful. Exactly 60 % of the participants find a transcription in the sheets meaningful. Considering that, as described above, 50 % of the participants state that they have not worked with phonetic transcription yet, this value is high. However, a concrete example is given for this question, which might facilitate an answer. This assumption is confirmed by the fact that those who indicated in the previous question that they had not been confronted with phonetic transcription before are evenly distributed between the yes and no answers to the meaningfulness of IPA in the scores.

Slightly more than 31 % of the participants do not find such a transcription in the sheets useful, and only 3 % do not care. The rest are undecided or give their opinion on this question in the notes. Fears are, for example, that IPA is too difficult to interpret for the untrained or that the text becomes too confusing. In addition, the above-mentioned problem between phonological theory and phonetic reality in singing is addressed and therefore the approach with IPA is criticized. Some musicians also note that a discussion of the target language is necessary in order not to neglect semantic and other linguistic problems; moreover, it would tempt laziness if one no longer had to deal with the target languages. Positive feedback is also provided, such as the emphasis on IPA's easy readability, or its use in languages that use a foreign alphabet and are thus difficult for respondents to read, e. g. Russian for singers whose



Figure 4. Example of a phonetic transcription in a musical sheet. This was presented in a similar fashion to the participants as a part of Question 4. The piece “Die zwei blauen Augen” by Gustav Mahler can be found in the song cycle “Lieder eines fahrenden Gesellen” (around 1884–85).

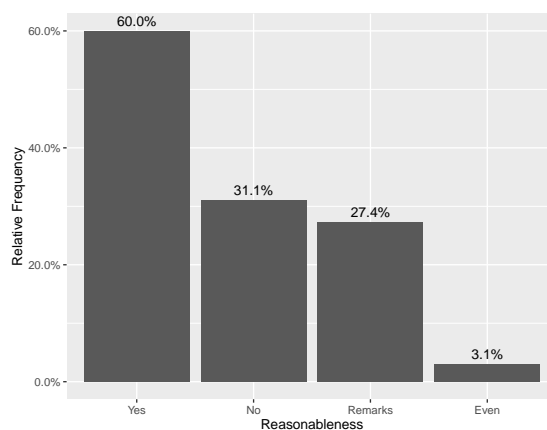


Figure 5. Answers to the question whether the experimental subjects think whether transcriptions in sheet music are useful or not - Question 4.

native language uses the Latin alphabet.

In the next question, the test subjects were asked to name the languages they wanted to see as transcriptions in the notes (see Figure 6). Russian is clearly in the first place with an absolute frequency of 113 wishes, which corresponds to over 35 % of all wishes. We suppose that in many cases, this might also mean Old Church Slavonic language variants or dialects, which often appear in choral literature and which the respondents may have identified as Russian; this is due to the Cyrillic alphabet, which is used for Old Church Slavonic and present-day Russian alike. A priming bias from the first question of the questionnaire is also likely, as it explicitly mentions a foreign language that uses a Cyrillic script. This example was chosen to make the relevance of singing in a difficult-to-read language clear to the singers from the outset. Note that this priming only potentially explains the high result for Russian but not for other often-named languages. Two other languages were named substantially more often than the rest and those are French (53 times) and Czech (37 times). There were also responses that specified language groups or rough geographical indications. “Chinese” was mentioned nine times and probably refers primarily to Man-

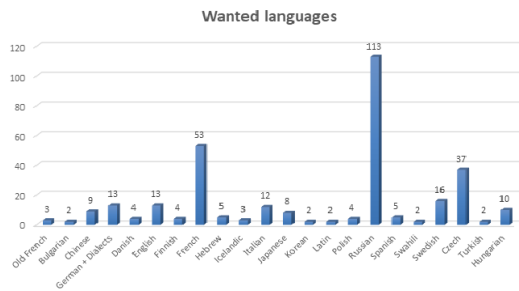


Figure 6. Languages the subjects stated they wanted as transcriptions in the scores. Question 6.

darin, the most widely spoken language in China, which is also the world's most common mother tongue with around 918 million speakers [11]. With eight mentions, Slavic languages lead the field of explicitly named groups. Note that responses clearly referring to a group of languages and responses that were only given once were not included in Figure 6. Of course, these answers mirrored the geographic and linguistic background of our participants. They are therefore not universally generalizable, but still represent an interesting sample from within the questionnaire's target audience.

4. CONCLUSION AND OUTLOOK

The aim of this paper was to show that the phonetic and phonological problem of singing affects many singers and associated persons. Furthermore, it was shown that this is a complex linguistic problem with many facets and possibilities for a solution.

As a promising solution, we have described the development of phonetic transcription for singing in the last 50 years and suggested as a logical consequence to use IPA directly in the musical sheets. In a questionnaire, we asked singers about their methods when dealing with the problem of singing in a language they do not know. These strategies, such as taking notes or consulting an expert of the target language, were evaluated and conclusions drawn for possible help. The test subjects were also specifically confronted with the suggestion of a transcription directly in the scores. The question as to whether they think such an approach makes sense was answered in the affirmative by 60 % and only a little over 30 % are against such a solution. It also turned out that the test subjects had clear preferences regarding the languages to be transcribed. Russian, French and Czech are particularly desired for transcription in the notes. Genres that should be used for a transcription in the sheets are choral music and operas, but also classical solo literature.

Now, we are working on an automated approach in the form of a computer program that facilitates transcription in the musical sheets. The goal of our circular transcription process is to become as automatic as possible. With the help of a decision tree and numerous improvement mechanisms, such as regular expressions, this program is specially programmed for sung text. The potential for improvement of the transcription process under programming

aspects and possible further offers, such as voice recordings, were further results of this questionnaire.

A frequent criticism of our proposed solution is that the central theme of the meaning of the text and the learning of the language is not taken into account. In order to counter this criticism, additional work should be done with narrow and wide translations and assistance provided for learning the target language, such as alphabets and audio examples. In this way, it is ensured that the emotional content of the target texts is not lost, but transported across borders.

Acknowledgments

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