IJCAS International Journal of Creative and Arts Studies

Volume 12 Number 1, June 2025
p-ISSN 2339-191X | e-ISSN 2406-9760
pp 1 – 13

Emotional Intelligence and Musical Activity: An Ex-Post Facto Study of Musical Practice in Indonesia

Indra Kusuma Wardani
Music Education Department, Faculty of Performing Arts,
Indonesia Institute of the Arts Yogyakarta, Indonesia
Correspondence Author Email: indrakwardani@gmail.com

Abstract
The importance of emotional intelligence in maximizing individual potential has sparked various studies related to this topic. In addition to research focusing on the mechanisms of emotional intelligence, several studies aim to explore ways to develop these skills more efficiently. Music has not escaped the attention of researchers due to numerous claims about its potential to enhance intelligence and optimize individual potential. One such area of focus is ensemble activities in both instrumental and vocal group contexts. The argument and theoretical framework supporting the potential of musical activities to improve emotional intelligence are based on the characteristics of routines in ensembles that overlap with general indicators of emotional intelligence. This research examines the influence of musical ensemble activities on emotional intelligence through an ex-post facto study involving 104 subjects divided into three groups using the adaptation of Goleman's emotional intelligence questionnaire. The subjects are orchestra musicians, choir singers, and those not engaged in musical activities. The selection criteria for musicians/choir singers involved in this study are as follows: They must have at least 5 years of experience in music ensemble. Based on a one-way ANOVA test, there was a significant difference in emotional intelligence scores according to the type of musical activity participated by the respondents ($F(2,101) = 5.254$, $p=.0007$). Post-hoc analysis using the Bonferroni correction revealed a significant difference between the group that did not participate in musical activities and the choir group ($p=.006$), with higher emotional intelligence scores observed in the choir group. No significant differences were found between the orchestra/ensemble group and the other groups ($p>.05$)

***Keywords**: emotional intelligence, music ensemble, musical interaction*

Kecerdasan Emosional dan Aktivitas Musikal:
Studi Ex-Post Facto Praktik Musik di Indonesia

Abstrak
Pentingnya kecerdasan emosional dalam memaksimalkan potensi individu telah memicu berbagai penelitian terkait topik ini. Selain penelitian yang berfokus pada mekanisme kerja kecerdasan emosional, beberapa studi juga bertujuan untuk mengeksplorasi cara-cara mengembangkan keterampilan ini secara lebih efektif. Musik tidak luput dari perhatian para peneliti karena banyak klaim mengenai potensinya dalam meningkatkan kecerdasan dan mengoptimalkan potensi individu. Salah satu fokus kajiannya adalah aktivitas ansambel, baik dalam konteks kelompok vokal maupun instrumental. Argumen dan kerangka teoritis yang mendasari potensi aktivitas musikal dalam meningkatkan kecerdasan emosional didasarkan pada karakteristik rutinitas dalam ansambel yang tumpang tindih dengan indikator umum kecerdasan emosional. Penelitian ini mengkaji pengaruh aktivitas ansambel musik terhadap kecerdasan emosional melalui studi ex-post facto yang melibatkan 104 subjek, yang dibagi ke dalam tiga kelompok berdasarkan adaptasi kuesioner kecerdasan emosional dari Goleman. Subjek terdiri dari musisi orkestra, penyanyi paduan suara, dan individu yang tidak terlibat dalam aktivitas musikal. Kriteria pemilihan musisi dan penyanyi paduan

Received: 04 February 2025
Revised: 03 March 2025
Accepted: 22 May 2025

suara dalam studi ini adalah memiliki pengalaman minimal 5 tahun dalam aktivitas ansambel musik. Berdasarkan hasil uji ANOVA satu arah, ditemukan perbedaan yang signifikan dalam skor kecerdasan emosional berdasarkan jenis aktivitas musik yang diikuti oleh responden ($F(2,101) = 5.254$, $p = 0.007$). Analisis post hoc menggunakan koreksi Bonferroni menunjukkan adanya perbedaan yang signifikan antara kelompok yang tidak mengikuti aktivitas musik dan kelompok paduan suara ($p = 0.006$), dengan skor kecerdasan emosional yang lebih tinggi pada kelompok paduan suara. Tidak ditemukan perbedaan yang signifikan antara kelompok orkestra/ansambel musik dengan kelompok lainnya ($p > 0.05$).

Kata kunci: *kecerdasan emosional, ensambel musik, interaksi musikal*

INTRODUCTION

Research on music emphasizing the non-musical outcomes of musical training has developed rapidly in the last decade. One of the most talked about is the potential of musical training to affect cognitive and emotional intelligence. (Hallam, 2010; Putri & Haryanto, 2019). Emotional intelligence, one of the most explored topics related to music training, can potentially support individuals and human being's success in teamwork (Luca et al., 2001). Empathy, one element of emotional intelligence, is also said to be essential to help with productive and constructive communication (Yüksel PİRGON, 2015), along with the potential to enable individuals to show prosocial behaviour (Bertrand et al., 2018; de Vignemont & Singer, 2006; Decety, 2011; Klein, 2016; Lam, 2012; Singer & Lamm, 2009). Meanwhile, self-motivation, another element of emotional intelligence, also contributes to personal success, ranging from academic, leadership, and musical achievement (Garrido & Requena, 2015). The critical role of emotional intelligence and its elements in optimizing individuals' potential in many fields has increased the study of emotional intelligence. Besides the rise of the study of emotional intelligence and its mechanisms, many studies focus on finding ways to enhance and foster emotional intelligence in individuals efficiently.

Regarding the attempt to enhance emotional intelligence, some studies examine the potential of musical group activity. The basis argumentation and theoretical framework are the characteristics of the routines in musical group activity that intertwined with the dimensions of emotional intelligence (Gonzo, 1977; Maury et al., 2022; Wardani, 2019). For example, in vocal teaching, teachers tend to use metaphorical instructions requiring the students' ability to visualize and imagine the situations (Gonzo, 1977). This practice aligns with one mode of empathy described by Hoffman, known as verbally mediated association. Other research shows that in ensemble groups, individuals learn to recognize themselves and position themselves within a social environment to achieve group goals. Musically, individuals also need to have a personal auditory perspective and a

proportional group auditory perspective simultaneously, which is referred to as empathic listening in the context of social skills (Wardani, 2019). Given the current focus of music education, which also emphasizes the achievement of non-musical aspects, music educators need to understand the mechanisms of ensembles that can be attributed to supporting non-musical achievements. Consequently, various music teaching methods have emerged to produce dual outputs: musical and non-musical skills (Lamont et al., 2012; Pearce et al., 2015). This is also evident in the evolving arts education curriculum, which is shifting towards humanism by emphasizing musical practices that can be applied in non-musical contexts.

Although music and emotional intelligence research has gained popularity, such studies have not been widely conducted in Indonesia. For example, research on choirs in Indonesia primarily discusses technical aspects. (Lucas, 2021; Mita, 2021; Sinaga, 2014) or strategic and managerial (Damara & Milyartini, 2021; Kartika et al., 2019; Tobing, 2018). This has led to choir ensemble activities being viewed as musical activities that do not affect other aspects of an individual's life. Meanwhile, research on orchestras in Indonesia varies widely, such as highlighting issues related to muscle disorders (Wahyuning et al., 2021), managerial (Laksmi, 2023; Murbiyantoro, 2012), and the orchestra's role in socio-cultural context. Meanwhile, research on music and emotional intelligence in Indonesia, such as the work by Putri and Haryanto (Putri & Haryanto, 2019), does not clearly distinguish between active and passive musical activities. (Putri & Haryanto, 2019). Music is viewed as an object of sound that influences an individual's thoughts and feelings, but it does not address musical activities with social interaction and musical interaction within them. One promising study on music and emotional intelligence was written by Natakusuma (Natakusuma & Karyono, 2015), which shows a relationship between emotional intelligence and non-aptitude musical creativity. In the research presented by the author, music is not only seen as an object of sound but also as a social laboratory where interactions among individuals and the characteristics of musical activities become essential factors that have the potential to influence emotional intelligence.

In general, this research will be based on two major theories: the theory of emotional intelligence and musical interaction found in musical ensembles. Emotional intelligence is an important form of intelligence that maximizes human function as individuals and as social beings. Elements of emotional intelligence, such as empathy, can help individuals communicate better, resulting in constructive and productive communication (Yüksel PİRGON, 2015) and also enable individuals to exhibit prosocial behavior (Bertrand et al., 2018; de Vignemont & Singer, 2006; Decety, 2011; Klein, 2016; Lam, 2012; Singer & Lamm, 2009). Meanwhile, another element of emotional intelligence, namely self-motivation, is a crucial factor for individual success in academic contexts, leadership, and musical

achievements (Garrido & Requena, 2015)[9][10]. The importance of emotional intelligence and its elements has led to various research studies on the potential of music in fostering these skills. Rabinowitch et. al. (2013) specifically designed children's music ensemble activities over a considerable period, and it was proven that this intervention fostered empathy-related cognitive skills.

In music ensemble activities, social interaction and musical interaction are the main aspects that receive the most attention. Gonzo (1977) emphasizes that the process of vocal training requires individuals to be capable of imitation, imagination, and metaphorical behavior, which necessitates high-level metacognitive abilities. Kawase (Kawase, 2016) also demonstrates the presence of non-verbal communication among guitar ensemble players as a form of musical interaction as well as social interaction. This aligns with Hoffman's (Hoffman, 2008) idea regarding the emergence of empathy, which also attributes to the processes of imitation, imagination, and perspective-taking. This intersection is believed to create a tendency for individuals to be better at reading the mental states of others and responding appropriately, as one form of social skill (Baron-Cohen, 2009; Blairy et al., 1999; Goldstein & Winner, 2012; T. Rabinowitch, 2015; Zahavi, 2014). This is reinforced by the acknowledgment of a choir conductor in Wardani's research(Wardani, 2022b) which indicates that social interaction often supports musical achievements more than individual musical intelligence within the ensemble.

Considering the significant potential of group musical activities or music ensembles in influencing the social aspects of the individuals involved, various studies have examined how this can further impact social well-being. For example, research by Bailey and Davidson (Bailey & Davidson, 2005) shows that participation in choir activities can enhance the self-esteem and psychosocial well-being of homeless and marginalized individuals. Similar results have been observed in studies involving different subject groups, such as immigrants and refugees (Marie Schuff, 2014), the elderly (Maury et al., 2022), people with disabilities (Dingle et al., 2013), homosexual groups (Latimer, 2008), and the society in general (Livesey et al., 2012). However, these positive impacts do not apply to virtual choirs, which eliminate social interaction(Daffern et al., 2021; Grebosz-Haring et al., 2022; Wardani, 2022a, 2022b; Wardani et al., 2023). This suggests that direct social and musical interactions are exclusive factors that cannot be denied. Thus, theoretically, fostering emotional intelligence in group activities requires interpersonal interaction with specific characteristics.

Unlike several studies on music ensembles in Indonesia that highlight choirs and orchestras from technical, managerial, and socio-cultural function perspectives, this research focuses on examining social interaction and musical interaction within music ensembles and their influence on emotional intelligence. Although the topic

of this research seems similar to that of Natakusuma (Natakusuma & Karyono, 2015), this study differs in its perspective on the causal relationship between musical activities and emotional intelligence. Natakusuma views emotional intelligence as a prerequisite or supporter of musical creativity (input), whereas this research sees emotional intelligence as an output that arises from musical and social interactions within music ensembles (output).

METHOD

Research approach and design

This study was conducted using a quantitative, non-experimental ex post facto approach, emphasizing the differences in the initial conditions of the subjects in each group; in other words, there was no direct manipulation by the researcher. The variables examined in this study were ensemble activity (independent variable) and emotional intelligence (dependent variable).

Subjects

The study involved 104 subjects divided into three groups: the orchestra musician group (n=34), the choir singers' group (n=36), and the group of subjects not involved in any musical ensemble (n=34). The subjects ranged in age from 17 to 35 years, with a mean age of 21.87±3.505. The subjects were selected based on their willingness to complete the survey and were screened according to the following criteria: (1) age not exceeding 35 years, and (2) participation in an ensemble for a minimum of 5 years and (3) never involved in any musical group activity for the non-musicians group. Below is the boxplot of the respondents' ages across the three subject groups.

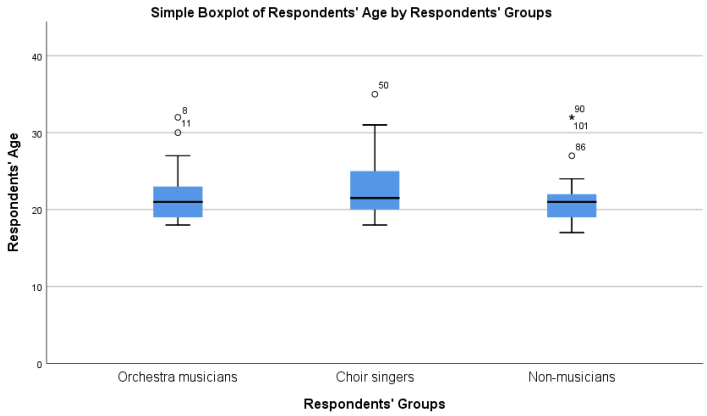

Figure 1. Simple Boxplot of Respondents' Age by Respondents' Groups

Instrument

Data was collected using a self-report questionnaire consisting of two parts: (1) the participant's identity and demographic section, and (2) an adaptation of Goleman's emotional intelligence scale. The first part of the questionnaire was used to map the

initial conditions, categorize participants into appropriate groups, and identify participants' general musical experiences in ensembles. The second part of the questionnaire contained 50 statement items on a 5-point Likert scale measuring the dimensions of emotional intelligence: self-awareness, emotion management, self-motivation, empathy, and social skills. Due to the flaw in the translation process, the items used for further analysis were 34 to ensure each item has a Person's r correlation > 0.3 with the total item. The reliability test results for all items indicated that the scale was reliable, with Cronbach's alpha of α=.891, equivalent to 89.1%.

Procedure

The survey form was distributed online through various social media and chat applications. The questionnaire can be finished in approximately 7 minutes, under the general suggestion of the administrative time of the online survey. Each subject read and signed a consent form to participate in the study, which included an explanation of data confidentiality and its use in the research. Subjects who agreed proceeded to complete the questionnaire, while potential subjects who did not consent could leave the survey page. All survey data were collected via Google Forms and processed using data processing software.

Data Analysis

The measurement data were processed using SPSS v.23 software with a significance level of 0.05, starting from data cleansing, classical assumption tests (normality & homogeneity), and analysis of variance (ANOVA) to compare the mean differences among the three groups simultaneously. A Bonferroni post-hoc test was done to further analyze the differences between the groups.

RESULTS

Descriptive Statistics

The first test conducted is descriptive statistics to understand the trends and general overview of the data collected. Below are the descriptive statistics of the emotional intelligence scores for the three subject groups:

Descriptives

Score of Emotional Intelligence

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Orchestra musicians	34	131.1471	14.29586	2.45172	126.1590	136.1351	104.00	163.00
Choir singerss	36	134.6389	14.01663	2.33610	129.8963	139.3814	111.00	175.00
Non-musicians	34	123.5882	15.25166	2.61564	118.2667	128.9098	106.00	166.00
Total	104	129.8846	15.10887	1.48155	126.9463	132.8229	104.00	175.00

The results of the descriptive statistics calculations show differences in the average emotional intelligence scores of subjects in the three groups, with the choir group having the highest average at 134.63, followed by the orchestra group at 131.14, and the group not engaged in musical activities having the lowest average at 123.58. However, further analysis is needed to determine the significance of these score differences.

Next, classical assumption tests were conducted, starting with the normality test. The Shapiro-Wilk results indicate that the emotional intelligence scores of subjects in the three groups meet the normality assumption, with all p values > 0.05. The homogeneity test shows that the average emotional intelligence scores of subjects in the three groups meet the homogeneity assumption, indicating the absence of significant differences in variance. This is demonstrated by a p-value > 0.05 for the homogeneity tests based on mean, median, median with adjusted degrees of freedom, and trimmed mean.

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
EI Score	Based on Mean	.003	2	101	.997
	Based on Median	.004	2	101	.996
	Based on Median and with adjusted df	.004	2	93.872	.996
	Based on trimmed mean	.003	2	101	.997

Comparing the means

A One-way ANOVA test was conducted to determine whether there were differences in the means among the three subject groups. The results of this test indicate a significant difference among the three subjects, with F(2) = 5.254; p=.007, as shown in the following table.

ANOVA

sumEI_new

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2215.810	2	1107.905	5.254	.007
Within Groups	21296.806	101	210.859		
Total	23512.615	103			

To further analyze the differences among the groups, a Bonferroni post hoc was done as the table below:

Multiple Comparisons

Dependent Variable: Emotional Intelligence score
Bonferroni

(I) Respondent's groups	(J) Respondents' group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Orchestra musicians	Choir singers	-3.49183	3.47260	.951	-11.9459	4.9622
	Non-musicians	7.55882	3.52186	.103	-1.0152	16.1328
Choir singers	Orchestra musicians	3.49183	3.47260	.951	-4.9622	11.9459
	Non-musicians	11.05065*	3.47260	.006	2.5966	19.5047
Non-musicians	Orchestra musicians	-7.55882	3.52186	.103	-16.1328	1.0152
	Choir singers	-11.05065*	3.47260	.006	-19.5047	-2.5966

*. The mean difference is significant at the 0.05 level.

The result showed a statistically significant difference in emotional intelligence scores between non-musicians and choir singers where choir singers score higher. Meanwhile, there was no significant difference in emotional intelligence scores between choir singers and orchestra musicians or between non-musicians and orchestra musicians.

DISCUSSION

The analysis results revealed a significant difference in emotional intelligence scores between choristers and non-musicians, but no significant difference between orchestral musicians and non-musicians. This suggests that choral activities are considered more potential in developing emotional intelligence compared to orchestral musical activities. This difference in potential is more evident when compared to individuals who are not involved in any group musical activities, or non-musicians in this study. In other words, the survey results indicate that participants involved in orchestral activities did not exhibit significantly different emotional intelligence from non-musicians.

However, if we refer to previous research and theories, group musical activities—whether instrumental or vocal-based—are said to hold the potential to enhance aspects related to emotional intelligence. For instance, Kawase (2016) demonstrated that non-verbal communication occurring within a guitar ensemble has a reciprocal relationship with empathy, which serves as the basis of the communication taking place. This is also explained by Keller (2013), who stated that interpersonal interaction in an ensemble requires cognitive-motor skills, the underlying dimensions of which—anticipation, attention, and adaptation—resemble the concept of cognitive empathy.

Keller explains that one of the ensemble skills that enables individuals to communicate effectively with co-players and achieve musical goals as an ensemble is cognitive-motor skill. This skill refers to an individual's ability to understand non-

verbal musical communication patterns and translate them into motor responses in the form of musical performance. Keller divides cognitive-motor skills into anticipation, attention, and adaptation. Anticipation allows individuals to read gestural cues or facial expressions and anticipate the musical phrases or sounds produced by co-players, enabling them to prepare their musical responses. Attention refers to the musician's ability to observe and assess gestural cues. In contrast, adaptation refers to the musician's ability to adjust repeatedly to various musical cues that are continuously changing.

The ability for non-verbal communication and cognitive-motor skills are evident in musical interactions within ensemble groups. Singers or musicians need to possess all three dimensions to achieve musical goals as a group. In addition to having proficient musical technical skills, the ability to read gestures and understand the intentions of cues given by both the conductor and co-players become crucial. From the perspective of cognitive empathy, this skill represents the ability to understand the mental states of other individuals, which includes efforts to comprehend the illiteral meanings of gestural cues and facial expressions. By employing this ability during the years of involvement in a musical ensemble, the musicians might have internalised this cognitive process in understanding others' mental states. Thus, this might explain the inclination to empathy in ensemble musicians.

However, the significant difference in emotional intelligence between choristers and orchestral musicians raises several questions. First, are there differences in the characteristics of musical activities from the perspective of interpersonal interaction that might account for this outcome? Second, does the culture of choir and orchestra in Indonesia differ from that in other countries? Third, do Goleman’s emotional intelligence dimensions, which were used as tools in this study, not specifically align with the musical activities of the two groups being examined? Since the design of this study does not directly provide data to answer these three questions, further investigation is needed to explore these issues.

CONCLUSION

There is a significant difference in emotional intelligence between choristers and non-musicians, but no significant difference between orchestral musicians and non-musicians, indicating that choir activities may have greater potential to foster emotional intelligence in individuals compared to orchestral activities. However, further investigation is needed to understand the reasons behind this difference, particularly from the perspectives of social interaction within each musical group, cultural differences in musical practices between Indonesia and the countries where earlier studies were conducted, and the construct of emotional intelligence used in the measurement.

REFERENCES

Bailey, B. A., & Davidson, J. W. (2005). Effects of group singing and performance for marginalized and middle-class singers. In *Psychology of Music* (Vol. 33, Issue 3, pp. 269–303). SAGE Publications Ltd. https://doi.org/10.1177/0305735605053734

Baron-Cohen, S. (2009). Autism: The empathizing-systemizing (E-S) theory. *Annals of the New York Academy of Sciences*, *1156*, 68–80. https://doi.org/10.1111/j.1749-6632.2009.04467.x

Bertrand, P., Guegan, J., Robieux, L., McCall, C. A., & Zenasni, F. (2018). Learning empathy through virtual reality: Multiple strategies for training empathy-related abilities using body ownership illusions in embodied virtual reality. In *Frontiers Robotics AI* (Vol. 5, Issue MAR). Frontiers Media S.A. https://doi.org/10.3389/frobt.2018.00026

Blairy, S., Herrera, P., & Hess, U. (1999). Mimicry and the judgment of emotional facial expressions. *Journal of Nonverbal Behavior*, *23*(1), 5–41. https://doi.org/10.1023/A:1021370825283

Daffern, H., Balmer, K., & Brereton, J. (2021). Singing together, yet apart: The experience of UK Choir members and facilitators during the Covid-19 pandemic. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.624474

Damara, I., & Milyartini, R. (2021). Strategi pelatihan paduan suara mahasiswa Universitas Padjadjaran di masa pandemi Covid-19. *Swara: Jurnal Antologi Pendidikan Musik*, *1*(3), 16–26.

de Vignemont, F., & Singer, T. (2006). The empathic brain: how, when and why? *Trends in Cognitive Sciences*, *10*(10), 435–441. https://doi.org/10.1016/j.tics.2006.08.008

Decety, J. (2011). Dissecting the neural mechanisms mediating empathy. *Emotion Review*, *3*(1), 92–108. https://doi.org/10.1177/1754073910374662

Dingle, G. A., Brander, C., Ballantyne, J., & Baker, F. A. (2013). "To be heard": The social and mental health benefits of choir singing for disadvantaged adults. *Psychology of Music*, *41*(4), 405–421. https://doi.org/10.1177/0305735611430081

Garrido, D. C., & Requena, S. O. (2015). Music and leadership: The role of the conductor. *International Journal of Music and Performing Arts*, *3*(1), 84–88. https://doi.org/10.15640/ijmpa.v3n1a8

Goldstein, T. R., & Winner, E. (2012). Enhancing empathy and theory of mind. *Journal of Cognition and Development*, *13*(1), 19–37. https://doi.org/10.1080/15248372.2011.573514

Gonzo, C. L. (1977). 1977 Gonzo-metaphoric behavior in choral conducting. *The Choral Journal*, *17*(7), 8–12.

Grebosz-Haring, K., Schuchter-Wiegand, A. K., Feneberg, A. C., Skoluda, N., Nater, U. M., Schütz, S., & Thun-Hohenstein, L. (2022). The psychological and biological impact of "in-person" vs. "virtual" choir singing in children and adolescents: A pilot study before and after the acute phase of the COVID-19 outbreak in Austria. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.773227

Hallam, S. (2010). The power of music: Its impact on the intellectual, social and personal development of children and young people. *International Journal of Music Education*, *28*(3), 269–289. https://doi.org/10.1177/0255761410370658

Hoffman, M. L. (2008). Empathy and prosocial behavior. In M. L. Haviland-Jones & L. Barrett (Eds.), *Handbook of Emotions* (Third, pp. 440–455). The Guilford Press.

Kartika, W., Mering, A., & Sanulita, H. (2019). Analisis peran pelatih paduan suara dalam meningkatkan keterampilan menyanyi peserta paduan suara di SMK. *Jurnal Pendidikan Dan Pembelajaran Khatulistiwa*, *8*(3), 1–8.

Kawase, S. (2016). Associations among music majors' personality traits, empathy, and aptitude for ensemble performance. *Psychology of Music*, *44*(2), 293–302. https://doi.org/10.1177/0305735614568697

Keller, P. (2013). Musical ensemble performance: A theoretical framework and empirical findings on interpersonal coordination. *International Symposium on Performance Science*, 271–285.

Keller, P. E. (2012). Mental imagery in music performance: Underlying mechanisms and potential benefits. *Annals of the New York Academy of Sciences*, *1252*(1), 206–213. https://doi.org/10.1111/j.1749-6632.2011.06439.x

Klein, N. (2016). *Prosocial behavior increases perceptions of meaning in life*. *9760*(July). https://doi.org/10.1080/17439760.2016.1209541

Laksmi, A. S. (2023). Peran direktur musik dalam Symphony Orchestra dan Light Music Orchestra: Kelompok orkestra di Yogyakarta. *Ekspresi*, *12*(1), 34–42.

Lam, C. M. (2012). Prosocial involvement as a positive youth development construct: A conceptual review. *The Scientific World Journal*, *2012*. https://doi.org/10.1100/2012/769158

Lamont, A., Daubney, A., & Spruce, G. (2012). Singing in primary schools: Case studies of good practice in whole class vocal tuition. *British Journal of Music Education*, *29*(2), 251–268. https://doi.org/10.1017/S0265051712000083

Latimer, M. E. (2008). "Our voices enlighted, heal, and empower:" A Mixed Methods Investigation of Demography, Sociology, and Identity Acquisition in a Gay Men's Chorus. *International Journal of Research in Choral Singing*, *3*(1), 23–38.

Livesey, L., Morrison, I., Clift, S., & Camic, P. (2012). Benefits of choral singing for social and mental wellbeing: Qualitative findings from a cross-national survey of choir members. *Journal of Public Mental Health*, *11*(1), 10–26. https://doi.org/10.1108/17465721211207275

Luca, J., Tarricone, P., & Luca, J. (2001). *Does emotional intelligence affect successful teamwork? Does emotional intelligence affect successful teamwork? Does Emotional Intelligence Affect Successful Teamwork?* https://ro.ecu.edu.au/ecuworks/4834

Lucas, C. (2021). Metode kreatif vocalizing untuk meningkatkan kualitas bernyanyi paduan suara. *Danum Pambelum: Jurnal Teologi Dan Musik Gereja*, *1*(2),

229–235. https://doi.org/10.54170/dp.v1i2.64

Marie Schuff, H. T. (2014). *"A place where I can contribute:" Inclusion and participation in a multicultural gospel choir* (Vol. 1, Issue 2).

Maury, S., Vella-Brodrick, D., Davidson, J., & Rickard, N. (2022). Socio-emotional benefits associated with choir participation for older adults related to both activity characteristics and motivation factors. *Music and Science*, *5*. https://doi.org/10.1177/20592043221137759

Miksza, P. (2022). Practice. *The Oxford Handbook of Music Performance: Development and Learning, Proficiencies, Performance Practices, and Psychology: Volume 1*, *1*(March), 153–172. https://doi.org/10.1093/oxfordhb/9780190056285.013.9

Mita, A. R. (2021). Metode dan teknik vokal pada paduan suara Gregorius di paroki Aloysius Gonzaga Surabaya. *Jurnal Pendidikan Sendratasik*, *10*(1), 41–53.

Murbiyantoro, H. (2012). Manajemen produksi pertunjukan Surabaya Symphoni Orchestra di Surabaya sebagai sarana pendidikan apresiasi musik. *Chatarsis*, *1*(1).

Natakusuma, H. M., & Karyono, K. (2015). Hubungan antara kecerdasan emosi dengan kreativitas bermusik non aptitude pada musisi band di Kota Pati, Jawa Tengah. *Jurnal EMPATI*, *4*(3), 96–101. https://doi.org/10.14710/empati.2015.12982

Pearce, E., Launay, J., & Dunbar, R. I. M. (2015). The ice-breaker effect: Singing mediates fast social bonding. *Royal Society Open Science*, *2*(10). https://doi.org/10.1098/rsos.150221

Putri, A. A., & Haryanto, H. (2019). Perbedaan kecerdasan emosional pada mahasiswa yang mengikuti UKM musik dan mahasiswa yang mengikuti UKM non-musik. *Gadjah Mada Journal of Psychology (GamaJoP)*, *4*(2), 119. https://doi.org/10.22146/gamajop.46358

Rabinowitch, T. (2015). *How, rather than what type of, music increases empathy*. *10*(1), 96–98.

Rabinowitch, T. C., Cross, I., & Burnard, P. (2013). Long-term musical group interaction has a positive influence on empathy in children. *Psychology of Music*, *41*(4), 484–498. https://doi.org/10.1177/0305735612440609

Sinaga, T. (2014). Teknik bernyanyi dalam paduan suara. *Jurnal Sendratasik Universitas Negeri Medan*, *7*(2), 281–293.

Singer, T., & Lamm, C. (2009). The social neuroscience of empathy. *Annals of the New York Academy of Sciences*, *1156*, 81–96. https://doi.org/10.1111/j.1749-6632.2009.04418.x

Smith, B. P. (2005). Goal orientation, implicit theory of ability, and collegiate instrumental music practice. *Psychology of Music*, *33*(1), 36–57. https://doi.org/10.1177/0305735605048013

Tobing, O. (2018). *Gondang: Jurnal Seni dan Budaya Manajemen Paduan Suara Consolatio Universitas Sumatera*. *2*(2), 57–65.

Wahyuning, D. G., Imanurrohmah, Z., Yuliadarwati, N. M., & Rosidah, N. (2021). Literature review : Analisis musculoskeletal disorders pada musisi orkestra jenis string. *Physiotherapy Health Science (PhysioHS)*, *3*(1), 11–17. https://doi.org/10.22219/physiohs.v3i1.17036

Wardani, I. K. (2019). *Korelasi Keterampilan Empatik dan Kohesi Musikal (Studi Kasus: PSM ISI Yogyakarta)*.

Wardani, I. K. (2022a). Back to basic: What is missing in the virtual choir as a practice? *The 10th International Conference for Asia Pacific Arts Studies: Art in the Post-Digital Age*, *1*, 62–72.

Wardani, I. K. (2022b). Virtual choir: To sing together, individually. *International Journal of Creative and Arts Studies*, *9*(2), 105–116. https://doi.org/10.24821/ijcas.v9i2.8226

Wardani, I. K., Oktadus, H. Y., Djohan, & Sittiprapaporn, P. (2023). Artistic experiences and social interaction in virtual choir. *2023 Joint International Conference on Digital Arts, Media and Technology with ECTI Northern Section Conference on Electrical, Electronics, Computer and Telecommunications Engineering (ECTI DAMT & NCON)*, 419–422. https://doi.org/10.1109/ECTIDAMTNCON57770.2023.10139589

Yüksel PİRGON, A. (2015). The effect of music education on the empathy of medical students. In *International Journal on New Trends in Education and Their*. www.ijonte.org

Zahavi, D. (2014). Empathy and other-directed intentionality. *Topoi*, *33*(1), 129–142. https://doi.org/10.1007/s11245-013-9197-4