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The Impact of Listening Contexts on Felt Emotions: A Study of Christian Worship Music

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ABSTRACT

The aim of this study was to investigate the impact of listening contexts on felt emotions in Christian worship music. Participants (5 Christians and 13 non-Christians) listened to the same choral worship music in two listening contexts. One was to listen to the recordings independently in a secular, casual context. The other was to attend an Evensong service at Durham Cathedral. Participants rated their felt emotions (GEMS-25) and enjoyment of music in each listening context. The results showed that the Cathedral context can evoke higher intensity levels of Wonder, Transcendence, Joyful Activation, Tenderness, and Enjoyment, which highlighted the importance of the religious context in eliciting stronger emotions and enjoyment, even for non-believers. However, due to some limitations of this study, the differences in felt emotions between Christians and non-Christians were inconclusive. Future research should address the limitations and explore the complex interplay between religious beliefs, cultural backgrounds, and felt emotions of music in religious contexts.

1. INTRODUCTION

Background. Emotions and music are associated, as emotions can be expressed and aroused by music (Juslin & Sloboda, 2010). Previous research revealed that many musical features, such as vocal melody and rhythm (Beveridge & Knox, 2017), pitch (Jaquet et al., 2012), music genres (Cook et al., 2017), can affect the felt emotions of music. Externally, the individual factors of the listeners (Xu et al., 2020), acoustic spaces (Pätynen and Lokki, 2016) and social contexts (Egermann et al., 2011) also have impacts on the felt emotions of music.

Regarding acoustic spaces, Pätynen and Lokki (2016) discovered that listening to the music in a purpose-built music space can evoke stronger emotional responses. The study by Pätynen and Lokki (2016) was primarily concerned with the effect of concert hall acoustics on participants' psychophysiological responses to classical orchestral music. The same excerpt was used for all trials in this investigation, but the music was convolved with distinct acoustic effects from various concert halls each time. The results showed that the highly ranked concert halls elicited stronger emotional responses and enjoyable sensations to the music, which were essential to the concert experiences of the audiences.

Social contexts can also affect the felt emotions of music. Egermann et al. (2011) investigated whether listening to music in a group setting alters emotional experiences. This study included 14 participants from an amateur orchestra who listened to classical music excerpts in both solitary and group settings. Participants in the solitary context had considerably higher levels of Skin Conductance Response (SCR) and chills than in the group context, but there was no difference in self-reported emotional scores between the two contexts.

The emotions evoked by religious music present an intriguing and meaningful topic of study. Many religions use music in their worship (Demmrich, 2018). Music has been used since the establishment of the church, and choral music has been widely practised since the English Reformation (Wilson-Dickson, 1997). According to Perlmutter (2020), Christian worship music, particularly choral music, is not only appreciated and sung by Christians, but also by many non-believers.

Previous research on religious music has discovered that music can trigger religious emotions, such as sensing the divinity and holiness, feeling transcendence, which all enhanced the believer's mood and the religious experience in the service (Walter & Altorfer, 2022). Believers show stronger emotional responses than non-believers. In Miller and Strongman's (2002) research about the relationship of the Pentecostal-Charismatic (P-C) style of music and worship practices to religious experience, the interviewed P-C church members strongly agreed on the importance of worship music in increasing their mood in the service. Moreover, when sacred music was presented to both Christian (P-C church members) and non-Christian participants, Christians displayed more "energetic" and "awesome" emotional responses to the music. Thus, Miller and Strongman (2002) proposed that varied

emotional responses between Christians and non-Christians could be attributed to familiarity and association with the music.

The impact of religious space acoustics has also been studied in the past. Algargoosh et al. (2022) evaluated the effect of acoustic features in both Islamic and Christian worship places on the felt emotions associated with worship music. Participants were given both original recordings of worship music and recordings which stimulated the acoustics of worshiping places. The visual worship places were also recreated using virtual reality. Both qualitative and quantitative data were collected, including psychological self-reported feelings and physiological heart rate responses. Recordings with acoustic effects elicited higher emotional and physiological reactions, particularly increased in positive emotions such as “inspired”, “cheerful”, and “thrilled”. Moreover, participants who were more familiar with the music and the acoustic space demonstrated stronger emotional responses and higher heart rate.

Two major research gaps were identified based on past studies. First, many studies on the emotions evoked by Christian worship music were conducted in experimental settings, where music stimuli were generated and convolved by computer and participants listened to the music in music rooms or labs (e.g., Algargoosh et al., 2022; Pätynen and Lokki, 2016). Second, research has usually focused on particular factors such as the acoustic environment and social context (Egermann et al., 2011), rather than the whole listening context. Although experimental settings enable greater control over variables and produce more specific results, they may be less representative of real-life situations. For example, Egermann et al. (2011) found little difference in perceived emotions when listening to music alone versus in a group context, which could be attributed to the experimental setting, where participants were psychologically restricted.

To improve the real-life relevance, this study focused on the concept of “listening context”, which is an assemblage of both tangible and intangible contextual elements. The acoustic environment, worship service and source of music are all tangible, yet the meanings and connotations of the place and the service are intangible. Furthermore, the listening context of attending an actual church service expanded the music into "musicking," which refers to the actions of making and listening to music (Small, 1998).

Investigating the impact of listening contexts on the felt emotions of Christian worship music is connected to the real world in several aspects. Firstly, even though conventional worship services take place in the church, the recent COVID-19 pandemic has brought changes to religious services, that services were moved from the church into live streaming at home (Bryson et al., 2020). The setting at home is considered more secular and private, the acoustics are drier than in the church, and believers listened to worship music from electronic devices instead of live music played in the church. As a result of the change in listening, the experience with worship music has also changed. Secondly, as Perlmutter (2020) points out, non-Christians may also be attracted to Christian worship music. This attraction is most likely due to the characteristics of the worship music; however, because the acoustics of the worship space have been shown to have a significant impact on believers' emotions (Algargoosh et al., 2022), it would be worthwhile to expand the research to investigate whether the listening context of being in a church service can contribute to the attraction of Christian worship music to non-believers.

Research questions and aims. To address research gaps and expand on previous studies, this study’s research question is “Do listening contexts impact the felt emotions of Christian worship music? The main aim is to explore the difference in non-religious (listening to recordings) and religious (live Evensong in the Cathedral) contexts listeners’ felt emotions of worship music. Since previous research demonstrated different felt emotions between Christian and non-Christian participants (Miller & Strongman, 2002), the secondary aim is to explore if the felt emotions of worship music are different between Christians and non-Christians.

Hypotheses. Two hypotheses were made. First (H1), based on the impacts of acoustic environments on felt emotions (Algargoosh et al., 2022), it was predicted that listening contexts can affect the felt emotions of Christian worship music, that is, the participants would report higher intensity levels in felt emotions when listening in the church. Moreover, according to Miller and Strongman (2002), the second hypothesis (H2) predicted that Christian participants would perceive higher intensity levels of emotions in worship music than non-Christian participants in both listening contexts.

2. METHOD

Design. This study employed a causal, within-participants design to assess the effects of listening contexts, using primarily quantitative but also a few qualitative questions. The listening context was the independent variable. One was in a casual non-religious context of listening to the recordings of Christian worship music individually (Recording context), the other was a religious context of attending an Evensong service in Durham Cathedral (Cathedral context), where the worship music were sung by the choir. The dependent variable was felt emotions,

which were quantified using the retrospective GEMS-25 scale (Zentner et al., 2008). A qualitative open-ended question was also asked on whether participants felt different emotions in different listening contexts and why. To facilitate data collection and analysis, all questions were presented via Qualtrics online questionnaires.

Participants. Convenience sampling was used for recruiting participants, project flyers were directly sent to friends and classmates. Although 19 individuals signed up to participate, only 18 finished the entire experiment, hence data analysis was reduced to the 18 completed responses. All participants were aged between 18 - 22 (M = 20.11). Most participants were female (n = 12), 4 were male, and 1 was non-binary. According to their self-described cultural backgrounds, 12 participants identified as Asian, 3 as white European, and 2 as mixed. 3 participants were considered musicians (OMSI > 500).

Regarding religious beliefs, 13 participants indicated that they are not Christian. 5 participants were Christian, in which 3 attended churches regularly. Half of the participants had experience of singing in chapel choir while the other half did not. 7 participants reported that they listen to church music outside religious context, mainly for relaxation. The self-reported familiarity to church music (1 = Not familiar at all; 5 = Extremely familiar) is displayed in Figure 1. Christian participants (M = 3.20, SD = 1.10) on average indicated being more familiar to church music than Non-Christians (M = 2.23, SD = 1.01). Those who had experience singing in chapel choirs (M = 3.22, SD = 0.83) reported higher levels of familiarity to church music than those with no experience (M = 1.78, SD = 0.83), and was statistically significant ($t(16) = 3.68$, p = .002), as demonstrated in Figure 2.

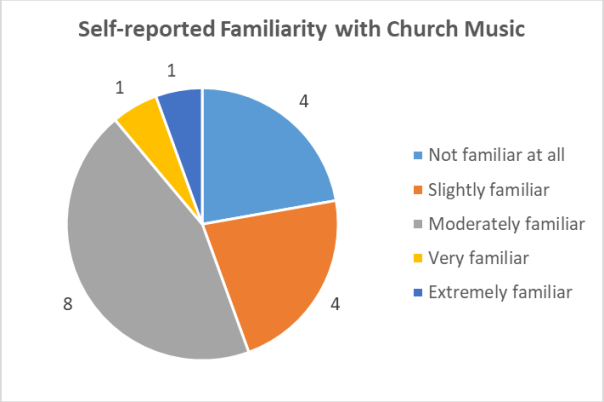

Figure 1. The self-reported familiarity with church music of participants

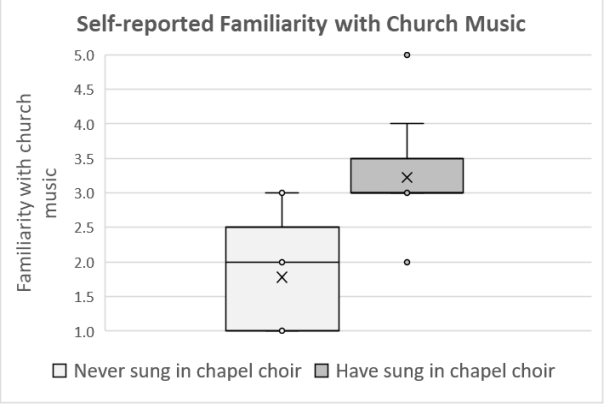

Figure 2. Boxplot of the self-reported familiarity with church music of participants who never sung in chapel choir and participants who have sung in chapel choir.

Materials/Stimuli. This study used two online questionnaires. The first questionnaire contained an information sheet, consent form and demographic questions asking about participants' background, where age, gender, cultural background, music expertise, religion, chapel choir experience, familiarity with church music were included. It also asked if the participants listen to church music outside religious contexts. Cultural background

was self-descriptive, and music expertise was measured using Ollen-MSI (Ollen, 2006). Moreover, Christian participants were asked about their frequency of attending church service.

The second questionnaire, which was used following each listening context, consisted of questions about felt emotions. The major measurement of felt emotions was the pre-established GEMS-25 scale (1 = Not at all, 5 = Very much) (Zentner et al., 2008), which was randomised for each participant in Qualtrics. Its 25 emotions were assigned to 9 musical emotion categories: Wonder, Transcendence, Power, Tenderness, Nostalgia, Peacefulness, Joyful Activation, Sadness and Tension. Following the GEMS-25, an optional question asked for other emotions perceived. Familiarity (1 = Not familiar at all, 5 = Extremely familiar) with the music stimuli and Enjoyment (1 = Not at all, 5 = Very much) were also included. Finally, there was an open-ended question asking if the perceived emotions and/or intensity levels differed between the two listening environments and why, as well as a space to provide additional comments on the study.

Same music stimuli were used in both listening contexts. On the designated date of the Cathedral context trial, Durham Cathedral's service calendar featured *Herbert Brewer – Magnificat in D* and *Thomas Tallis – If you love me*. These pieces were sung by the choir during the Evensong service. Recordings of the same pieces were found on YouTube (Gloucester Cathedral Choir, 2015; The Cambridge Singers, 2014), and were provided to the participants for the Recording context trial. Lyrics of these pieces were included in the YouTube videos, and participants were free to decide on whether to see the lyrics when listening to music. In the Cathedral context trial, song texts and Evensong procedure were also provided by Durham Cathedral in the form of booklets.

Procedure. This study included two trials for the two listening contexts, with trials one week apart. Participants were given the first questionnaire after signing up for this study to consent to participation and answer demographic questions. To minimise the order effect (Strack, 1992), 18 individuals were divided into two groups based on demographic information. One group began with the Recording context trial, whereas the other group began with the Cathedral context trial.

The data collection period lasted three weeks. Participants in Group A (n = 9) were sent the Qualtrics questionnaire in the first week, which included recordings of music stimuli and questions about felt emotions. Participants were advised to listen to the recordings independently in a quiet, casual environment, such as bedrooms or libraries. The page with music recordings contained a timer to ensure that all participants had listened to the music before answering questions. Participants had a full day to complete the questionnaire. In the second week, both groups attended a full Evensong service in Durham Cathedral. The questionnaire about felt emotions was emailed to participants after the service, and they were instructed to report on their felt emotions of the music sung during the service, and to complete the questionnaire by the end of the day. One week after the Evensong service, Group B (n = 9) took over the Recording context, following the same procedure as Group A.

Statistical Analyses. Excel was used for statistical analysis. After reviewing the obtained data, participants' mean ratings of the 9 musical emotions (Zentner et al., 2008) and Enjoyment in both listening contexts were calculated. T-tests were used to compare the means between the two listening contexts, then between Christian and non-Christian participants, and between participants who had and did not have chapel choir experiences. For the open-ended question about the different emotions and/or intensity levels felt in different listening contexts, thematic analysis was applied. Codes were created for each descriptive response, which were then grouped into themes (Braun & Clarke, 2006).

3. RESULTS

Familiarity with the music stimuli. In both recording contexts, most participants self-reported of being slightly familiar with the music stimuli. The t-tests comparing the mean Familiarity of Christian and non-Christian participants in both listening contexts revealed no statistical significance ($p < .05$). When comparing the mean Familiarity between participants who had chapel choir experience and those without, the p-values were much smaller than the comparisons between Christians and non-Christians in both listening contexts. The Cathedral context indicated a statistical significance, where the participants with chapel choir experience self-reported of being more familiar with the music stimuli. The mean Familiarity and results of t-tests are in Table 1.

Table 1. The mean Familiarity (*SD* in brackets) and t-tests results of Christian, Non-Christian participants, participants with chapel choir experience and those without in the two listening contexts.

Types of Participants	Cathedral Context Mean Familiarity	Cathedral Context T-tests Results	Recording Context Mean Familiarity	Recording Context T-test Results
Christian (n = 5)	2.46 (1.30)	(t(6) = -0.52, p = .622)	2.60 (1.52)	(t(5) = -0.74, p = .494)
Non-Christian (n = 13)	2.80 (1.05)		2.08 (0.76)	
With Chapel Choir Experience (n = 9)	3.22 (1.09)	(t(12) = -3.21, p = .008)	2.67 (1.12)	(t(13) = -2.05, p = .061)
Without Chapel Choir Experience (n = 9)	1.89 (0.60)		1.78 (0.67)	

Felt emotions (GEMS-25) and Enjoyment between the two listening contexts. All mean musical emotions and Enjoyment were higher in the Cathedral context than the Recording context (Table 2). The results of t-tests showed statistical significance in Wonder (t(17) = 3.76, p = .002), Transcendence (t(17) = 3.10, p = .007), Tenderness (t(17) = 2.26, p = .037), Joyful Activation (t(17) = 2.65, p = .017) and Enjoyment (t(17) = 2.15, p = .046), where the Cathedral context evoked evident higher intensity levels (Figure 3). Several other emotions excluded in GEMS-25 were also reported by participants. These include Tranquil (n = 1) and Grounded (n = 1) in the Recording context, and Sombre (n = 1) in the Cathedral context. Correlations between the intensity level of each musical emotion and Enjoyment of both listening contexts were calculated, but none of the correlation coefficients indicated large effect size (r > .50, Cohen, 1977). Also, in both listening contexts, no large effect size was observed in the correlation coefficients between Enjoyment and Familiarity with the music stimuli, and Enjoyment and Music Expertise.

Table 2. The means (*SD* in brackets) of the 9 musical emotions and Enjoyment of the piece.

Musical emotion category	Cathedral Context Mean	Recording Context Mean
Wonder	3.14 (0.80)	2.61 (0.74)
Transcendence	3.02 (0.68)	2.52 (0.68)
Power	2.29 (1.01)	2.02 (0.72)
Tenderness	3.49 (0.95)	3.24 (0.91)
Nostalgia	3.35 (0.88)	3.11 (0.93)
Peacefulness	4.02 (0.93)	3.91 (0.71)
Joyful Activation	2.16 (0.89)	1.85 (0.71)
Sadness	2.21 (1.10)	1.86 (0.92)
Tension	1.71 (0.94)	1.44 (0.59)
Enjoyment	4.18 (0.65)	3.67 (1.28)

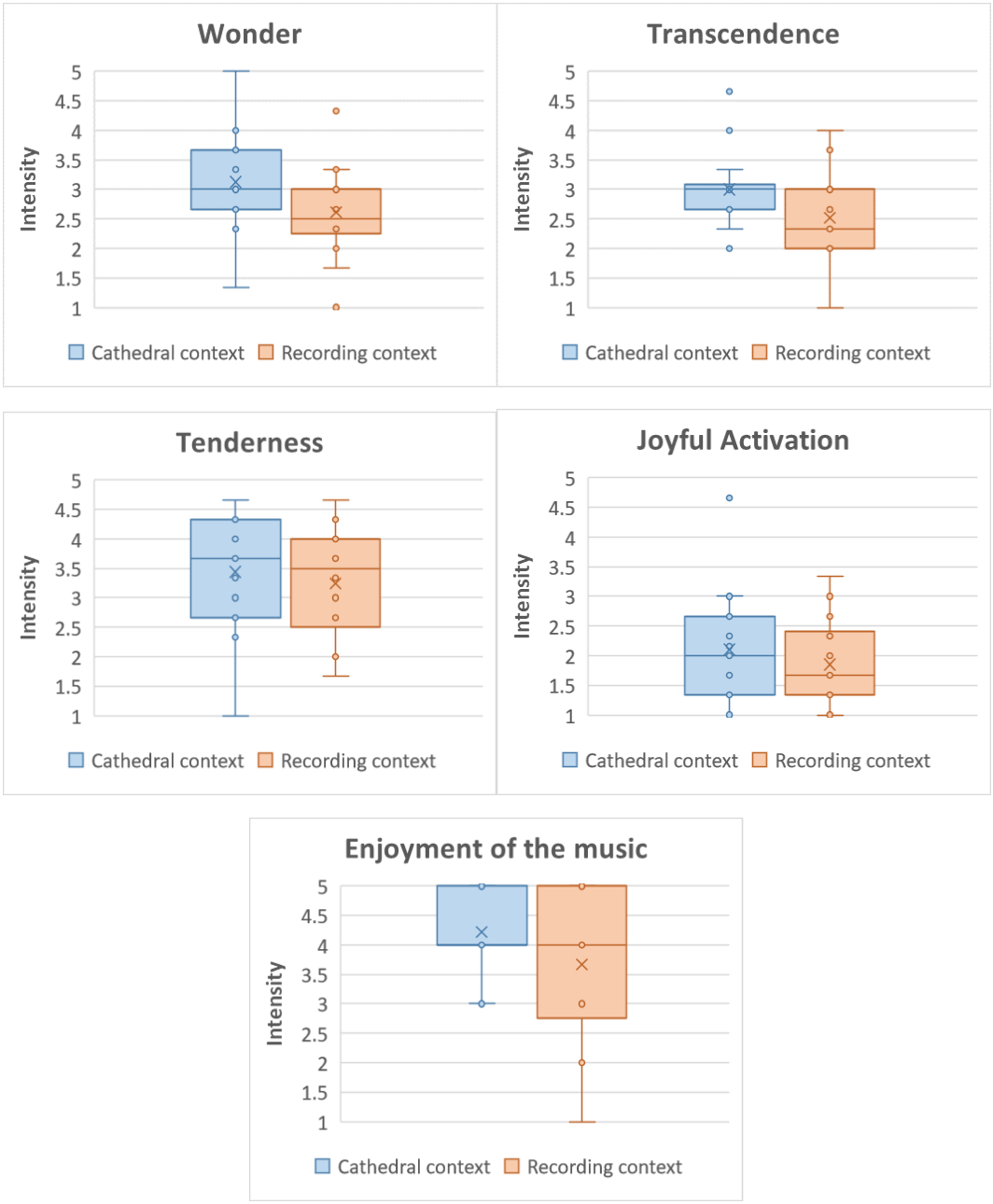

Figure 3. Boxplots summarising participants' self-reported intensity levels Wonder, Transcendence, Tenderness, Joyful Activation and Enjoyment in Cathedral context and Recording context. Mean values are indicated by the "×" symbol on the plots.

Explorations of felt emotions between Christian and non-Christian participants. T-tests were used to compare the means of felt emotion and Enjoyment between Christian (n = 5) and non-Christian participants (n = 13). The details of the mean results are in Appendix 1. In both listening contexts, Christians perceived higher intensity in Tenderness and Peacefulness. In addition, Christians had higher Enjoyment than non-Christians in the Recording context, but not in the Cathedral context. Results of t-tests did not show statistically significant higher intensity levels in any musical emotions and Enjoyment among Christian participants in both listening contexts. However, Tension ($t(16) = 2.34$, $p = .033$) in the Recording context, and Sadness ($t(16) = 2.34$, $p = .032$) in the Cathedral context were statistically significant, where non-Christian participants reported higher intensity levels than Christian participants (Figure 4).

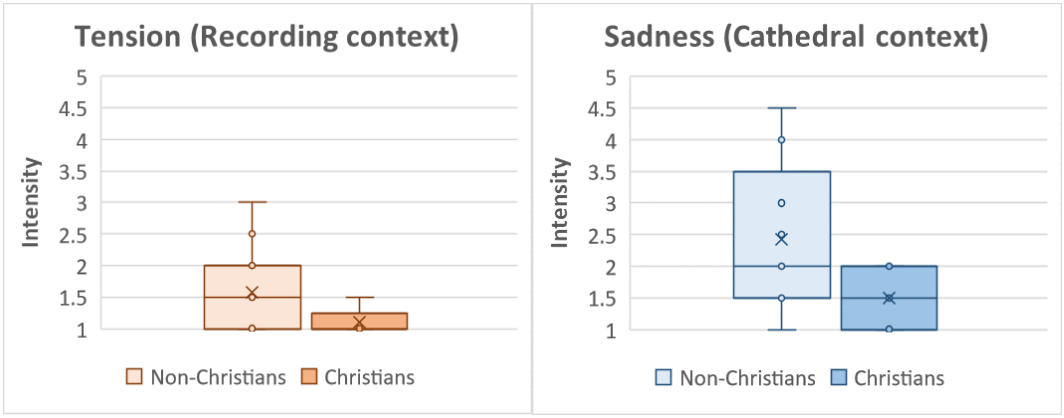

Figure 4. Boxplots summarising Non-Christian and Christian participants' self-reported intensity levels of Tension (Recording context) and Sadness (Cathedral context). Mean values are indicated by the "×" symbol on the plots.

Explorations of felt emotions between participants with Chapel Choir experience and those without. Miller and Strongman (2002) suggested an association between Familiarity and felt emotions. Since participants who had sung in chapel choir before had statistically significant higher familiarity with the music stimuli than those who had not, the felt emotions and Enjoyment were also compared between these two groups. Participants who never sung in chapel choirs generally had higher ratings in felt emotions than those who had chapel choir experiences in both context (see full results of means in Appendix 2). No difference was found in Enjoyment between these two groups. T-tests revealed that in the Cathedral context, participants who never sung in chapel choir before (M = 3.33, SD = 0.71) experienced significantly higher intensity in Transcendence compared to those who had chapel choir experience (M = 2.67, SD = 0.47), where $t(14) = 2.35$, $p = .033$ (Figure 5).

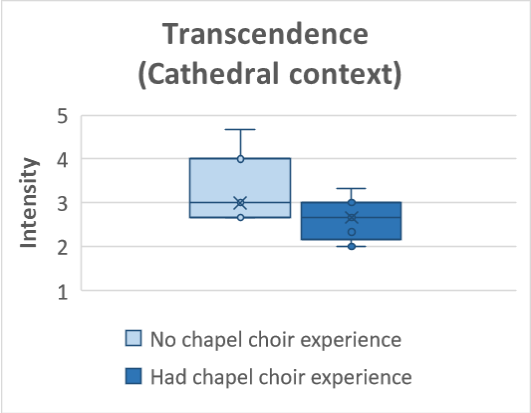

Figure 5. Boxplots summarising the intensity levels of Transcendence reported by participants who never sung in chapel choir before and those who had.

Thematic analysis of qualitative data. In the thematic analysis, Participants' descriptive responses were grouped into three main themes: felt emotions and intensity levels of the listening contexts, factors affecting the felt emotions, and other feelings different from the felt emotions (Table 3). Although this question did not ask the participants to draw on a particular listening context, most participants focused on the effects and feelings in the Cathedral context. The felt emotions of Transcendence, Wonder and Joyful Activation reported by the participants aligned with their statistical significance found in the quantitative analysis. Nevertheless, Power and Peacefulness which mentioned frequently by the participants did not show statistical significance in the quantitative analysis.

Table 3. Themes and codes of the open-ended question.

Themes (*n* of participants contributing)	**Codes** (*n* of participants contributing)
Felt emotions and intensity levels of Cathedral context (*n* = 11)	More Power (*n* = 5) More Transcendence (*n* = 4) More Peacefulness (*n* = 4) More Wonder (*n* = 2) More Joyful Activation (*n* = 1) More Sadness (*n* = 1) More Tenderness (*n* = 1)
Felt emotions and intensity levels of Recording context (*n* = 2)	More Tenderness (*n* = 1) More Wonder (*n* = 1) More Sadness (*n* = 1)
Factors affecting felt emotions (*n* = 10)	Listening to live music in the Cathedral (*n* = 5) Acoustic of the Cathedral (*n* = 4) Atmosphere of the Cathedral service (*n* = 4) Setting of Evensong (*n* = 2) The sound of organ (*n* = 1)
Other feelings (*n* = 8)	Cathedral context: • Engaging (*n* = 4) • Immersive (*n* = 3) • Focused (*n* = 2) • Appreciation of the music (*n* = 1) Recording context: • Reflecting (*n* = 1)

The live music listening experience, the acoustics of the Cathedral, and the atmosphere of the Cathedral service were the most common factors reported by participants which affected their felt emotions. While the acoustics of the Cathedral is a tangible feature of the space, the atmosphere is intangible, referring to the setting of the Evensong, and the religious, transcendental connotations of the Cathedral. Some participants directly commented on the impact of specific factors on specific emotions and feelings, which are displayed in Figure 6. Apart from emotions, several participants also mentioned other feelings, in which feeling engaged and immersive in the Cathedral were common.

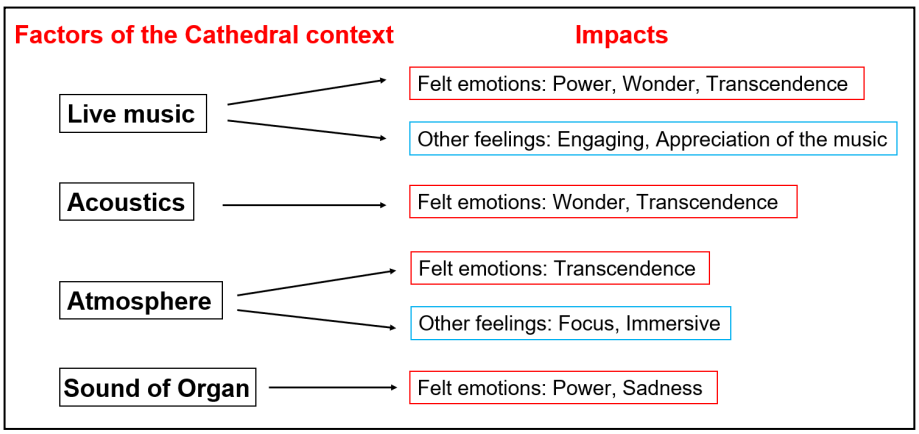

Figure 6. Chart demonstrating the impact of specific factors of the Cathedral context on felt emotions and other feelings, summarised from participants' responses.

4. DISCUSSION

Impact of listening contexts on felt emotions (H1). The result of this study supports the first hypothesis, which predicted that listening contexts could affect the felt emotions, that the church listening context can evoke stronger felt emotions. Quantitative analysis of GEMS-25 (Zentner et al., 2008) indicated that the mean intensity levels of all 9 musical emotions were higher in the Cathedral context than the recording context, and Wonder, Transcendence, Joyful Activation and Tenderness showed a statistical significance. The enjoyment of music was also significantly higher in the Cathedral context. Thematic analysis on participants' descriptive responses identified possible factors such as the live music, acoustics, atmosphere that affected the felt emotions and their intensities.

The participants' descriptive responses on the impact of acoustics on emotions, as well as the apparently higher intensity levels of perceived emotions in the Cathedral context, accorded with the findings of Algargoosh et al. (2022), who found that wet recordings elicited stronger emotional reactions. Considering the impact of social contexts, the participants listened to the worship music individually in the Recording context, while the Cathedral context was group listening which triggered stronger emotional responses. Although other factors in the listening contexts also affected the felt emotions, some participants commented that sitting with other people in the Evensong helped them to concentrate on experiencing and appreciating the music, where they enjoyed the music much more than solitary listening. These findings differ from the results of experimental settings in Egermann et al. (2011), where no differences in emotions were found between solitary and group listening. Thus, the emotional effects of solitary and group listening may subject to the music genre and settings, which require future investigation.

There are some differences between the results of GEMS-25 and participants' descriptive responses. Despite the four statistically significant emotions were included in participants' responses, Power, which was the most frequent emotion mentioned by participants, showed no statistical significance when compared between the listening contexts. One explanation is that the variation on the ratings of Power within the Cathedral context was greater than between the two contexts. It was possible that a few participants had stronger perceptions in Power in the Cathedral context and made comments in the open-ended question, but the rest of the participants were less responsive to Power. Participants' responses to the open-ended question reflected the most important emotions and factors to each individual, whereas GEMS assessed all emotional categories in a comprehensive way. Therefore, participants' own characteristics might play a role in feeling Power in different listening contexts, which can be further explored.

Comparisons on felt emotions between Christians and non-Christians (H2). The second hypothesis predicted that Christian participants would demonstrate stronger emotional responses to the worship music than non-Christians, based on Miller and Strongman's (2002) study. However, the results of this study did not firmly support this hypothesis. In both contexts, Christian participants rated higher in the emotion categories of Tenderness and Peacefulness, but these were not statistically significant. Although similar to Miller and Strongman's (2002) finding that Christians enjoyed the music more in the Recording context, there was little differences in Enjoyment between the two groups in the Cathedral context. Unexpectedly, t-tests showed that Tension in the Recording context and Sadness in the Cathedral context had statistical significance, where the non-Christians perceived higher intensity levels.

These results can be interpreted in different ways. Primarily, Miller and Strongman (2002) have noticed the association between familiarity with the worship music and the stronger emotional responses. In this study, only 5 Christians were recruited, and only 3 attended churches on regular basis. Since these Christian participants did not have an obvious advantage on familiarity to the music compared to non-Christians, the results were not representative to the general Christians. Secondly, due to the large number of statistical tests performed to compare the emotions, the chances of obtaining false-positive results increased (Bonferroni, 1936). As a result, Tension and Sadness might have appeared to be statistically significant by chance. Lastly, all participants recruited in Miller and Strongman (2002) were from New Zealand with similar cultural background. Nonetheless, in this study, both Christian and non-Christian participants were from diverse cultural backgrounds. Since felt emotions of music can be subjective to culture (Argstatter, 2015), the influence of cultural backgrounds might be even greater than religious beliefs in this study.

Familiarity with the music and felt emotions. Due to the uncertainties on cultural backgrounds and small sample size of the Christian group, this study took an alternative approach on familiarity with worship music by assessing participants with their chapel choir experience. Participants who sung in chapel choirs before had statistically significant higher familiarity with both church music and the music stimuli. Unexpectedly, most of the felt

emotions were rated higher by participants who never sung in chapel choir before, and Transcendence in the Cathedral context were perceived significantly higher by participants with no chapel choir experience, contradicting the positive relationships between familiarity of music and acoustic space, and between familiarity and emotional responses in previous research (Algargoosh et al., 2022; Miller & Strongman, 2002). For participants who were less familiar with church music, the novelty of this music genre and the Cathedral Evensong service might have triggered a stronger emotional response. Furthermore, the participants with chapel choir experience indicated a noticeable increase in their familiarity with the music stimuli in the Cathedral context than the Recording context. This implies that the familiarity with worship music might relate to the religious setting, which can be explored in the future.

Limitations and improvements. This study has several limitations. Firstly, due to practical and time constraints, the total sample size was small, especially with a limited number of Christian participants. The participants also had a diverse cultural background which might bring differences in the perceptions of musical emotions (Argstatter, 2015). Considering the small sample size and possible effects of cultural backgrounds, the results from comparisons of felt emotions between Christian and non-Christian participants were less conclusive and should be viewed as exploratory. A larger and more balanced sample size would help to improve the statistical power. Secondly, felt emotions were measured by GEMS-25, which emphasis on music emotions and is retrospective. Thus, religious emotions and the continuity or changes of emotions throughout the music listening were not addressed. To improve this limitation, the future study can adopt qualitative approaches such as interviews and focus groups to better understand religious emotions of the Christian participants, and considering using psychophysiological measurements to track the continuous responses. Moreover, only two pieces of choral worship music were used, which could not represent all Christian worship music. Since participants have commented on the effect of organ sounds in bringing sadness and power in the Cathedral context, investigating the emotions of Christian instrumental music would be a possible interest for future studies.

Conclusion and implications. To summarise, the results of this study support the first hypothesis that listening contexts, including characteristics such as live music, acoustics, and atmosphere, can influence felt emotions of Christian worship music. The Cathedral Evensong listening contexts indicated a statistically significant stronger responses in Wonder, Transcendence, Tenderness, Joyful Activation and Enjoyment. The results, however, were not consistent with the second hypothesis, which predicted a higher intensity level of emotions perceived by Christian participants. The higher intensity of sadness and tension experienced by non-Christians were unexpected. In addition, participants who never sung in chapel choir and unfamiliar to church music demonstrated stronger emotional responses in both contexts, which was opposite to previous research. Despite this, the association between religious belief and felt emotions of worship music remains inconclusive due to the small sample size and the impacts of cultural backgrounds and individual characteristics, which can be better studied in future research with improved methodologies. For the implications, the findings of this study demonstrated that listening to worship music in a religious context is vital in evoking stronger felt emotions and enjoyments, and is more appealing to non-believers. As supported by Myrick (2021), the positive impact of the religious listening context can facilitate emotional relationships, thus contributing to the formation of healthy religious communities.

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APPENDICES

Appendix 1. The means (*SD* in brackets) of the 9 musical emotions and Enjoyment of the piece of Christian and Non-Christian participants

Musical Emotion Category	**Recording Context**		**Cathedral Context**	
	Christians Mean	**Non-Christians Mean**	**Christians Mean**	**Non-Christians Mean**
Wonder	2.6 (0.72)	2.62 (0.78)	3.13 (0.56)	3.13 (0.90)
Transcendence	2.53 (0.38)	2.51 (0.77)	3.13 (0.73)	2.67 (0.41)
Power	1.80 (0.61)	2.10 (0.76)	1.93 (0.69)	2.46 (1.10)
Tenderness	3.53 (0.65)	3.13 (0.99)	3.8 (0.38)	3.37 (1.08)
Nostalgia	2.93 (1.01)	3.18 (0.93)	3.53 (0.45)	3.23 (1.00)
Peacefulness	4.20 (0.30)	3.79 (0.80)	4.4 (0.37)	3.90 (1.05)
Joyful Activation	1.67 (0.33)	1.92 (0.81)	1.93 (0.64)	2.26 (0.98)
Sadness	1.60 (0.89)	1.96 (0.95)	1.50 (0.50)	2.42 (1.17)
Tension	1.10 (0.22)	1.58 (0.64)	1.20 (0.45)	1.85 (1.03)
Enjoyment	4.00 (0.71)	3.54 (1.45)	4.20 (0.45)	4.23 (0.73)

Appendix 2. The means (*SD* in brackets) of the 9 musical emotions and Enjoyment of the piece of participants with/without chapel choir experience

Musical Emotion Category	**Recording Context**		**Cathedral Context**	
	With Chapel Choir Experience Mean	**Without Chapel Choir Experience Mean**	**With Chapel Choir Experience Mean**	**Without Chapel Choir Experience Mean**
Wonder	2.55 (0.69)	2.67 (0.83)	2.85 (0.78)	3.41 (0.76)
Transcendence	2.22 (0.53)	2.81 (0.71)	2.67 (0.47)	3.33 (0.71)
Power	1.85 (0.60)	2.19 (0.82)	2.00 (0.91)	2.63 (1.06)
Tenderness	3.26 (0.88)	3.22 (0.99)	3.30 (1.05)	3.59 (0.88)
Nostalgia	2.96 (0.80)	3.26 (1.08)	3.04 (0.70)	3.60 (1.00)
Peacefulness	3.81 (0.71)	4.00 (0.75)	3.89 (1.17)	4.19 (0.65)
Joyful Activation	1.70 (0.54)	2.00 (0.85)	2.07 (0.78)	2.26 (1.04)
Sadness	1.67 (0.61)	2.06 (1.16)	1.94 (0.98)	2.39 (1.22)
Tension	1.61 (0.74)	1.28 (0.36)	1.56 (0.85)	1.78 (1.07)
Enjoyment	3.67 (1.22)	3.67 (1.41)	4.11 (0.60)	4.33 (0.71)