

So far, yet so close - The Comparative Analysis of Musical and Sports Talents

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Abstract

Positive psychology, which seeks to understand well-being and its most prominent research area, the study of the flow experience (Seligman, 2012; based on Goschi et al., 2022), has gained worldwide recognition. According to recent research (Nagy, 2019), well-being has significant genetic and personality determinants, just as it is in Gagné's dynamic talent model, which is the theoretical basis of our study. Music and sport, although two separate and distinct fields, can be characterised with several common attributes. We studied young people with musical and sporting talents along the catalysts and flow experience of the model, with the aim of comparing the two domains. Research usually focus on these areas separately, even without deep comparisons of the manifestation of pedagogical and psychological phenomena in these fields. To compare the two domains, we aimed to investigate students learning at secondary level talented in music and sport along with the catalysts and flow experience based on Gagné's model, which serves as the novelty since dormant talents in music and sport have not yet been studied in parallel in this age group in Hungary. Our qualitative preliminary research was based on semi-structured interviews with two individuals with outstanding talents in both music and sport and the professionals working with them (N=6). The results were analysed using Atlas.ti 7 text analysis software. Based on the correlations obtained, we designed our own online research questionnaire, where secondary school students (N=198) talented in music and sport learning in the North Great Plain region were involved. The results point the crucial role of the family as an external catalyst in the development of talent, strongly correlating with the previous research results. Regarding the flow experience as a motivational factor, we could see that flow experience is significantly present in both domains, with gender differences in favour of girls (59%) in the music domain. Concerning the interpersonal factors in the pilot study, a strong correlation could be seen between mental toughness and perseverance in the two domains. Overall, our results highlight the relevance of the family as an external catalyst in Gagné's model of talent with the potential of strengthening or weakening the motivation derived from interpersonal traits and the flow, which is also a common feature of both domains. The current research provides us with an appropriate basis to extend this research to Central Europe.

Keywords: Gagné's talent model, music, sports, flow, positive psychology, dormant talent.

Introduction

Our research was inspired by the realisation that music and sport have several parallels. Throughout history, we know of many people whose lives have been shaped by both. The case of Rudolf Kárpáti, six-time Olympic champion in sabre fencing, and Ilona Elek, two-time Olympic champion in foil fencing, who have shown their talents not only in sport but also in music, is proof of this. Even in the Greek ideal, the parallel between sport and the arts, which aimed to promote physical and mental health, was already present, as was the WHO definition of health: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1946).

Rhythm can be found everywhere in nature; life itself has a rhythm (Trenka, 2020), just like music and sports. Today, people strive to achieve a positive rhythm and happiness. The scientific formulation of this is well-being, the understanding of which has gained worldwide recognition in positive psychology (Seligman, 2012). The sources of physical and mental well-being are reflections of positive emotions, which is the basis of the theory of positive psychology. According to the theory of positive emotions, derived from Csíkszentmihályi, positive emotions such as joy, interest, and satisfaction broaden an individual's repertoire of thoughts and activities while at the same time increasing creativity and motivating the person to formulate new ideas. Recent research (Nagy, 2019) suggests that well-being has significant genetic and personality determinants, as does Gagné's (2008) dynamic talent model, which forms the theoretical basis of our study. We investigated young people talented in music and sport through the catalysts included in the model to compare the two domains. The nova of our study is the fact that in our country, dormant talents in music and sport have not yet been studied in this age group.

When we examined the literature on engagement in music and sport, we found considerable convergence in the factors involved in developing a particular talent (Földi

& Józsa, 2021). In the context of Hungarian research, Janurik (2007) investigated the role of flow experience concerning musical activities, which is considered to play a significant role in the engagement in the activity (Csíkszentmihályi, 2018). For this reason, we have systematised the mental, physical and domain-specific characteristics essential in defining musical or sporting talent to obtain a comprehensive picture of the characteristics of individuals who are outstanding performers and are presumably committed to the domain.

Firstly, this required an analysis of several models of talent, starting with Renzulli's three-ring general conception of giftedness (1978), in which the intersection of the three determinants constituted talent. Renzulli believed talent was the sum of creativity, task commitment and above average ability. Task commitment encompasses motivation and the type of motivation, as well as willpower, diligence and perseverance (Berki et al. 2020). Above average ability includes all the specific or general mental-physical abilities required to develop talent, which a talented individual must possess. Finally, creativity is defined as the ability to develop the abilities of the previous two areas through problem-solving and thinking outside the box (Renzulli, 1978). Renzulli's model is the basis for Czeizel's (2004) model of Hungarian medical-genetic talent. Based on the three components of Renzulli (1978), this model complements the model of Mönks and Knoers (1997), which already includes environmental influences related to the individual, such as family, school, peers and society. Czeizel adds a further factor, fate, to the models he has developed for determining talent. By this factor, he means factors that are independent of our will (accidents, misfortune) and, to some extent, dependent on us (lifestyle, health), which can influence the individual's situation either positively or negatively (Czeizel, 2004).

Searching for mechanisms that influence the manifestation of different skills in practice, we found Gagné's (2008) dynamically differentiating model. According to Gagné, the mere fact that someone has outstanding abilities is not enough for them to put them into

practice. A sufficient amount and quality of invested work and development is required to achieve in the field, the performance of which is influenced by inter- and intrapersonal catalysts. Thus, the focus has been on the environmental and intrapersonal factors that influence individuals in developing their competencies. The set of chance and random factors in the Gagné model was compared with the Czeizel fate factor. At this level, the role of the music teacher/coach/physical education teacher is valorised, as one has a great responsibility to turn a talent that is waiting to be discovered, i.e., dormant talent, into a talent.

Investigation of musical talents

Today's most common and widespread view is that "you have to be born to play music". Research by Gordon (1990) shows that heredity plays a major role in developing musical talent. In this connection, Zoltán Kodály, the Kossuth Prize-winning composer, said: 'Let music belong to everyone', and when asked when to start a child's musical education, he replied: 'Nine months before birth'. (Kodály, 1964, 246). Thus, Kodály not only relies on heredity to develop musical talent, he also believes that parents' attitude towards music greatly influences who becomes musically competent. The socio-economic status of the family and its socio-cultural background are related to the chances of the growing child influencing the development of musical talent, and their influence is clearly manifested in musical taste.

Motivation plays a key role in the development of talent (Balogh, 2012). We must distinguish between the motivational background of singing and music lessons in schools and individual instrumental learning, as the former is compulsory for all in a group session. At the same time, the latter is a voluntary individual lesson, which presupposes the individual's environmental stimulation and/or increased motivation. Several studies show that the involvement of parents is essential in the early stages of instrumental learning (Turmezeyné & Balogh, 2009). Looking at the role of the teacher, a friendly, fun atmosphere is crucial for beginners (Janurik & Józsa, 2018), where arousing interest is more important than

professional rigour. From adolescence onwards, consistent, punctual work and high professional expectations dominate in terms of the relationship. In young adulthood, would-be artists may have been students of famous musicians who also became their role models.

Assessment of sports talents

Individuals who are talented in sports are mostly determined by professionals in relation to performance and results. Harsányi (cited by Orosz, 2019) considers sports talents, including athletics, to be those who have the genetically inherited abilities, i.e. physical, psychological, anthropometric, motor, and social abilities, at the right time, at the right level, and in the right development process. Thus, the individual is most likely to be able to perform at the highest level that he or she is capable of in the future. If we take a holistic approach to this kind of concept, we can say that sport and talent help an individual to fulfil his or her personality and help his or her life to become a more fulfilling, well-rounded whole. The study by Gabler and Ruoff (cited by Révész, 2008) considers gifted athletes to be those individuals who, at different stages of their lives, possess physical and mental attributes that are more likely to contribute to their high performance in later life. According to Frenkl (2003), human beings participate in sports as bio-psycho-social beings, and physical, mental and social factors therefore determine sports performance. Personal, interpersonal and transpersonal factors also play a decisive role in developing physical ability.

Comparing musical and sports talents

Sports and musical performances share many similarities (Trenka, 2020), such as the demands of prolonged training, endurance, perfectionism, high levels of self-regulation, strategic decision-making, emotional expressiveness and social skills. Music promotes many elements of sports performance, such as arousal regulation, synchronisation, and the acquisition of motor skills (Pates et al., 2003).

Musical and sports performances are often associated with emotional states such as flow

(Martin, 2008; Altenmüller & Ioannou, 2016). One common aspect of musical and sports performance is that both elicit a strong flow. Csíkszentmihályi (1990, 1993) found that artists and athletes are more likely to experience flow, especially during work. Csíkszentmihályi defined flow as "the holistic sensation that people feel when they act with total involvement" (Csíkszentmihályi, 1975, p. 36). In music and sports, one often observes total immersion in the activity, high intrinsic enjoyment and intrinsic motivation. This fact is supported by a study by Habe et al. (2019), which examined the gender prevalence of flow among already accomplished talents (athletes/musicians).

In the literature on the topic, which has mainly examined the two areas separately, some common points point out the crucial role of the family environment. Similarities were found between the practice of sport and music, such as a sense of rhythm, breathing technique, body awareness, prolonged practice, high levels of self-regulation, and emotional expression, and both induce a strong flow. Given the differences, musical training often starts earlier than sports training, requiring fine motor skills and takes place in an extremely competitive environment, often causing anxiety even for the highest performers (Biasutti & Concina, 2014).

Qualitative pilot study

Our pilot study was based on semi-structured interviews (N=6) with a promising young person who has excelled in both music and sport and a young person who is considered to have a dormant talent in the same fields, and the professionals working with them, who agreed to their names being published. These were carried out between November 2021 and May 2022. ATLAS.ti 7 content analysis software was used to process the interviews. Our qualitative research question was as follows: Among the catalysts identified in the Gagné model of talent (2008), which are the ones considered as determining factors in music and sport?

Our first two interviewees were chosen because they both excelled in music and sport, and the

fate factor of Czeizel or the chance factor of Gagné was decisive in their careers. Our first interviewee had an outstanding high jump performance as a youngster, but an injury interrupted her athletic career, and she achieved outstanding international results as a singer. Erika Miklósa, a Kossuth and Liszt Prize-winning opera singer, is a proven talent. Our second interviewee, who can be defined as a dormant talent, is Hunor Szabó, a former athlete of the national team who also sings in a choir, plays two instruments and is a highly talented student at a secondary school for the arts. Further interviews were conducted with Hunor's grandfather, Dénes Szabó, Kossuth and Liszt Prize-winning choirmaster, who is the father and leader of the Cantemus choir family, and his father, Soma Szabó, Liszt Prize-winning choirmaster, who is the leader of the Cantemus Boys Choir and leader of Mixed choir (Vegyeskar). Regarding sports talent, we involved two professionals, Imre Széles, Hunor's athletics coach, and László Vas, head athletics coach and college associate professor.

With the help of the ATLAS.ti program, we were able to determine the relationship and correlation between the interviews. To do this, we coded the interviews to examine the external determinants of talent and personal abilities and skills (fate/opportunity, family, school, friends, society, skills/abilities). In summary, regarding music, the most important environmental motivational factor is the family, especially the role of the mother, as the first years (including the nine months before birth) play a very important role in the child's relationship with music. These periods are considered the sensitive period for music. Next in order of importance is the role of educational institutions, such as kindergartens and schools, and within them, the attitudes and professional training of teachers, which can develop and strengthen musical receptivity, primarily through musical experiences. These are followed by the influence of society and peers, for which there are no generalised statements in this case but only in individual cases. The role of these factors in motivation is strongly demonstrated. The indispensable role played by developing intrinsic motivation and the ability

to set goals were also identified as a priority for this topic. On the contrary, compared with music interviews, the importance of peers in sports surpasses the role of the school and the people around it. Concerning the family, in this case, the innate abilities received more attention than the ability to develop them in early childhood. However, the indispensability of the work done, perseverance and diligence is unquestionable even here after the years have passed.

Therefore, one of the biggest results of the interview research is that the order of the factors regarding their importance differed. In case of music, the order was as follows: 1. family, 2. school, 3. peers and 4. society. On the contrary, the order is changed in case of sport since it is the following: 1. family, 2. peers, 3. school and 4. society. Beside these interpersonal factors, some additional intrapersonal factors were named by the interviews namely intrinsic motivation, setting goals and flow.

Of course, subjectivity cannot be completely ruled out, but the programme allowed us to compare how and to what extent the six factors appear in the six interviews, what the interviewees think and how they perceive them. The strongest relationships were shown for skill-family, family-school, and school-peers. In most cases, family was the most influential factor.

Aims and hypotheses of the study

In our study, we analysed young people talented in music and sport and looked for intersections and similarities between the two fields in the light of talent models, with a strong emphasis on external environmental factors and abilities. The nova of our study is that in our country, dormant talents in music and sport have not yet been studied in this age group. Based on this, our main research question is: of the catalysts identified in Gagné's model of talent (2008), which are the most influential in talent development?

Hypotheses

H1: We hypothesise that the educational attainment of parents of students who excel in music is higher than that of their sports peers.

H2: Students who study music are more likely to turn to parents in case of emotional insecurity than students who study sports at a higher level.

H3: Assume that concerning gender:

A: The prevalence of flow experience in music will be higher among girls.

B: In the field of sport, we find a higher prevalence for boys.

H4: We hypothesise that perseverance and mental toughness are important for talented students to perform in both sports and music.

Material and methods

Based on the findings from qualitative research, we developed our online research questionnaire, which was completed voluntarily by secondary school students (N=198) talented in music and sport learning in the North Great Plain region, with a boy-girl ratio of 93-104. Of those who completed the questionnaire, 104 were students learning in music secondary school, and 94 were certified athletes learning in sports schools. In addition to demographic questions (gender, age, place of residence, school), the questionnaire also examined parental and family attachment. This was done on a multiple-choice and Likert scale, with a mean value for each index, above which was considered "yes" and below "no". On this basis, cross-tabulation analyses were applied. The survey consisted of a block of questions about their activity-specific motivation, what they think the area enhances their skills and what useful skills they gain from it. General Flow Description (Magyaródi & Oláh, 2015). Based on the General Flow Index (Jackson & Roberts, 1992) and our qualitative interview analyses, we created a description of the flow experience, which the subject reads and rates on a five-point Likert-type scale (1: not at all - 5:

absolutely) how much the experience is typical for the student during the music or sports activity and how intense the experience is in general. Data were collected between January - February 2022. Two separate questionnaires were sent to the young people active in the two fields of study to achieve better traceability within the Google Forms service and to get a preliminary idea of the results obtained. The data obtained were analysed using SPSS 16.0. Various multi-sample parametric and non-parametric tests were performed with the program, producing tables and cross-tables ready for analysis, from which charts were constructed.

Results

Our first hypothesis was formulated in the light of the results evaluated with Atlas.ti 7. We were curious to see how the social background derived from family background would be related to the two domains. Using a cross-tabulation analysis, we examined the educational attainment of parents and obtained the following results of the comparison (Figures 1 and 2).

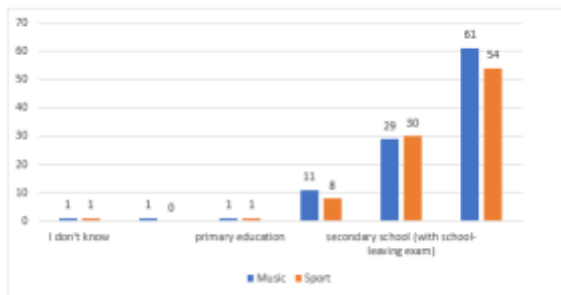


Figure 1. Comparison of mother's education and activity using the Chi-square test (N=198)

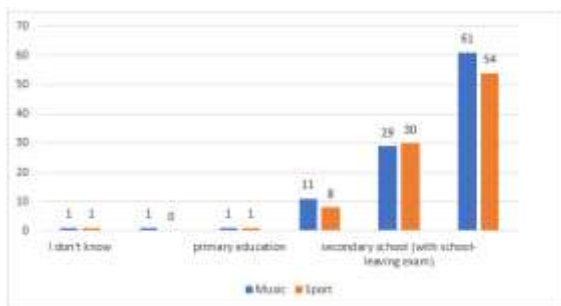


Figure 2. Comparison of father's education and activity using the Chi-square test (N=198)

The chi-square test was applied to test the hypothesis. No significant relationship was found between the two values as $p < 0.05$. No significant difference was found between the educational attainment of either mother or father among parents of both fields ($p = 0.347$ and $p = 0.801$). Based on these results, our first hypothesis was rejected.

In our second hypothesis, we tried to investigate the importance of family background from a different perspective. In the present case, we hypothesised that students involved in music would have a closer relationship with their parents than students involved in sports. Based on a cross-tabulation analysis, the graph (Figure 3) shows the proportion of sports and music students concerning the variables under study.

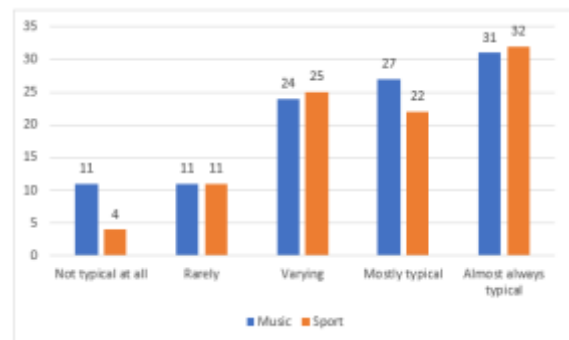


Figure 3. Turning to the parent and comparing the activity using the Chi-square test (N=198)

Using the Chi-square test, we found no difference between the two areas ($p = 0.326$). In this case, the significance level was also $p < 0.05$. Based on this result, our second hypothesis, that music students have a closer relationship with their parents than sports students, was also rejected. Overall, it can be stated that, for our study sample, the influential role of the family is similar for both groups.

In our third hypothesis, we analysed the flow experience as an interpersonal motivational factor in the light of gender and field of study. We based our hypothesis on the study by Habe et al. (2019). We hypothesised that in the field of music, girls will have a higher prevalence of flow experience, while in the field of sport, we find a higher proportionality among boys. Figure 4 shows the diagram constructed from

the cross-tabulation analysis in the dimensions of flow experience, activity performed and gender.

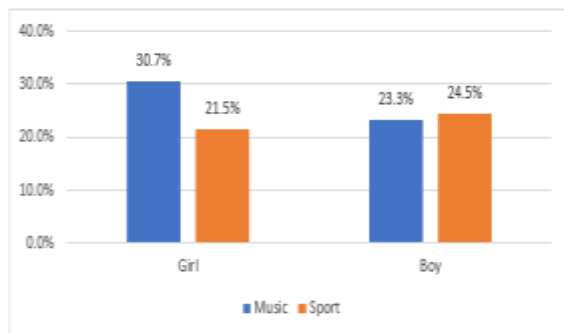


Figure 4. The distribution of the occurrence of flow experience by gender and area (%), N=198)

There was a significant difference for gender in music, which is shown on the left side of the graph, but no significant difference in sport ($p=0.314$). Concerning our third hypothesis, this means that A) is retained, as the prevalence of flow experience is higher for girls than boys in the music domain. Our results align with those of Habe et al. (2019). In sports, as no gender differences were found, we rejected part B of our hypothesis.

In our fourth hypothesis, we hypothesised that perseverance and mental toughness are important for gifted students to perform in both sports and music. After cross-tabulation analysis and application of the Chi-square test, we obtained the following results (Figures 5 and 6).

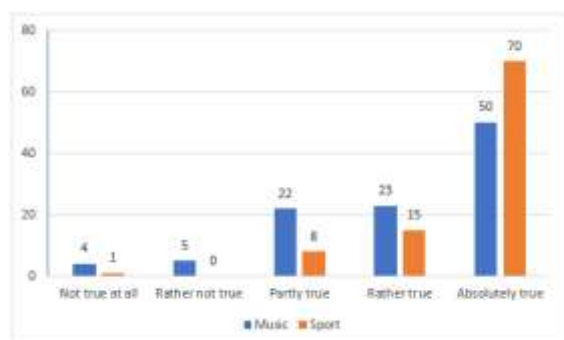


Figure 5. The need for mental strength and the comparison of the activity (N=198)

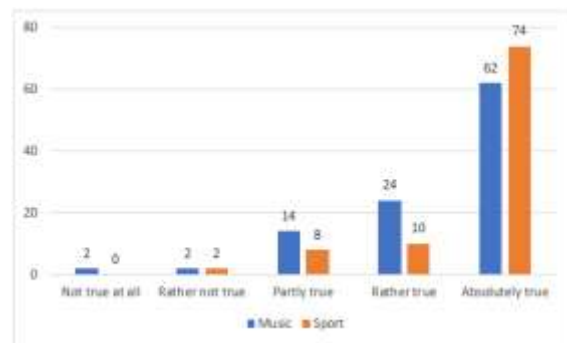


Figure 6. The need for persistence and the comparison of the activity (N=198)

The result of the Chi-square test comparing mental toughness and the activity performed is $p<0.001$. The result of the test comparing perseverance and the activity performed is $p=0.015$, which means that our hypothesis 4 is confirmed.

Conclusions and summary

For our study sample, we found agreement with previous research findings in several areas and differences in two areas. It is important to note that these studies are not comparative analyses. In the case of the first hypothesis, we found agreement with the research of Gyarmathy (2002), who argues that superior musical ability is not necessarily due to higher parental intelligence. However, we found a discrepancy with Szűcs' (2017) findings that parents of music students have higher educational attainment. We also found a similar discrepancy with the research of Oláh et al. (2018), where they argue that children from families with higher educational attainment are more overrepresented among sportsmen and women. Overall, studies in this area may show mixed results, and the relationship between parental education and student achievement can be influenced by many factors beyond just the chosen activity (music or sports). Different studies might find different patterns based on the sample size, geographical location, cultural differences, and other variables, e. g. socioeconomic status, cultural values, and individual preferences. At times, parents of students excelling in music may be perceived to have higher educational attainment due to the

perceived emphasis on academic and intellectual pursuits in music education. In some cases, parents may encourage their children to engage in both music and academics, resulting in a correlation between higher parental education and musical achievement. On the other hand, parents of students excelling in sports might have varying levels of educational attainment depending on the specific sport and the cultural context. In some sports, there might be a greater emphasis on physical training and athleticism rather than formal education, leading to a more diverse range of parental educational backgrounds (Moustakas, 2020).

Our second hypothesis is in line with the study by Gyömbér et al. (2016). If a parent is not involved in the child's athletic career, the child will turn to others for emotional support sooner in case of emotional insecurity. We must emphasise that research on how extracurricular activities like music and sports impact emotional well-being and parent-child relationships can be complex and context-dependent. Factors such as the individual's personality, family dynamics, social support networks, and cultural influences can all play a significant role in how students cope with emotional insecurity and seek support. Parents often serve as important sources of emotional support, guidance, and comfort for their children. When students are feeling uncertain, stressed, anxious, or insecure, they may seek solace and understanding from their parents due to the strong bond and familiarity of that relationship. It's important to note that the willingness of students to turn to their parents in times of emotional insecurity can be influenced by various factors, including the quality of the parent-child relationship, communication patterns within the family, the cultural context, and the individual personality traits of both the student and the parents (Brock & Kochanska, 2016).

Our third hypothesis is in line with the results of Habe et al. (2019), where they argued that women tend to experience positive emotional states more intensely and vividly than men. This could include positive emotions such as happiness, joy, and empathy, although we

should note that no consensus has been reached concerning the topic. Several findings suggest that emotional expressivity is more diverse among women than men, regarding both positive and negative emotions. These studies indicate that women have a greater degree of differentiation in their emotional responses (Gard & Kring, 2007). However, other research has found no distinguishable gender differences in subjective evaluations when participants were shown emotional stimuli such as pictures, faces or movies (Biele & Grabowska, 2006; Evers et al., 2014; Lobo, 2023). Nevertheless, our results highlight the gender differences in the experience of positive emotional states in the field of both sport and music.

In our last hypothesis, we hypothesised that perseverance and mental toughness are equally important for people in both domains. This is confirmed, for example, by the findings of Csíkszentmihályi (2018) and Habe et al. (2019). Both perseverance and mental toughness are domain-independent competencies that fundamentally determine the success of an activity, so although sport and music are very different domains, the high demand and presence of these competencies is a prerequisite for successful performance. In both sports and music, perseverance is crucial for achieving high levels of performance and skill mastery. Athletes often encounter obstacles such as injuries, losses, or plateaus in performance. Perseverance helps them maintain their training routines, stay motivated, and keep pushing themselves to improve. Musicians also face challenges like technical difficulties, creative blocks, or public performances. Perseverance enables them to practice consistently, work through challenging passages, and refine their skills over time. On the other hand, mental toughness helps athletes stay calm during high-stakes competitions, overcome nerves, and perform at their best even in challenging conditions. Musicians with mental toughness can manage stage fright, handle the pressure of live performances, and maintain concentration during intricate or demanding pieces. Therefore, both sports and music require individuals to develop these qualities to excel. However, the specific

challenges and contexts in each domain can shape how perseverance and mental toughness are developed and expressed.

We would like to emphasise that the research findings just mentioned were about established talent, yet our research was about dormant talent. Based on the results of our current research, extended with those of the interview investigation, we have modified the Gagné model on which our research is based on our research findings and would like to present it in our edit (Figure 7).

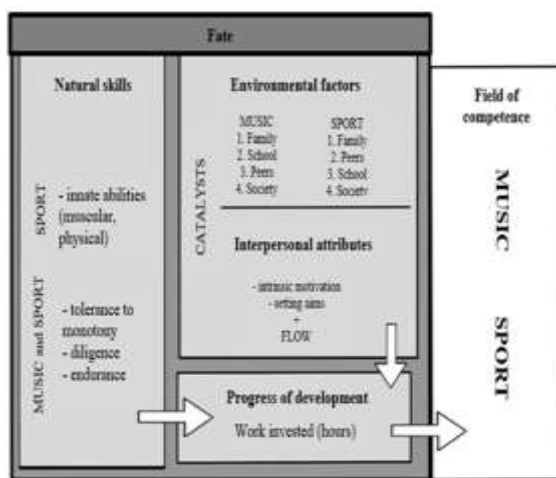


Figure 7. Gagné's model (2004) is a modified figure (own edition)

Our hypotheses have also shown that the role of the family is a strong determinant for both fields, and we have therefore ranked the influence of external environmental factors first. We would also like to emphasise the importance of invested work in developing a talented person, which strengthens the motivation for the activity and the pleasure experienced in the activity. In this way, we can relate to the positive psychology approach defined as a starting point. A positive aspect of our study is the use of various mixed methodologies, but the real nova of our research is that dormant talents in the field of music and sport have not yet been studied in this age group in our country. Our study also has some limitations. The main limitation concerns sampling. The sample might be biased because those with intrinsic motivation were more likely to participate in the study (Habe & Tement, 2016). The second limitation is that we

did not use a regular flow scale in our questionnaire; we only wanted to explore the existence of flow experience while performing the activity. This can be a very personal and subjective experience, which is very difficult to quantify. It would be useful to use an empirical sampling method. However, in our experience, collecting data from musicians and athletes of this age group is very difficult because of this generation's high degree of divided attention (Tari, 2015). While they want to achieve in music/sport, they also try to fulfil their school obligations and last but not least, they want to maintain their peer relationships. This suggests that they have a wide range of challenges to meet to turn their now dormant talents into talent.

Future studies should consider using a longitudinal design. This will involve re-examining the young people interviewed now, after 5-10 years of follow-up, to see whether they have been able to turn their dormant talents into talent. Further research is needed to see how children of average ability can develop talent regarding the influence of external environmental factors. Although the investigation of proven talents is not a novel research topic, little is known about dormant talents in regard of the research topic of this paper. Therefore, continuing the current research in a Central European context could also widen our knowledge on the personality of sport and music dormant talents.

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Institutional Review Board Statement: This research was conducted in accordance with the Declaration of Helsinki. The ethical committee of the University of Debrecen approved this study. The research is conducted ethically, the results are reported honestly, the submitted work is original and not (self-)plagiarized, and

authorship reflects the individuals' contributions.

Informed Consent Statement: Informed consent was not required for the study.

Data Availability Statement: Data are available only on request due to ethical restrictions.

Conflicts of Interest: The authors declare no conflict of interest.

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