



Review of Mr Mateusz Jekiel's PhD thesis "The influence of musical hearing on foreign language pronunciation in Polish advanced learners of English"

Mr Jekiel's cumulative PhD thesis entitled "The influence of musical hearing on foreign language pronunciation in Polish advanced learners of English" investigates the effect of musical hearing abilities and musical experience on the acquisition of vowels, rhythm and intonation by Polish second language (L2) learners of English. As one of the first large-scale longitudinal studies on the role musical factors might play in the acquisition of L2 phonology, it makes a novel contribution to our knowledge in the field.

The PhD project is divided into three sub-studies that were published in three separate research articles:

1. Jekiel, Mateusz & Kamil Malarski. 2021. "Musical hearing and musical experience in second language English vowel acquisition", *Journal of Speech, Language, and Hearing Research* 64, 5: 1666-1682.
2. Jekiel, Mateusz. 2022. "L2 rhythm production and musical rhythm perception in advanced learners of English", *Poznan Studies in Contemporary Linguistics* 58, 2: 315-340.
3. Jekiel, Mateusz & Kamil Malarski. 2023. "Musical hearing and the acquisition of foreign-language intonation", *Studies in Second Language Learning and Teaching* 13, 1: 151-178.

The PhD thesis consists of those three articles, an introduction that includes a brief summary of the research questions, methodology and findings of each of the three articles as well as a subsequent general discussion and conclusion.

In the introduction, Mr Jekiel first states the overall research aim of the PhD thesis, namely to explore the relationship between specific aspects of musical hearing and the acquisition of selected features of foreign language pronunciation in a formal learning environment. He then gives an overview of previous research on the

relationship between music and speech in general and discusses findings on the relationship between musical abilities, musical training and speech perception (but not speech production, although this is the focus of his PhD). He further makes the important distinction between – presumably inborn – musical hearing abilities such as pitch perception and rhythm perception abilities on the one hand and musical experience that has evolved through musical training, both theoretical and practical, on the other. Next, Mr Jekiel discusses previous studies on the effect of musical abilities and experience on the learning of an L2 phonology and convincingly points out their methodological shortcomings, which he aims to address with his own study. It is not quite clear, however, why the overall research question that is presented in this introduction only mentions the influence of musical hearing on L2 pronunciation, while in the actual three sub-studies that make up the PhD work further research questions (i.e., the learnability of L2 pronunciation and the influence of musical experience) are addressed. In general, it would also have been appropriate to discuss in the introduction in more detail why the PhD research cuts across the two modalities, comparing perceptual abilities with aspects of production in the introduction.

In the following summaries of the three published research articles, Mr Jekiel gives a concise overview of the respective states of the art and describes each sub-study's aim, methodology and findings, which he also briefly discusses. The first research article, for which Mr Jekiel's contribution is given as 60%, was published in an internationally highly acclaimed journal with a high impact factor. Its aim was to investigate whether musical perceptual abilities and experience influence the production of English monophthongs by 19-21-year-old Polish advanced learners of English. To this end, the musical hearing abilities of 50 advanced learners of English with Polish as L1 was assessed with the help of three musical hearing tests (pitch perception, melodic memory and rhythmic memory) before and after a two-semester training course in English pronunciation. The participants' musical experience was also measured. The students' production of the English monophthongs was recorded before and after the training course, and the formants were measured using automated vowel extraction. The study employs a novel approach in Second Language Acquisition research in comparing the students' vowel pronunciation to that of their teachers, a methodological choice whose advantages and disadvantages should have been discussed and evaluated in more detail. The findings show that students' rhythmic memory but none of the other tested aspects of musical ability or experience predicts the quality of their monophthong pronunciation before the pronunciation course, while only musical experience emerged as a significant predictor for their pronunciation quality after the training. Moreover, it emerged that individual vowels were affected differently. Overall, the results showed that students improved their vowel productions during the training course, with their pronunciation quality before the training predicting their success afterwards most clearly. The authors give an interesting interpretation that rhythmic memory might contribute to the perception of the English vowel length contrasts, which are novel for L1 Polish speakers, however, it does not become clear why this should not also predict vowel pronunciation after the training course. Similarly, the finding that musical experience only appears to play an explanatory role after the training course is not discussed sufficiently. In general, it might have been a good idea to also investigate individual learners instead of relying on group values only.

The second research article, of which Mr Jekiel is the sole author, was published in an internationally recognised journal. It reports on the second sub-study of his PhD project, in which he aims to investigate the relationship between musical aptitude and the acquisition of L2 rhythm by the same 50 students with Polish as L1 and English as L2. This was obtained through a reading passage and automatic annotation of vocalic and consonantal intervals as well as an automatic calculation of various speech rhythm metrics. Specifically, his objective was to contribute to our current knowledge by using a battery of rhythm metrics, which were convincingly evaluated in the theoretical part, for the assessment of L2 speech rhythm. The results show that some of the students' rhythm metrics had changed after the pronunciation training course, reflecting improvement in vowel reduction and vowel duration, while their consonantal variation remained unchanged. However, the findings also showed that musical aptitude or musical experience do not play a role in the acquisition of L2 rhythm. Especially for this finding, it would have been desirable to have a discussion of why a relationship between musical perceptual abilities and linguistic production abilities in the area of rhythm was expected in the first place. In the theoretical part, only the study by Llanes-Coromina et al. (2018) is mentioned that might suggest a relationship between the two, but this is not taken up again in the discussion part of the article. Equally, there should have been a discussion of why measurements of pitch perception and melody memory were included and what specific predictions were associated with those musical abilities in relation to the production of L2 speech rhythm.

The third research article, for which Mr Jekiel's contribution is given as 60%, was published in an internationally recognised journal and reports on the third sub-study that was concerned with the correlation between high musical hearing ability and the production of L2 intonation by the same group of speakers. In this sub-study, only the students' pitch perception and melody memory before and after the training course were related to their production of nuclear pitch contours that were elicited by reading out dialogues. The intonation was transcribed manually and binary scores (correct/incorrect) were given. The results show that, as a group, the students improved their scores significantly after the training course, with pitch contours on tags and wh-questions improving most. Furthermore, it was shown that only general L2 proficiency but not musical hearing abilities or experience predicted the accuracy of L2 intonation patterns before the training course. After the training, pitch perception significantly predicted the intonation scores as the only factor. This suggests that the pronunciation training course might have had an effect on the students' musical hearing abilities, and it is therefore a pity that the musical ability tests were not repeated in the post-training recording session.

The PhD thesis subsequently provides a general discussion of the results. It first summarises the findings on the improvement of L2 vowel production, speech rhythm and intonation and concludes that these aspects are learnable. This question was not actually raised in the introduction and does not constitute a major particular research gap in the first place given the previous related empirical evidence, but the study provides interesting detailed insights for this particular learner group. In the overall discussion of the influence of musical hearing abilities more space should have been dedicated to discussing why none of the abilities have an effect on any

of the production features both before and after the training and why in general very few effects were found.

In summary, the PhD thesis aimed to fill a genuine research gap, is based on a convincing study design and an impressively large dataset, uses highly appropriate and partly novel methodologies of data analysis and provides some new insights into our knowledge of the role of musical abilities and experience in L2 phonological acquisition. It clearly fulfils the requirements of a PhD and I therefore recommend the award of a PhD degree, subject to satisfactory performance at the viva.



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