LANGUAGE AND MUSIC: DESIGNING A COURSE AT AN ACADEMIC LEVEL

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Abstract
The parallels that are present between language and music, together with popular beliefs that musicality may be a factor enhancing language learning, especially with regard to pronunciation, prompted the idea of designing an academic course whose main aim was to demonstrate the relation between the two domains from the linguistic perspective. There were eighteen students participating in the course which was an elective for 1st year MA students of English at the University of Łódź. The course content included presentation of direct links between language and music, and of selected studies indicating the influence of music on developing various aspects of linguistic performance, e.g. second language learning (e.g. Pastuszek-Lipińska, 2008; Kolinsky et al., 2009), early reading abilities (Fonseca-Mora et al., 2018) or pitch processing (Besson et al., 2007). The practical part of the course involved testing the students' musical abilities with the use of various tools: tests available online and a sample of a music school entrance exam (based on Rybińska et al., 2016). The participants completed tasks related to their English speech performance, i.e. recording the passage *The North Wind and the Sun* and analysing their English speech production with the use of acoustic speech analysis software (Praat) in order to learn about the ways in which they could explore the possible links between their musicality and performance in L2 English. The majority of students claimed that they had not been aware of the degree of interplay between language and music, and had overestimated their musical abilities prior to taking the tests, but they saw the potential of music training not only in language learning, but other spheres of human activity.

Keywords: music, language, musicality testing, second language learning

1. Language and music

Language and music are believed to be linked in many ways and function similarly on different levels. The pitch of a music note may correspond with the pitch of the human voice engaged in a conversation. The rhythmic organisation of a piece of music may be found in declamation speech. Both seem to be "complex communication systems, in which basic components are combined into higher-order structures in accordance with rules" (Kraus & Slater 2015: 207) and "consist of sequential events that unfold in time" (Turker & Reiterer 2021: 6). Both

systems rely on the same dimensions of non-verbal performance, i.e. differences in pitch, tone, volume, prominence, stress, rhythm and pauses, and in expression of those in singing, for instance, they use "the same anatomic production system: the vocal tract apparatus plus the lungs and certain brain representations" (Besson & Schön 2001: 233). Another feature that is shared by language and music is that they are both used by senders (speakers or musicians) to convey a message and messages need to be decoded by means of the knowledge of the system, which in turn needs to be learnt through exposure, as "no language can be acquired without oral or written input" (Fonseca-Mora, 2000: 147). What is more, the processing of music and language relies upon working memory (Carpentier et al. 2016) and phonemes in language, just as intervals in music, are perceived categorically (Govaart 2014). The two are „used for expressing emotions, intentions, thoughts and knowledge" (Turker & Reiterer 2021: 6) that are culture-bound (Fonseca-Mora et al., 2011). Moreover, humans possess the ability to create an unlimited number of new sequences with the use of words or musical contours.

Apart from some obvious relations between language and music, there are also differences in the functioning of the two. Language with all its lexical, grammar and prosodic nuances is much more precise than music which relies mainly on expressing emotions: "Musical rules don't provide meaning whereas grammar provides meaning to language" (Fonseca-Mora et al. 2011: 102). While language tends to refer to the real world, existing objects and relations, music is not able to perform this manipulative function and is less demanding cognitively. There is also a substantial disproportion in the use of pitch ranges and variabilities between musical melody and language, where the range of pitch variability is much more limited (Chow & Brown 2018). With regard to rhythm, there are normally a regular beat in music and less regular and more free-flowing temporal patterns in natural speech (Patel 2010). The numbers and variety of musical tones in tone inventories of the majority of cultures (especially the western ones) are similar, as opposed to phoneme inventories of different languages (Fonseca-Mora et al. 2011).

Despite certain inaccuracies in direct relations between language and music, an attempt can be made to combine the two systems in representing speech with musical notation, both in terms of rhythmic patterns and pitch differences, although losing some of the categorical precision that is required for music notes. Rhythmically, it is possible to set the tempo of speech and meter in such a way that it can be changed throughout the passage as is common practice in many, especially contemporary, works of music. Tonal relations in speech can also be transcribed with the use of musical notation and since they need to be placed in time, rhythmic notation needs to be implemented at the same time and in the case of Fig.2 it is just an approximation of the real timing sequences present in spontaneous speech.

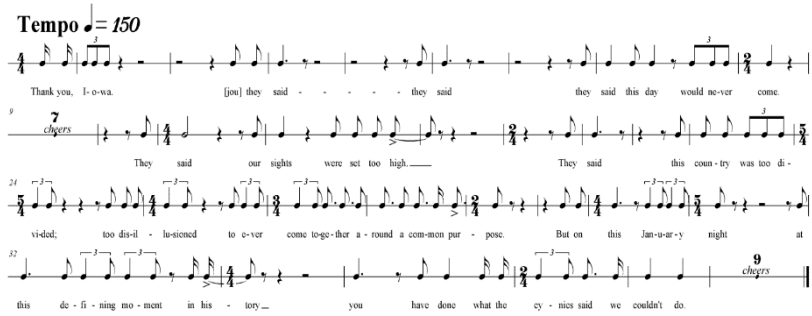

Figure 1: The first forty-seven seconds of Barack Obama's Iowa victory speech as in Ladefoged & Johnson (2010, p. 117)

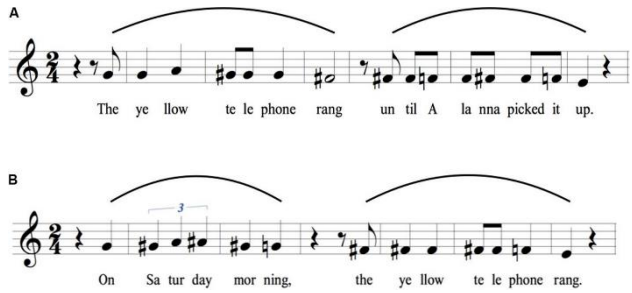

Figure 2: Melodic contours of two sentences consisting of two intonational phrases (Chow & Brown, 2018)

2. Musicality and language learning abilities

The term *musicality* is often used interchangeably with *musical talent*, *musical aptitude*, *musical skills*, *musical abilities*, *musical intelligence or musical giftedness*. All of these labels, however, can carry different meanings, depending on the theoretical and empirical perspective of a given author. *Musicality* is most often referred to as "a sensitivity to, a knowledge of, or a talent for music" (Nardo & Reiterer 2009: 213) or the ability to enjoy music aesthetically (Révész 1953 in Nardo & Reiterer 2009). *Musical intelligence* is a term oriented more on the cognitive content rather than associations with talent or abilities (Reimer 2003), which can find their realisation in many areas, e.g. composing, improvising, listening, performing on instruments or singing. *Musical aptitude*, on the other hand, has been defined as ”a measure of one’s potential or capacity to learn music” (Gordon, 2006: 228). *Musical talent* has been suggested to refer to "an innate tendency to understand/appreciate, perform or create music outstandingly" (Nardo & Reiterer 2009: 214). With all the definitions in mind, it should be noted that

musicality is a skill or set of skills that we can have to different degrees (Govaart, 2014).

There are numerous studies showing that high musical abilities can be strongly related with language learning abilities, suggesting that musicality can be assumed to be "part of the cognitive starter kit for auditory processing and thus intricately tied to an innate language aptitude profile" (Turker & Reiterer 2021: 8). Since musicality in these studies is usually understood as the abilities associated with music perception and performance, with pitch and rhythm as the two elements under investigation, it has been proposed that it might not be general musicality, but certain specific musical skills that could be advantageous in second language learning. For example, Bowles et al. (2016) reported that the ability of an individual to control pitch predicted second language aptitude in the case of a tone language better than general musicality. In other studies, pitch perception has been related to speech perception, showing that professional musicians outperform non-professional ones in detecting pitch differences in music and language (e.g. Besson et al. 2007; Burnham et al. 2015). Melodic abilities and musical training in general can result in improved discrimination of lexical tones (Delogu et al. 2006) and predict second language reading fluency skills (Foncubierta et al. 2020). Specific musical abilities were positively correlated with second language pronunciation (Dolman & Spring 2014). In a study on speech imitation, musicality and singing abilities were identified as the strongest indicators of good pronunciation in foreign languages (Christiner & Reiterer 2013). Reiterer (2019) and Coumel et al. (2019) found that it was not only speech imitation, but also accent faking, vocabulary and grammar aptitude and reading abilities that correlated highly with musical skills. Rhythm perception was also found to be a skill related to pronunciation talent in the second language and also grammatical sensitivity (Nardo & Reiterer 2009). Kolinsky et al. (2009) found that musical training positively influenced the processing of lexical stress, suggesting that there may be a transfer of rhythmic skills to speech perception. It seems evident that musical training can strengthen the existing musicality and exert a strong positive influence on second language learning. There are many studies confirming that subjects with both higher musicality and more intensive musical training performed better with regard to pronunciation in the second language (e.g. Milovanov et al. 2008, 2010; Pastuszek-Lipińska 2008, Kaszycka 2021). Learning a foreign language through music is also an area of scientific investigation, e.g. Ludke et al. (2014) found that participants who applied a listen-and-sing strategy in learning phrases in an unfamiliar language (Hungarian) obtained better results in memorising vocabulary. All of the above investigations seem to suggest that "the impact of musical training is not a myth, but has a scientific basis" (Pastuszek-Lipińska 2008: 5126).

All in all, it appears that rhythm and melody perception, are positively linked to speech production and/or comprehension. "This is most likely caused by the large neural overlap between language and music, specifically the potential of

music (through musical training or already present high musicality) to enhance language-relevant skills (e.g. auditory discrimination, attention, memory)" (Turker & Reiterer 2021).

Apart from advantages related to various aspects of language learning, musical training is reported to have other benefits. Professional musicians have better developed brain structures in certain parts of the brain (Govaart 2014). Musical training has an impact on auditory working-memory capacity (Kraus et al. 2012; Christinen & Reiterer 2013), cognitive function and healthy aging, as playing a musical instrument lowers the risk of developing dementia (Balbag & Pedersen, 2014). There is evidence that even a short-term period of music practice can enhance verbal intelligence and executive function (Moreno et al., 2011), and boost self-esteem (Costa-Giomi 2004). Not only training, but listening to music may be beneficial in some aspects of our life. Background music was proved to improve efficiency, motivation, staying on-task (White 2007) and lessen student anxiety (Dolean 2015).

3. The course Language and Music

3.1. Aims of the course

The main aim of the course was to demonstrate the relation between language and music from the linguistic perspective. It attempted to show how students can be involved in the exploration of the links between their language performance and musical skills. Its secondary aim was to raise awareness of the benefits of musical training and musical approach in various spheres of life. In more detail, the course offered the students the opportunity:

- to test their musical abilities
- to analyse their English speech production (rhythm, word stress and intonation)
- to learn about the ways in which they could explore the possible links between their musicality and performance in L2 English

Finally, the course aimed at exploring students' views on the course content and personal experience related to the link between language and music.

3.2. Course content

The course included a variety of materials and activities employing the terminology necessary for the presentation of the interplay between language and music and the general directions in the current research in the field, such as teacher presentations, assigned presentations, musicality tests, acoustic speech analyses, watching talks and lectures, accompanied by in-class discussions, and finally, self-reports. A week-by-week general outline of the course is presented below:

Week 1	Introduction & musicality questionnaire
Week 2	Language and music - general links (literature overview)
Week 3	*Music as a language* - TED talk (discussion) (https://www.youtube.com/watch?v=2zvjW9arAZ0&list=LLDq0Z vabw6kZCWNx5b2JZOw&index=181)
Week 4	Language and music - musicality and language learning (presentations)
Week 5	Musicality and how to test it (literature overview)
Week 6	Music school entrance exam - individual meetings
Week 7	Testing musicality - in-class online testing
Week 8	Music in teaching English (presentations)
Week 9	Word stress and rhythm (literature overview and presentations)
Week 10	Intonation in language and music (activities on tones in English + presentations)
Week 11	Praat workshop
Week 12	Praat workshop
Week 13	Leonard Bernstein lecture: *The Unanswered Question: Musical Syntax https://www.youtube.com/watch?v=r_fxB6yrDVo Musical Semantics https://www.youtube.com/watch?v=8fHi36dvTdE* (discussion)
Week 14	Self-reports

3.3. Participants

The participants who attended the elective course Language and Music were 18 first year MA level students of English Philology at the University of Łódź. There were fourteen females and four males. Not all of them completed their BA studies at the English Institute, therefore they demonstrated considerable differences in the background knowledge of English phonetics and phonology that students of English have the opportunity to familiarize themselves with during the first two years of their studies.

3.4. Musicality questionnaire

At the outset of the course, the students were asked to answer a number of questions related to their music experience and self-evaluated musicality in the form of a short questionnaire (adapted from Gralińska-Brawata & Rybińska 2017). Those students who stated that they had some experience in music were guided to answer some more detailed questions about the type of music experience, number of years of music training, the age of onset, the instrument they played and whether they still played/sang regularly at the time of attending the course.

Since the course was an elective one, it was supposed that it would attract students with a genuine interest in music and/or those with some experience in playing musical instruments or singing. It turned out that 10 students out of 18 had some experience in music: 4 of them attended music schools, 6 took private lessons, 3 played in bands and 3 sang in a choir. One of the students (Student 10) undertook all of these four musical activities in her life.

The number of years of music training ranged from 1 to 12 (M: 5.4, S.D.: 3.7). The age of onset of music training varied between 7 and 15 (M: 10.75, S.D.: 3.2). 6 students had experience in playing the piano, 4 learnt to play the guitar, 1 played the saxophone and clarinet, 4 sang in a choir or a band and one rapped in a band. Only 2 students stated that they trained music regularly at the time of completing the questionnaire; Student 6 played the piano 3 hours per week and Student 9 rapped in a band on a regular basis.

Table 1: Musicality questionnaire - experience in music

	Type of experience	*Nr of years*	*Age of onset*	*Instrument*	*Playing/singing regularly*
1	music school	12	7	piano	no
2	music school/ private lessons/choir	2	7	piano singing	no
3	playing in bands	1	13	singing	no
4	private lessons	7	14	guitar piano	no
5	music school/choir	8	9	guitar piano singing	no
6	private lessons	8	7	piano	yes (3 hours per week)
7	private lessons	4	15	guitar piano	no
8	private lessons	1	14	guitar	no
9	playing in bands[1]			rapping	yes (it depends)

[1] Student 9 did not state the number of years of music experience and the age of onset in the questionnaire

10	music school/private lessons/ playing in bands/choir	6/1/ 10/5	9/15/ 10/9	saxophone clarinet singing	no

The second part of the questionnaire contained questions concerning self-assessed musicality:

1. Do you think you have a good ear for music?
2. Can you play along in time with music?
3. Can you sing along in time with music?
4. Do you like listening to music?
5. Would you like to learn to play an instrument/sing?

14 students claimed they had a good ear for music. Interestingly, Student 7 who had a four-year experience in playing the guitar and the piano stated that she did not have a good ear for music. 9 participants noted that they can play along in time with music and 13 can sing along in time with music. All of them liked listening to music and expressed a willingness to learn to play a musical instrument or sing.

3.5. Musicality tests

There are studies suggesting that there may be a discrepancy between self-reported musicality and musicality tests (e.g. Govaart 2014; Gralińska-Brawata & Rybińska 2017). This may be the result of inadequate self-assessment of one's abilities or inappropriate design of the more objective testing tools. In order to verify the musicality of the students taking part in the course and offer them informative feedback on their performance, one of the in-class activities was participation in different types of tests verifying their musical abilities.

The first test was a shortened version of a typical entrance exam that Polish children go through in public primary music schools. It was conducted during individual online sessions (as the whole course was organised under pandemic conditions) with a piano as the instrument used for several tasks. The test consisted of two parts: perception and production. The perception part included four tasks. The first task consisted in identifying the number of sounds played on the piano. Individual students were presented with three stimuli: one sound and two chords based on two and three sounds, in a random order. In the second task the students were asked to say whether the melody in the form of a scale or arpeggio played on the piano was going up or down. There were two instances of the melody going up and two instances of the melody going down.

The third task intended to check whether the students can differentiate between major and minor chords. They were presented with four chords, which they could name using the major/minor or happy/sad labels. The final perception task was to identify the highest and lowest sound in a sequence of three sounds played at different intervals within the range of two octaves.

The production part of the test focused on two main musical elements, namely pitch control and sense of rhythm. The first task consisted in repeating single tones and sequences of two tones and three tones within the distance ranging from major second to perfect fourth after the piano that were played within a comfortable pitch range for each of the participants. The second task was the imitation of four short rhythmic patterns in a four-fourths measure (4/4) presented with a prior count-in, i.e. setting the tempo by counting the beats in a measure.

Each of the tasks was assigned a number of points and the maximum score was 20.

- perception
  - how many sounds — 3 points
  - melody going up / down — 2 points
  - major / minor chords — 2 points
  - the highest/lowest sound — 3 points
- production
  - repeating tones — 5 points
  - repeating rhythmic sequences — 5 points

maximum score: 20

Apart from this quasi music school entrance exam, the students took seven online tests available for free and were asked to report on them during one of the meetings. The tests that were offered to them are:

Distorted tunes test https://www.nidcd.nih.gov/tunestest/take-distorted-tunes-test

Adaptive pitch test http://jakemandell.com/adaptivepitch

Mandell's Tone deaf http://jakemandell.com/tonedeaf

Rhythm deaf http://jakemandell.com/rhythmdeaf/

Tone deaf test http://tonedeaftest.com/

Advanced Measures of Music Audiation(AMMA) https://giamusicassessment.com/

Musical IQ (The Music Lab) https://www.themusiclab.org/quizzes/miq

All of the above tests are perception tests aiming mostly at assessing pitch and rhythm deviations. *Distorted tunes test* checks whether the participant can identify incorrect tunes (i.e. tunes with some wrong notes). After listening to a number of

well-known tunes, one needs to click 'Yes' or 'No' in response to the question "Was the tune played correctly?" *Adaptive pitch test* is a tool enabling accurate measurement of pitch perception abilities. It presents the participant with a set of two tones asking whether the second tone is higher or lower than the first one. *Mandell's Tone Deaf test* invites the participant to decide whether two presented musical phrases are the same or different. *Mandell's Rhythm Deaf test* is organised in a similar way, but with the rhythmic phrases rather than the musical ones that need to be compared and assessed as the same or different. *Tone Deaf Test* consists of three stages. At Stage A, the participants need to verify whether the two tones are the same or different. At Stage B the listener is asked to decide whether a note that is played is sweeping up or down. Stage C presents the participant with two notes and a question whether the second note is higher or lower. The test also asks whether the participant plays an instrument, though the answer is not taken into account in the interpretation of the results. *The Advanced Measures of Music Audiation (AMMA)* assessment is a slightly more complex same/different verification, as the participant needs to specify not only whether a given music statement is the same or different from the previous one, but also, if different, how it differs, namely whether the difference lies in a tonal change or rhythm change. *The Music IQ* test starts with some introductory questions concerning emotions, preferences, engagement and beliefs about music. The test has got three parts and checks three different abilities: beat perception, tuning perception and melody discrimination. The first part is based on pairs of music stimuli accompanied with a beep track and the participant's task is to decide which music extract is played with a beep that is on the beat. In the second part it is not beat but the wrong tune that needs to be identified out of three melodies that are presented in different keys. The third part of the test consists in spotting the extract of music with the singer singing out of tune.

All of the above tests provide the participant with immediate feedback and a score. They are easily accessed and free of charge. The time needed for the completion of the tests ranges from approximately 10 minutes for *Distorted Tunes Test* to 25 minutes for *Musical IQ test*.

3.5.1. Results and students' comments

The results of the first test (a shortened version of a music school entrance exam) are presented in the table below. The scores range from 8 to 20 with the mean score of 15.2 (SD= 3.4) for the whole group, indicating considerable variability between the students' achievements. The group of students claiming music experience obtained a better score (M: 17.3) than the one without any musical training (M: 12.6). Students 1 and 10 got the maximum score and these are the two with the greatest music experience. The tasks that they were asked to perform seemed very easy to them as, apparently, their skills substantially exceeded the level of difficulty of the test. Student 11 who scored the lowest (8) admitted in the questionnaire that she did not have a good ear for music and could not play along

in time with music. Two other students claiming that were not musical scored low as well (Student 12: 12, Students 17: 10). Interestingly, Student 7 who stated she did not have a good ear for music even though she had a four-year music training scored relatively high (17), while Student 9 who assessed himself as musical and had some music experience (rapping in a band) scored lower (13).

Table 2: Musicality test results. Students 1-10 with music experience, students 11-18 with no music experience.

nr	score	nr	score
1	20	10	20
2	18	11	8
3	15	12	12
4	18	13	14
5	19	14	16
6	18	15	16
7	17	16	13
8	15	17	10
9	13	18	12
		M: 15.2 *SD*: 3.4	

When it comes to the online tests, the students reported various scores and shared different opinions on individual tests and musicality testing in general.

By taking up the tests that give immediate feedback, some students seem to have found confirmation of what they had previously assumed about their musical abilities.

> I always thought that I have a good ear and it was encouraging to find out that it is somewhat true with the help of multiple quizzes that we took over the course of the term. […] I seem to be able to identify the rhythm, sounds, and pitch correctly. (Student 16)

> The tests we were assigned to do during the classes confirmed that at least to some degree, I have musical abilities. I am glad that eventually, I got to know from a source other than myself that I do have these abilities. (Student 15)

Student 12, however, expressed surprise at how low he scored in the tests:

> Well, after taking multiple tests in musicality, it turned out (much to my surprise) that I wasn't very gifted at all! In fact, my results were quite average and, in some tests, even below average (especially when I needed to decide whether a song was sung in tune or not). Unfortunately, probably as many other people, I have overestimated my own musical abilities.

Student 17, on the contrary, was surprised to score above her expectations:

> Even though I still believe that I am really not talented in that aspect, and musicality is not going to ever be my strength, this course opened my eyes in some way. The tests you have asked us to take helped me understand that maybe I am not a lost cause. I expected the results to be much worse and I was pleasantly surprised. In all of the tests provided by you I scored above average or within the 'normal' range.

Student 6, on the other hand, questioned the reliability of the tests:

> [T]hese results are not very surprising for me because these tests were very easy and I do not know if they are reliable enough.

The difficulties that students reported most often were related to particular abilities that were examined as part of the tests or individual conditions connected with memorising and attention. Student 7 admitted that:

> Sometimes I have trouble telling which sound is higher or lower. I had the biggest problems with the tasks in which it was necessary to mark whether the sound is out of tune.

Student 10 wrote the following comment in her self-report:

> When it comes to the tests, I did well in all of them. I only had some difficulties remembering longer and more complex melodies or rhythms.

Student 3 reported that

> Some tests were too long and I observed my attention span decrease as the test progressed. Other tests were long enough and rather simple, some had unclear instructions or I misunderstood what was expected of me. (3)

Student 2 also admitted that she could have performed better if she had been more attentive.

Some students assessed individual tests pointing at their strengths and weaknesses. Student 6, for instance, judged the *Musical IQ test* as the best test,

> because it was not too easy, it was challenging but not too long and I suppose that the results are accurate because three different factors were tested. Also, it encourages to practice more and improve the score.

Student 1 assessed the same test as "the trickiest and most challenging [...], as it required a lot of concentration. Also, some melodies and rhythms were misleading, that is the difference between them was barely noticeable." Student 13, in turn, criticized the AMMA test for being too long and requiring good memory: "with the number of three long fragments played, hearing the third one, you could forget what the first sounded like."

Despite certain criticisms directed at some elements of the tests' design or dissatisfaction with the results, the general opinions on implementing musicality tests into the course syllabus were positive and expressing students' contentment at having had the opportunity to take the tests:

> All the tests were very interesting and I enjoyed them very much. (Student 1)
> I enjoyed the musicality tests a lot since they were fun to do and helped me get some musical concepts right. (Student 9)
> The most pleasant and engaging part of the seminar was taking part in the tests that were checking our musical abilities. (Student 6)

3.6. Presentations and online lectures

One of the assignments that students were asked to complete as part of the course was giving a presentation on a study or project that involved music in a certain specific way. The studies were described in published research articles available online and selected by the teacher. They were divided into five categories: 1. music in first language acquisition and second language learning, 2. music in teaching/a musical approach in the classroom, 3. rhythm in language, 4. intonation in music and language and 5. other.

Music in first language acquisition and second language learning:

- *Influence of music education on second language acquisition* (Pastuszek-Lipińska, 2008)
- *Musical Expertise and Second Language Learning* (Chobert & Besson, 2013)
- *First and foreign language early reading abilities: The influence of musical perception* (Fonseca-Mora et al., 2018)
- *Singing can facilitate foreign language learning* (Ludke et al., 2013)
- *Why Use Music in English Language Learning? A Survey of the Literature* (Engh, 2013)
- *Melodies that help: The relation between language aptitude and musical intelligence* (Fonseca-Mora et al., 2011)

Music in teaching / a musical approach in language classes:

- *Foreign language acquisition and melody singing* (Fonseca-Mora 2000)
- *Listen and Learn: an experiment on the effectiveness of songs in English L2 Pronunciation* (Tizian 2016)
- *European Music Portfolio: A Creative Way into Languages* & *Transversal learning through music in the teaching profession* (ed. Marjanen 2012)
- *The Impact of Music on Language & Early Literacy: A Research Summary In Support of Kindermusik's ABC Music & Me* (Mashizha n.d.)

Rhythm in music and language:

- *Rhythm metrics for 21 languages* (Marlano & Romano 2011)

Intonation in music and language:

- *Musical melody and speech intonation: singing a different tune?* (Zatorre & Baum 2012)
- *Song and speech: examining the link between singing talent and speech imitation ability* (Christiner & Reiterer, 2013)

Other related topics:

- *The enigma of dyslexic musicians* (Weiss at al. 2014)
- *Understanding the Benefits of Musical Training: Effects on Oscillatory Brain Activity* (Trainor et al. 2009)

The students could choose one of the research papers that they found interesting or useful. Longer papers were assigned to two students. All of them were asked to read the articles and report on their content to the rest of the group in the form of a presentation shared on the screen. Each of the presentations was followed by discussions of the studies' design and results.

The presentations enabled the course participants to get acquainted with studies confirming some correlations between music and certain aspects of learning a foreign language. In her self-report, Student 6 wrote:

> I have never thought about it [the connection between language and music] in such a specific way and I did not expect that the research made in this field might be so interesting. I find it particularly gripping in what ways music can be used in learning a foreign language because for me it is the most personal thing connected with language and music.

Student 16, apart from expressing her apparent interest in the research findings, also got inspired to employ some of the ideas in her teaching and replicate some of the studies on her own:

> It was very interesting to see the research on the influence of music in many forms on second language learning. In many cases the results seem to suggest that music can indeed have a positive impact on learning a second language. I was really interested in the research concerning pronunciation or intonation, as I think it is a good way to develop my own language skills. I was also interested to see the influence of music in the classroom, as I could use this knowledge to help my students learn English more efficiently and in an interesting way. I think it would be also possible to conduct a small study on my own, wherein I incorporate more music in my classes and see whether my students' results improve after a few weeks or months. Thanks to the extensive studies that we covered during this term, I think it would be possible for me to recreate some of those studies on a small scale.

Another element of the course that provoked discussions and encouraged viewing students' opinions were three online lectures. The first one was a TED talk by Victor Wooten entitled *Music as a language*. The other two were fragments of Harvard lectures delivered by Leonard Bernstein *The Unanswered Question: Musical Syntax and Musical Semantics*.

3.7. Acoustic analysis tasks

Having introduced and discussed the concepts of rhythm and intonation as they are employed in the domains of language and music, the teacher organized an acoustic analysis workshop with the use of Praat software. None of the students was familiar with this tool and the first step of the task was to demonstrate its general design, possibilities and functions. Then the participants were presented with the acoustic representation of an native English speaker's speech sample. The passage that served as the material for the analysis was Aesop's fable *The North Wind and the Sun* which has often been used for phonetic demonstrations. The activities that the students participated in were: an analysis of the correlates of stress in selected two- and three-syllable words (*disputing, stronger, traveller, succeeded*), observation of intonation contours of selected phrases and calculation of rhythm metrics out of phrases segmented into vocalic and consonantal intervals.

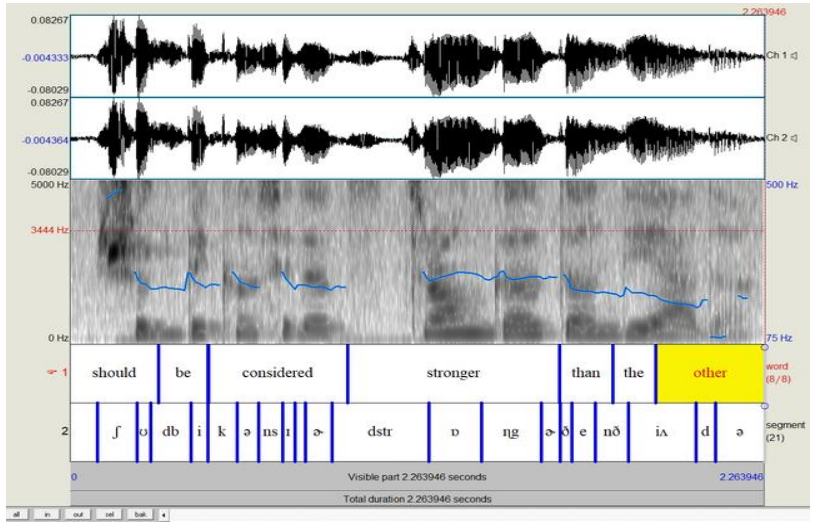

Figure 2: Segmentation of a phrase *should be considered stronger than the other* (Student 11)

The final part of the Praat task was the examination of students' own speech production. They were asked to record the passage *The North Wind and the Sun* and analyse the way they pronounced selected words (mentioned above) in terms of stress placement and identify the correlate that dominated in their realisation of stress. The second part of the task was the analysis of tones in selected utterances and comparison of tones produced by the students and the native speaker. Finally, the participants were required to segment manually selected phrases, measure the

durations of vocalic and consonantal intervals and calculate the most common rhythm metrics: %V, ΔV, ΔC. Later, they could compare their metrics scores with the mean scores of eleven native speakers of English (native speakers' results come from Gralińska-Brawata 2013).

After initial challenges of using Praat, the majority of students seemed to have enjoyed the task and shared their experience in segmenting and calculating rhythm metrics in comments:

> In regard to my second assignment I was surprised how interesting the speech analysis is in phonetics. Even though it is not connected with teaching English, which is my main area of interest, I found it very enjoyable and challenging. While working with Praat, I was amazed by the spectrograms which are visual representations of sound changing. It is really fascinating to analyse pitch, intensity, the quality of our voice and then to compare our pronunciation with that of native speakers'. (Student 8)

> I really enjoyed the assignment in PRAAT. I liked the Phonetics and descriptive grammar classes during my BA studies, and assigning the phonetic symbols while analysing speech was a really interesting and pleasant task. (Student 10)

> I was also intrigued by the Praat exercise, as some of the sounds took exactly the same time to utter, but then there were some that seemed too long, which might suggest that I may have problems with consistency. (Student 18)

> While working with Praat was initially challenging for me, it turned out to be an interesting way of looking at my English speech. It was also interesting to see how the properties of my speech compare to those of native speakers. (Student 15)
> The most engaging element of the classes - self-study of the rhythm of one's utterance in English. (Student 13)

> With regard to Praat, the tool seemed to be difficult at first. […] I had a problem with recognizing the sounds I had uttered, that is I had to listen carefully and a few times if I pronounced the word "then" as /ð**e**n/ or /ð**æ**n/, and also the word "other", that is /ˈʌ**ð**.ə/ or /ˈʌ**d**.ə/ (Student 1)

> I consider working with Praat quite beneficial, as it is always good to discover a useful application which might be helpful in the future. (Student 9)

3.8. Self-reports

The final assignment for students taking part in the course *Language and music* was writing a self-report. The issues that they were required to pay attention to were general comments on the course, reporting on the results of musicality tests, Praat and rhythm metrics assignment, experience with music and how they personally perceive the link between language and music. The most interesting and informative comments that they shared were divided into those expressing general opinions on the course, the relation between language and music, musicality tests and a Praat task. The observations pertaining to the last two issues

were already presented in sections 3.5.1. and 3.7. as an integral part of the described assignments.

3.8.1. General comments

There were numerous comments expressing a positive attitude to the content of the course, e.g.:

> This proseminar offered me a great opportunity to learn a lot about musical theory, which I hadn't gotten a chance to do during my previous education. (Student 11)

> I enjoyed the classes very much, as I have learnt a lot of new things related to music and language. (Student 1)

Some of the comments appeared to be more specific:

> I think I can certainly see the link between music and language when it comes to intonation, stress, and also learning techniques used in the classroom. I am also more inclined to use music more consciously, both in my learning and to help my students. (Student 16)

> I liked the exercises on tones which we did during our classes, although I did not expect that it is so difficult to differentiate between the particular tones. […] What is more, I learnt some new musical terms, such as beat, measure, note, major, minor, etc. In addition, I did not know that it is possible to transcribe speech with the use of notes, as in the case of President Obama's speech, and I found it very interesting. Also, I enjoyed the TED Talk which we watched during the classes. (Student 1)

3.8.2. The link between language and music

In the majority of comments related to the interplay between language and music, the students often shared their personal experience of learning English with the use of music:

> When I reflect upon my journey of learning English, I can clearly see that I (unconsciously) employed the "tactic/approach" of learning the language through listening to music. (Student 12)

> I have learned many new words, phrases, and idioms because they were the part of songs I frequently listen to. (Student 6)

> One time when I was in high school we had the task to learn a poem by heart and because it was a rather strange poem, I had a hard time remembering it. I composed a simple melody to the words that helped me remember them and, to be honest, I am really proud that I came up with this idea. (Student 6)

> I will never forget when I realized that while listening to music in a foreign language you can learn vocabulary. When I liked a certain song, I listened to it several times and I wrote down on a piece of paper everything I heard and compared with the original text. Thanks to that, I learned the pronunciation and checked the translation of words which were unknown to me. I was returning to the songs I had already known and consolidated vocabulary. (Student 14)

> I think having music lessons made me better at listening exercises in foreign languages. (Student 4)

> Since childhood, I have been listening to music and it helped me improve my language skills as well as my concentration. Music makes me think and I am able to accomplish more when I am listening to it. […] My vocabulary gets better as I learn new words from different languages, the words stay in my memory longer when I am singing. (Student 2)

There were also numerous comments on using music in teaching:

> Music is also an important part of teaching vocabulary because children tend to enjoy songs and by singing, they learn vocabulary faster. Older students can also benefit from songs, firstly by learning the correct pronunciation, and secondly, by familiarizing with the words or phrases in a specific context, which makes it easier to remember their meaning. (Student 10)

> Music, text and movement are a good combination. It is a fantastic way to learn a foreign language for children. […] Music develops concentration and sensitivity. (Student 14)
> I was also interested to see the influence of music in the classroom, as I could use this knowledge to help my students learn English more efficiently. I think it would be also possible to conduct a small study on my own, wherein I incorporate more music in my classes and see whether my students' results improve after a few weeks or months. (Student 16)

> Thank to the classes on *Language and Music* I realised how I can make use of songs to teach vocabulary. I have been preparing some additional song exercises for my students and I observed the increase in their comprehension of the presented vocabulary. What is more, they tend to remember new words better if they learn the song which includes them. Additionally they find it easier to learn the pronunciation while singing rather than repeating it by drills. (Student 8)

> I noticed that there is a difference between introducing vocabulary by reading it in a book and learning it from the song lyrics. (Student 7)

> Music is extremely helpful in classroom; research shows that it enhances learners' awareness of sounds, intonations, rhythms. It also helps students concentrate, stimulates creative processes and ensures a relaxed atmosphere. (Student 17)

The comments that were less personal referred to particular elements of the influence of music on language learning, e.g. benefits of musical training in acquiring proper word stress and intonation or learning vocabulary:

> Without music, without intonation, without various stress patterns, our speech would be bland and sometimes even incomprehensible. [...] As for the link between language and music, I feel that musical training helps the most in word stress perception and intonation. (Student 10)

> It is also easier to learn a language through music, for example to learn vocabulary through a song, as usually a song is easier to remember than just words without any context (...). (Student 4)

4. Pedagogical implications

One of the students' comments in the self-report task raised a very important issue regarding music education in public schools in Poland:

> I think it would be beneficial to put a greater emphasis on teaching music in public schools, and focusing on melody, rhythm, intonation, instead of learning by heart the history of music, remembering dates, events, names etc., which, I would say, is of secondary importance. (Student 10)

One can often hear that music education in public schools in Poland is not satisfactory and is far from being effective (Chwastek 2021). Despite the fact that the curriculum for teaching music in primary schools encourages active engagement in music, it seems to be focused too much on theory and reinforcing cultural and historical heritage rather than participating in music making activities, reproductive and creative tasks with room for experiments with instruments, voice and movement, and building confidence to perform. Singing, playing instruments and movement are particularly important in lower grades as practicing them may be beneficial to learners in many areas of their education, including literacy, mathematics, foreign language learning, but also releasing tension, enhancing memory and concentration. The adequate and professional music education requires a well-qualified and musical teacher. In Poland grades 1-3 can be taught by generalist teachers who may not have relevant qualifications and abilities. There are schools, especially private ones, with specialist music teachers teaching the youngest learners, but they seem to be rare. What is more, music classes focus largely on the music of the past rather than giving way to quality compositions of the present, often considering popular music or the music listened to by young people as having no or low value.

All in all, the benefits of music education are numerous. The recent criticism of the practices in the music classroom (e.g. Chwastek 2021) may start a debate on the current state of primary music education, which could result in improving its quality so that the potential triggered by active engagement in music is not wasted and learners can enjoy its multiple benefits.

5. Conclusions

The course *Language and Music* was designed in the main to raise the participants' awareness of the intricate interplay between language and music, especially with regard to language learning. The students were acquainted with some aspects of

music theory and music terminology that can serve as a starting point for deepening their knowledge and an individual conscious search for more sophisticated ways of engaging with music. The verification of participants' musicality through musicality tests was the element that confirmed the self-assessed musical abilities stated in the questionnaire, but in some cases it disclosed a lack of relationship between self-reported musicality and tests: overestimated musical abilities in a questionnaire were confronted with lower tests results of two male students and relatively high test scores were welcomed with surprise by some of the female students who evaluated their musicality as average or below average.

The students' comments on various elements of the course revealed their eagerness to explore the links between different aspects of language use and music. They also showed their engagement especially in the activities that involved discovering their individual abilities and speaking performance (i.e. musicality tests and speech analysis). The participants also seemed to have been interested in, and some even enthusiastic about, employing the computer software Praat in the analysis of their speech samples. What is more, they appeared to recognise music as a factor enhancing motivation, self-development and well-being, as some of them reported that listening to music or playing an instrument/singing helped them concentrate, relax and raised their spirit.

The course, thanks to its rather universal themes, does not need to be restricted to students of English, but can be offered to students of all fields of studies dealing with language and music in some way.

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