

# The Influence of Musically Gifted on the Development of Language Competences

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## Abstract

Cognitive processes related to children involved in music are directly related to other cognitive processes in the brain because music is known to directly or indirectly affect many mental processes, but we still don't have evidence of how and in which way this process takes place. Since the paper deals with influence of musically gifted students on the development of language competencies, in the theoretical elaboration of the paper we will try to analyze and compare musical intelligence in relation to linguistic intelligence. The empirical part of the paper will present the results of research on the process of mastering language competencies among students going to gymnasium who are musically gifted and attend music education in relation to other students.

**Keywords:** music, musical ear, language, competence, achievement

## Introduction

Research about connection between musical and linguistic abilities is not the latest revelation. Proof of how much the musical talent is important for the development of linguistic competences, or second language acquisition have instigated research in that particular field in the 30s of the 20th century. (i.e. Dexter & Omwake, 1934).

Starting with development of musical skills in comparison and co-dependence with linguistic competences, we quickly find ourselves analysing the differences and the similarities between musical and linguistic intelligence. It is important to stress causation and weaknesses of the educational system which has over course of time produced asymmetrical representation and neglect of the musical culture and art in the existing curricula which ultimately had a negative impact on the development of a young person. Cases in which musical abilities can have a positive impact to the learning abilities (whether of a native or second language) is connected to the possibility of the overlap of several types of intelligence (Gardner, 1993). Gardner states that interaction of various types of intelligence still is not known. The main aim

of the current research is the ability of interaction between different intelligence aspects and the possible overlap in various cognitive processes. Eventhough the earlier research was directed at components of the musical and linguistic abilities, the results can be applied in contemporary research although in some cases the results of the newer research often confirm the same findings as those done before.

In this paper only part of the whole research will be shown. The research covers wider population of elementary schools even including some High school (lyceum) students with the intention of comparing given results.

### **Musical and linguistical findings**

(Broca, 1861, Wernicke, 1874) hundred years ago discovered that certain language and speech difficulties are connected to certain brain defects which led them to conclusion that the left hemisphere is largely responsible for linguistic and analytical processes, while the right hemisphere is important for general facts processing. The old belief was that music belongs to functions of the right hemisphere, while the language was considered to be the function of the left hemisphere. Lately certain notions changed and we now see that the situation is much more complex. It is believed that both hemispheres have a lot of auxiliary functions which are part of the processing of both linguistic and musical area. (Maess et al, 2001)

Today it is believed that right hemisphere is important for linguistic prosody and intonation (Blonder et al, 1991; Weintraub et al, 1981) which can be important in the understanding of figures of speech like metaphor. Zatorre (2001) is of the opinion that it does not only apply to musical pitch but also to linguistic pitch – simplistically speaking, pitch, intonation and rhythm are universal categories regardless of the medium via which they're produced, which is confirmed by Patel and Peretz, (1997) who talk about the possibility of the left hemisphere processing information regarding both speech and musical pitch. Springer and Deutsch (1998, pg. 221) think that „although right hemisphere was connected to the pitch, especially where melodic line was important, the left hemisphere activated when it came to structures of the music intervals.“

Therefore, it can be observed that both right and left hemisphere play the part in pitch processing eventhough differences between musical and linguistic pitch signify that two forms of pitch can be processed independently inside the left hemisphere.

In the current literature the fact which claims that speech and music most likely share nervous resources in the field of intonation, rhythm and time processing is highly stressed. In the same way Douglas and Willatts (1994) results can be explained which show that intonation and rhythmic ability are areas of the music intelligence which most likely affects linguistic skills.

The ever growing research interest for speech and music overlap contributes to the solving of the problem of the structure of such overlap, and also points to the

difference between separate cases depending whether the individual has gone through musical training or not.

### Relationship between musical education and linguistic skills development

Some research have shown certain overlap in processing music and language in brain; for example Maess et al (2001) show results of the experiment which shows that Broca center is included in musical syntax processing. They suggest that this area is included in processing of many more information than it was believed. Eventhough they think that the left pars opercularis<sup>1</sup> is included in linguistic syntax processing, and that right pars opercularis is moreso included in processing od the music syntax, it is important to stress that both hemispheres activate considerably both in music and language. Messa et al research offers proof of firm connection between language and music processing and they conclude that that connection can at least partially explain the influence of musical education and verbal ability. (Douglas and Willatts, 1994)

Patel and Peretz (1997, pg. 191) stress the importance of understanding music as „integration of mutual cognitive processes“ moreso than as an „indivisible whole“. Different research deal with different aspects of musical structure and their relationship with linguistic structures (Patel and Peretz, 1997). characteristics that are studied include melody (contour, pitch, tonality), rhythm, tempo, dynamic, measure and song. The results suggest connection between the execution tasks of melody and linguistic intonation. The research that has been carried out by Fries and Swihart (1990) offers support to existance of mutual mechanism which governs metric organisation of music and language. Conversely, it seems that tonality rendition is only typical of music. Rhythm question in language becomes necessary because it delinates the difference between two different languages therefore placing language rhythm and other expressive methods into certain category is still highly debated.

Despite classification difficulties, it is clear that the rhythm is very important language aspect; i.e., numerous research deal with the manner in which mother tongue rhythm affects speech rendition. (i.e. Otake et al, 1993). Children can differentiate between language pairs based on rhythm all the while their mother tongue is present, but they fail to do so when both languages are unknown to them. (Nazzi et al., 2000)

Weinberger (1998) considers that „music benefits intellectual development which superceeds the music itself... learning and musical performance very likely offer direct neurological benefit. It seems that the connection between music an other intelligence types is worthy of further exploration, and it could be said that „Music“ and „Language“ aren't exactly completely independent, mental capabilites but that they

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<sup>1</sup> Pars opercularis is in the back part of the lower frontal brain wheel. Left pars opercularis is part of the Broca's center

are signs of complex sequence of processes in which some are shared, and some are not.

Just as Patel and Peretz (1997) point out, simultaneous language and music study offers the option for understanding and development of language competence just as hearing communication and knowledge in the bigger perspective than it is possible if we focus only on one area. This paper tries to observe the possibility whether high level of musical talent truly contributes to successful language acquisition, that is, in cases where there is no musical education (which could potentially aid it) if such correlation can be equally observed.

## **Empirical part**

### *The object and the research issue*

According to target goal, both issues and research problems have been defined and have been tested on 423 lyceum students grade 1 and 2 of the Split and Zadar area out of which 184 attended musical school or some other musical education whose musical preferences have been tested, and 239 students which never attended any sort of musical education or who never had their musical preferences tested.

Set goal, object and research issue was to test the correlation and connection of musical and linguistic competences in high school students which attend musical education and those that do not. Musical talent influence on the development of linguistic competences will be researched on achieved results of students in the field of native and second language acquisition.

### Hypothesis

Students who attend musical education have better results in studying native and second language.

Musical talent significantly affects development of all other linguistic abilities.

### Methods and research sample

During research, survey was used – surveys were created specifically for the purpose of this research. The research included 423 lyceum students of 1 and 2 classes in the area of Split and Zadar. Some of the methods used were: survey, description, comparison of the analysis of achieved results of the students in the field of Croatian and English language.

In the empirical part of this paper with the use of statistical methods, assumed hypotheses are tested.

Table 1. The influence of music education on the results achieved in English language in the 1th grade students.

Results of the English language pronunciation test	Attend music school (more than three years)	Do not attend music school
Above average	69,5 %	58,3 %
Average	23,8 %	29,7 %
Below average	8,7 %	12,0 %

Table 2. The influence of music education on results achieved in Croatian language in the 1th grade students

Results of the Croatian language pronunciation test	Attend music school (more than three years)	Do not attend music school
Above average	64,3 %	56,8%
Average	31,2 %	38,1%
Below average	4,5 %	3,1%

Table 3. The influence of music education on results achieved in English language in the 2th grade students.

Results of the English language pronunciation test	Attend music school (more than three years)	Do not attend music school
Above average	87,2 %	66,1 %
Average	12,2 %	29,8 %
Below average	0,6 %	4,1 %

Table 4. The influence of music education on results achieved in Croatian language in the 2th grade students.

Results of the Croatian language pronunciation test	Attend music school (more than three years)	Do not attend music school
Above average	79,2 %	67,8 %
Average	19,9 %	26,7%
Below average	0,9 %	4,5 %

## Discussion

In the first category of the tables we refer to those 184 students who attend musical school or have some other form of musical education, which includes getting tested to see basic musical preferences. In this category musical education entails playing an instrument, and not theoretical musical education. Second category refers to 239 students who do not attend any musical school nor who have been tested to see musical preference which does not necessarily exclude musical talent displayed by some students which fall into the group.

Let's give an example which can be seen in table 3. which shows that 87% of students, who attend second grade of high school and who have not played an instrument for three years or longer have, showed above average results for pronunciation test both in Croatian and English language, whereas only 12,2% achieved average result. Only 0,6%, almost not one student, have achieved very low results.

Therefore, throughout this research and displayed results in above showed tables, the evidence are apparent and unanimously show the correlation between musical capabilities and skills with the ability to acquire foreign language more successfully, unlike mother tongue. Given results show that the ability to differentiate pitch (Intonation) and rhythm in constant and independent relationship with acoustic interpretation of foreign and native language. It is also very useful to add the comparison with similar research which have been carried out in elementary schools (on younger students) where given results undoubtedly show the phenomenon (where students which have engaged themselves in musical education) of achieving better results in development of their linguistic competences in comparison to those which haven't spent as equal amount of time in musical education.

### **Hypothesis testing**

Research results have confirmed both initial hypotheses.

Students who attend musical education have better results in studying native and second language.

Musical talent significantly affects development of all other linguistic abilities.

### **Conclusion**

The ultimate goal is to seek answer to many open and unresolved questions regarding this area. Considering we are dealing with overlap of many different intelligence types, we simultaneously enter into interdisciplinary and multidisciplinary areas which demand more hollistic approach, integration as a foundational connection, team work, co-operative relations of scientists from several scientific fields in order to get closer to the answers that will be regarded as a higher level contribution.

If we do not use the advantages which we can find in natural phenomena, we drift away from the path which leads to success. Concretely speaking, in this case we focus on music which awakens motivational and emotional states which can be interlinked in the dimension of space as well as linguistic intelligence. This paper should encourage further research of the influence of the long-term musical education on other skills, i.e. language or other abilities.

Despite that, it is possible to use music potentiality just like Spychiger (1993) did so that, for instance, a reading lecture becomes more efficient by using the benefit provided by musical education. Taking into consideration presented proof, it is apparent that the connection of music anf other abilities and skills is worth further research, and the results so far have been nothing but exceptionally promising.

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