RESEARCH ARTICLE

# REVISED Music across the love-span: a mixed methods study into the use of music in romantic relationships

[version 2; peer review: 1 approved, 3 approved with reservations]

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## Abstract

### Background

Music is known to be a powerful tool for social bonding, but its role in romantic relationships remains poorly understood. The present study explored the perceived relevance of music to three core aspects of love (intimacy, passion and commitment) across three relationship stages: attraction, building, and maintenance.

### Methods

Using a mixed-methods approach, 174 participants (83% female, 14% male, 3% other) responded to self-report ratings assessing the role of music for the three aspects of love across the three relationship stages, as well as open-ended questions reflecting on their music-related experiences at each relationship stage.

### Results

Results from quantitative ratings showed that music promotes intimacy and passion, particularly during the attraction and building phases, with less impact on commitment and during the maintenance phase. Participants with greater musical expertise and sensitivity to music-related reward rated music as more important overall and as contributing more strongly to aspects of love, with this pattern

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remaining consistent across relationship phases and aspects of love. This suggests that musical ability and preference may be used across relationship stages as tools to assess compatibility between partners, rather than being generally attractive traits. Qualitative analysis of 351 coded open responses revealed a set of 55 key musical actions (e.g., listening, sharing and making music) and outcomes (e.g., bonding, (re)connecting and assessing compatibility) related to participants' use of music throughout the three relationship stages. Themes such as signalling attraction and emotional communication were most prominent in the attraction phase, whereas bonding through shared musical activities was more common in later phases.

**Conclusion**

The present study provides a first systematic investigation of the role of music for different phases and aspects of romantic relationships. The findings provide valuable insights for music research, relationship studies, and therapeutic practice, highlighting the role of music in fostering connection and intimacy in romantic relationships.

## Plain language summary

Music plays an important role in relationships, especially in the early stages of getting to know someone and building a connection. It can help people express identity, share emotions and bond through shared experiences. But how does music contribute to romantic love at different stages of a relationship, namely initial attraction, building a relationship and maintaining it over time?

This study asked people to rate how important music was at different stages of a relationship, and about the ways they used music in their relationships. It was found that music is most important for fostering intimacy and passion in the early stages, but has less impact on commitment in long-term relationships. People with greater musical ability or enjoyment of music valued it more in their relationships, suggesting that music may signal compatibility rather than simply attractiveness. Participants' personal stories revealed that music-related activities, such as listening to, sharing or creating music together, helped couples to connect and communicate. For example, in the attraction phase, music is often used to signal compatibility or express feelings, while in later phases can be used to bond through shared activities.

This research highlights the power of music in romantic relationships and offers new insights into how couples use music to foster connection and intimacy throughout their shared journey.

## Keywords

Music, romantic relationships, social bonding, mate selection, compatibility, attractiveness

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**REVISED** **Amendments from Version 1**

In this revised version of the article, we have tried to integrate all the suggestions of the reviewers and make additional minor stylistic improvements throughout the text. The main changes are as follows:

- Introduction: We have clarified the rationale behind Research Question 2 (RQ2) and expanded the theoretical background to explain why the study of music and bonding in romantic relationships is particularly interesting from an evolutionary perspective.

- Methods: We added a table listing all self-generated questions (Table 1), and expanded he descriptions of the sample and the questionnaires used.

- Quantitative results: Given the ordinal nature of most variables, we now report Spearman correlations and have applied Benjamini–Hochberg correction to all correlational analyses. Additionally, we conducted a new analysis comparing participants with low versus high BMRQ (music-related reward sensitivity) scores, as suggested by Reviewer 2. This analysis examined the main effects and interaction effects regarding the perceived role of music overall and across the three aspects and phases of romantic relationships (Table 2).

- Qualitative results: Instead of percentages based on all identified codes, we now report the percentage of participants mentioning each code, theme or aggregate dimension. The theme 'Memories' has been renamed 'Making and recalling memories', and all figures have been updated accordingly. We also added a subsection detailing the frequency and content of negative experiences with music, and we moved Figure 4, which was previously in the supplementary material, into the main text.

- Discussion: We included percentages when summarising first-order codes to provide more detailed descriptions. Several paragraphs, particularly those addressing RQ2, were rephrased for greater clarity and precision as suggested by Reviewer 2. The limitations section was also expanded based on feedback from both reviewers.

**Any further responses from the reviewers can be found at the end of the article**

## Introduction

Music plays an important role in everyday life and serves not only personal purposes (e.g. mood regulation, evoking positive memories or helping with event processing), but also social functions (e.g., Dingle *et al*., 2021; Tarr *et al*., 2014). For example, musical preferences are among the most frequent topics of conversation when strangers initiate relationships (Rentfrow & Gosling, 2006), and social bonding was found to develop more rapidly in singing groups than in those engaged in crafts or creative writing (Pearce *et al*., 2015). While most research to date has concentrated on music's social functions in contexts involving strangers or friends, a recent comprehensive theoretical review by Bamford *et al*. (2024) explored the potential role of music in the specific case of romantic relationships, addressing mate selection and social bonding functions of musical experiences over different relationship stages. Building on this work, the aim of the present study was to explore the role of music at different stages of romantic relationships and to examine which musical activities and their outcomes influence partner choice and facilitate or inhibit romantic feelings.

### Aspects of romantic love

Romantic love has been widely portrayed in literature, film and music, leading to a common understanding of the concept despite different definitions. Key elements include longing for an enduring bond with a specific individual (Hatfield & Rapson, 1993), strong emotional attachment combined with sexual desire (Goode, 1959), and interdependence, in which partners influence each other's behaviours and decisions (Bradbury & Karney, 2019). A prominent research framework is Sternberg's (1986) Triangular Theory of love, which identifies three key components: intimacy, passion, and commitment. Different levels of these components differentiate different forms of love, ranging from non-love (absence of all components) to consummate love (strong presence of all three components).

Within this framework, *intimacy* represents the 'warm' components of love, involving mutual interactions and self-disclosure, deep affective feelings, and an inclination towards and pursuit of closeness (Sternberg, 1986). *Passion* embodies the 'hot' component of love and includes cognitive (e.g., persistent thoughts), affective (e.g., sexual attraction and intense emotions), and behavioural (e.g., seeking physical closeness) aspects (Hatfield & Sprecher, 1986; Sternberg, 1986). The third component, *commitment*, is the 'cold' component of love, involving the decision to enter into and maintain a long-term relationship and behaviours aimed at achieving this goal, such as devaluing alternatives, making sacrifices for the partner, and accommodating negative partner behaviour (Sternberg, 1986).

The triangle theory of love has significantly influenced subsequent theories of romantic love, has been empirically validated (e.g., Acker & Davis, 1992; Lemieux & Hale, 2002), and shows potential universality across cultures (Sorokowski *et al*., 2021).

### Romantic relationship stages

According to Levinger's (1980) concept of long-term relationships, as adopted in the theoretical framework of Bamford *et al*. (2024), three primary stages of romantic relationships can be distinguished: attraction, relationship building and, if there is no deterioration or termination, a maintenance phase. These stages align well with other influential models of relationship development, such as the Staircase Model (Knapp, 1978), Social Penetration Theory (Altman & Taylor, 1973), and Uncertainty Reduction Theory (Berger & Calabrese, 1975).

During the *attraction stage*, potential partners get to know each other, leading to emotional and cognitive evaluations of each other. The emergence of attraction is influenced by a variety of internal and external factors, including personality traits, values, physical appearance, mutual liking, and perceived similarities in personality, values, and attitudes (e.g., Buss & Barnes, 1986; Luo, 2017; Montoya & Horton, 2020). Communication at this stage is typically superficial and guided by social norms, with limited personal disclosure (e.g., Berger & Calabrese, 1975; Knapp, 1978)

The phase of *building a relationship* is characterised by a rapid increase in self-disclosure, allowing for deeper communication

and the sharing of personal opinions and attitudes (e.g. Altman & Taylor, 1973). As communication intensifies and bonds strengthen, partners may form a relational identity, make the relationship public, or take significant steps such as marriage (Knapp, 1978).

Once partners define themselves as couples or romantic partners, the relationship process continues into the *maintenance phase*. Individual strategies for maintaining the relationship may include positive illusions, idealisation, and expressions of gratitude, while interactive strategies include effective communication, conflict management, dyadic coping, mutual support, humour, and engaging in joint activities (Ogolsky *et al*., 2017).

The relative importance and prominence of the three components of the triangle of love - intimacy, passion, and commitment - changes at different stages of a relationship. The attraction phase (which typically lasts up to six months) is characterised by a rapid increase in passion for a potential partner. As the relationship moves into the building phase, and for about the first four years, couples experience increased intimacy, with a slight decrease in passion. Beyond this period, commitment becomes more central, with intimacy remaining at medium to high levels, while passion continues to decline (Acker & Davis, 1992; García, 1998; Wojciszke, 2002).

## Music for mate choice and social bonding

The potential for music to foster social connection has been widely studied; however, most studies focussed on groups of strangers or friends, but not couples. For example, musical preferences are important expressions of identity (e.g., Shepherd & Sigg, 2015) and are often used to initiate conversations with strangers (Rentfrow & Gosling, 2006). Having similar tastes can strengthen in-group bonds and encourage the development of friendships (Lonsdale & North, 2009; Selfhout *et al*., 2009). Singing together elicits sociobiological bonding responses (Bowling *et al*., 2022; Kreutz, 2014), and compared to groups engaged in other activities, singing has been shown to be associated with accelerated bonding processes (Pearce *et al*., 2015). Collective musical activities, such as drumming and improvisation, were further associated with prosocial behaviour, feelings of belonging, and commitment (Kokal *et al*., 2011; Kokotsaki & Hallam, 2007; Verneert *et al*., 2021). These effects are often attributed to synchrony, as interpersonal temporal coordination of actions commonly leads to increased feelings of social affiliation, trust, and prosocial behaviour (Bamford *et al*., 2023; Hove & Risen, 2009; Mogan *et al*., 2017; Rennung & Göritz, 2016; Vicaria & Dickens, 2016). Music provides a temporal scaffolding that makes it easier to coordinate actions in time (Tarr, 2017), while also creating a social space that aligns the intentions and emotions of participants (Cross, 2014). These mechanisms can be understood through the Access-Awareness-Agency model of music-based social-emotional competence. This model posits that the capacity of music to allow such non-verbal, embodied access to emotional and shared experiences is a fundamental building block for the development of social-emotional competence (Saarikallio, 2019).

However, while there is substantial research on the capacity of music to foster bonding between groups or strangers, there is little work specifically looking at how music-related experiences might influence partner choice or enhance feelings of intimacy, passion, or commitment in romantic relationships. Exploring these questions is particularly interesting from an evolutionary perspective, given that the evolutionary function of music has been linked not only to social bonding and coalition signalling in groups (Mehr *et al*., 2021; Savage *et al*., 2021), but also to the mating context. Specifically, it has been suggested that music serves to attract potential partners by signalling fitness or compatibility (e.g., Miller, 2000). In many species, including birds and gibbons, vocalisations and musical displays are associated with pair bonding (e.g., Fitch, 2005; Geissmann, 2000). This supports the theory that music evolved, at least in part, through sexual selection.

Some research has already shown that musical traits - such as being a musician, improvisational skills, or dance ability – are perceived as attractive (Hagen & Bryant, 2003; Madison *et al*., 2018; Marin & Rathgeber, 2022), consistent with evidence that creativity is generally considered attractive in mate choice (e.g., Karamihalev, 2013). However, other studies have found no significant associations between musical ability and mating success (Mosing *et al*., 2015) or reported such effects only among highly musical individuals (Bongard *et al*., 2019).

Beyond its role in attracting potential partners, a prominent example of music in romantic contexts is the 'couple-defining song'. Harris *et al*. (2020) found that 60% of 200 U.S. participants reported having songs they associate with their romantic relationships, which were associated with greater intimacy, a stronger sense of "we", and the retrieval of positive shared memories.

In terms of relationship maintenance, couples often report engaging in musical activities together (Campbell *et al*., 2011). However, to the best of our knowledge, only one study has specifically examined the effects of engaging in dyadic musical activities, such as listening to music together, sharing and exploring music, or making music as a couple. This study found that even when controlling for other non-musical dyadic activities, couples who engaged in dyadic musical activities (as opposed to structured group activities with others) experienced higher levels of commitment, mediated by interpersonal coordination and self-disclosure (Harwood & Wallace, 2021). Notably, two thirds of the dyads in the study were non-musicians, suggesting that the positive effects of engaging in musical activities are not solely dependent on both partners being musically inclined.

Overall, research on how music affects different aspects of romantic love at different stages of relationships is limited. Apart from one study examining the impact of shared musical activities on commitment (Harwood & Wallace, 2021), little research has been conducted into how music influences intimacy or passion. It remains unclear how couples use music in their

relationships, whether and how these actions influence love-related outcomes, and which individuals are more or less influenced by music during the development and maintenance of romantic feelings.

### The present study: Aims and research questions

The present study aimed to empirically test the role of music in romantic relationships as proposed by Bamford *et al.* (2024). We used a mixed-methods design that employed both quantitative and qualitative questions. This combinations allows us to explore the nuances of participants' experiences with music in relationships, potentially uncovering themes and patterns that may not emerge from quantitative measures alone. The following three research questions guided this study:

*RQ1*: How important is music in the context of romantic relationships, and does it contribute to strengthening intimacy, passion, and commitment at different stages of romantic relationships?

According to the model outlined by Bamford *et al.* (2024), we expect that the role of music for passion should be most important in the attraction phase, intimacy to be most important in the building phase, and commitment to be most important in the maintenance phase. However, these predictions are based on limited prior research.

*RQ2*: Does the perceived importance of music in romantic relationships, both overall and in contributing to specific aspects of love (passion, intimacy, commitment), vary with individual differences in musical expertise and sensitivity to musical reward?

Two contrasting hypotheses can be considered. On the one hand, people often seek similarity in romantic partners (Luo, 2017), so musical expertise and sensitivity to music-related reward may correlate with the perceived importance of music in romantic relationships overall, as well as in different aspects of love. On the other hand, musicality may be generally attractive because it signals overall fitness (Miller, 1999), implying that music should be equally important to everyone. Examining these associations could help to clarify whether the role and potential benefits of music in romantic relationships are universal, or whether they are primarily characteristic of individuals with higher musicality.

*RQ3*: What is the nature of music-related experiences that individuals recall in the context of romantic relationships across three relationship phases?

While RQ1 and RQ2 will be addressed with quantitative data, RQ3 is purely exploratory and will be analysed qualitatively with data-driven template analysis using participants' open responses.

## Methods

### Participants

A total of 174 individuals (out of 402 individuals that visited or started the survey) completed all parts of the study (145 females, 25 males, 3 non-binary, 1 other), with a mean age of 27.18 years ($SD$ = 9.27, range = 18–63). Most participants reported Finland ($n$ = 49), Austria ($n$ = 40), and Germany ($n$ = 38) as their nationalities; the other nationalities reported by more than one participant were Italy (18), the United Kingdom (4), and Australia (4). In terms of education, 56% held a university degree, 34% a high school diploma, 9% vocational training (9%), and 1% compulsory education.

Regarding musical background, the sample was quite diverse. Slightly more than half of the participants identified themselves as non-musicians (57%), while 35% described themselves as amateurs or serious amateur musicians, and 8% as (semi-)professional musicians. At the same time, 61% of the sample play an instrument or sing (97% of amateur and (semi)professional musicians; 34% of non-musicians). Of these musically active participants, they sing/play already for an average of 15.80 years ($SD$ = 11.20, range = 0–55) and about 3.41 hours per week ($SD$ = 4.40, range = 0–24).

Most participants were in a romantic relationship at the time of participation ($n$ = 118, 68%); 36 (21%) were single, and the remaining 20 (11%) were in the dating stage. Of the participants who were not single ($n$ = 13), 116 (84%) were in the maintenance phase of a relationship, 13 (9%) were in the building phase, and 9 (7%) were in the initial attraction phase. Participants in romantic relationships had been together with their partner for a mean of 5.28 years ($SD$ = 2.38, range = 0.08 - 40.42).

### Procedure

The study was conducted as an online survey using the open access software LimeSurvey (Limesurvey GmbH, 2022). Participants were recruited through email invitations sent to all students at the University of Innsbruck (Austria) and the University of Jyväskylä (Finland). In addition, the study invitation was shared on social media platforms, including Facebook and Instagram. The only inclusion criterion was that participants had to have experienced at least one romantic relationship of any kind (e.g. monogamous, polyamorous, open, heterosexual, homosexual or bisexual) at some point in their lives. After giving informed consent and completing demographic questions, participants were presented with explanations of the three relationship phases (attraction, building and maintenance) and aspects of love (intimacy, passion, and commitment). They were then asked to provide information about their experiences with music in the context of romantic relationships, answering quantitative and qualitative questions separately for each phase. Finally, participants provided information about their musical background, current relationship status, sensitivity to musical reward, and answered additional questions about

the importance of music in the context of love. The survey was distributed on 12 pages with approximately 3–10 questions per page. The data collection took place between November 2023 and February 2024.

## Quantitative measures

Participants could complete the survey in either English or German. The exact wording of all questions and answer labels is available in the OSF repository (in the quantitative data section). Item wordings are presented in English, and German versions are available upon request.

*Role of music in romantic relationships*. Separately for each of the relationship phases (attraction, building, maintenance), participants rated the overall importance of music and how much they feel music contributed to strengthening the three components of the Triangle Theory of Love (Sternberg, 1986), namely passion, intimacy, and commitment (see Table 1 for exact question wordings and answer labels). At the end of the survey, they answered a few more questions about the integration of music in their relationships (all on a 5-point scale; 1 = *No, not at all*, 5 = *Yes, totally*): If they talk about music with (potential) partners, if a (potential) partner's musical taste and musical ability is important to them, if they ever had a song that represented the relationship ("our song"), and if they think musical compatibility is more important than compatibility in other areas of leisure.

*Musical Expertise*. To assess participants' musical background, we used a single item from the *Ollen Musical Sophistication Index* (Ollen, 2006) on self-reported musical status (1 = *non-musician*, 2 = *music-loving non-musician*, 3 = *amateur musician*, 4 = *serious amateur musician*, 5 = *semi-professional musician*, 6 = *professional musician*), supplemented by self-generated questions on whether they played an instrument or sang, for how many years, and how many hours per week they practised. To adjust for age differences, we re-coded years of practice to indicate the percentage of life spent playing an instrument or singing (years of practice/age). As the four items (self-reported musical status, whether or not they play an instrument/sing, years of playing/singing, weekly practice hours) were internally consistent (Cronbach's Alpha = 0.86), they were z-transformed and combined into a continuous composite score for musical expertise.

*Sensitivity to Musical Reward*. Sensitivity to musical reward experiences was assessed using the *Barcelona Music Reward Questionnaire* (BMRQ; Mas-Herrero *et al.*, 2013). It assesses different facets of music reward and had high internal consistency in our sample: music-seeking (α = 0.61; e.g., "*I inform myself about music I like*"), emotion evocation (α = 0.63; e.g., "*I sometimes feel chills when I hear a melody that I like*"), mood regulation (α = 0.70; e.g., "*Music calms and relaxes me*"), sensory motor (α = 0.73; e.g., "*Music often makes me dance*"), social reward (α = 0.54; e.g., "*Music makes me bond with other people*"), and an overall musical reward score (α = 0.82). All items were measured on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). As we are not aware of a validated German version of the BMRQ, three bilingual translators independently translated the scale into German and selected the best translations for all items.

*Demographic and relationship questions.* We further asked about age, gender (1 = *female*, 2 = *male*, 3 = *non-binary*, 4 = *other*), education (1 = *compulsory school without vocational training*, 2 = *compulsory school with vocational training*, 3 = *vocational school with A-levels/high-school diploma*, 4 = *academic high school/grammar school*, 5 = *Bachelor's degree*, 6 = *Master's degree*, 8 = *Doctorate/PhD degree*), and nationality. Furthermore, we assessed whether participants were in a romantic relationship, and, if so, at what stage (attraction, building, or maintenance) and for how many years.

## Qualitative measures

For each of the three relationship phases (attraction, building, and maintenance), we provided participants with an empty

**Table 1. Self-generated questions regarding the role of music in romantic relationships.**

| Construct | Question text | Answer format |
|---|---|---|
| Overall role of music | At this stage of the relationship, is/was music important to you? | 1 = No, not at all; 5 = Yes, totally |
| Music strengthening passion | At this stage of the relationship, did music contribute to strengthening the passion you feel towards each other? | 1 = No, not at all; 5 = Yes, totally |
| Music strengthening intimacy | At this stage of the relationship, did music help you to feel more connected to each other? | 1 = No, not at all; 5 = Yes, totally |
| Music strengthening commitment | At this stage of the relationship, did music contribute to the decision to continue the relationship with this person? | 1 = No, not at all; 5 = Yes, totally |

*Note*: Participants answered each question three times, once for each of the three relationship phases (attraction, building and maintenance).

text box to list their experiences with music that were relevant to their romantic relationships at that stage. The wording was:

*"Please list any experiences with music that have been relevant to the relationship during the phase of [attraction/building/maintaining] a relationship. These can be positive activities that have strengthened the relationship, or negative experiences that have contributed to drifting apart".*

### Data analysis

All analyses were conducted using R Studio (version 2025.05.0), and both the data and the analysis code are available in the OSF repository.

***Quantitative analysis.*** We conducted quantitative analyses to address the first two research questions concerning participants' perceptions of the role of music in romantic relationships and its association with personal characteristics. Two repeated measures ANOVAs assessed whether the importance of music overall and in strengthening different components of love varied across relationship stages or love aspects. We tested the sphericity assumption using Mauchly's test and, where violated, applied Greenhouse-Geisser corrections (evident from decimal degrees of freedom). The first analysis predicted the perceived positive contributions of music based on aspects of love (intimacy, passion, commitment; see Table 1 for item wordings), different relationship stages (attraction, building, maintaining), and their interactions. The second analysis predicted the overall role of music (see Table 1 for question wording) based on the relationship stage. To explore associations between music-related individual characteristics and the perceived role of music for romantic relationships, overall and for specific aspects of love, we ran additional correlation analyses. Given that most variables were measured on ordinal scales, Spearman's rank-order correlations were used. To account for multiple testing, the Benjamini-Hochberg procedure was used to correct the p-values, controlling the false discovery rate at 0.05. For the correlational analysis involving gender, participants identifying as non-binary or other genders ($n$ = 4) were excluded. For all other analyses, we relied on the complete dataset.

***Qualitative analysis.*** We used template analysis (Brooks *et al.*, 2015; Crabtree & Miller, 1992) to analyse participants' responses to three open-ended survey questions about their experiences of music in romantic relationships. Following the methodology outlined by Brooks *et al.* (2015), we first created a collaborative template among all authors. The template for the current analysis was inductively defined based on empirical observations from the initial screening of responses. The initial template delineated two main categories: 'action', which included activities such as making, sharing and listening to music, and 'outcome', which included signalling attraction or compatibility, bonding and regulating emotions and affect. Once a basic code structure was established, two authors independently and parallelly coded all responses, meeting periodically to refine or expand the template, as needed. Each response could be assigned multiple codes, but each code was counted only once per response in order to avoid overrepresenting participants who provided more detailed answers. Ultimately, we arrived at a final set of 55 codes organised into four second-level categories for action and five for outcome. An overview of the codes, higher-order themes, and dimensions identified is shown in Figure 2, and Table S3 (see OSF repository) provides the descriptions of all codes. Inter-rater agreement was assessed using Cohen's kappa coefficient (McHugh, 2012).

## Results

### Quantitative results

To address RQ1, we conducted a repeated-measures ANOVA to examine the perceived importance of music, with aspect of love (intimacy, passion, commitment) and relationship phase (attraction, building, maintenance) as within-subject factors. This analysis revealed significant main effects for both aspect, $F(1.39, 240) = 195.75$, $p < .001$, $\eta p^2 = 0.53$, and phase, $F(1.62, 280) = 13.44$, $p < .001$, $\eta p^2 = 0.07$, and no interaction effect, $F(3.56, 616) = 0.87$, $p = .475$, $\eta p^2 = 0.01$. Pairwise comparisons using Bonferroni correction indicated significant differences between all relationship aspects ($p < .001$). Regarding relationship phases, there were no differences between the attraction and building phases ($p = 1.00$), but there were differences between the maintenance phase and both the attraction and building phases ($ps < .001$). In a second ANOVA, the perceived general role of music did not differ across relationship phases, $F(1.85, 319.2) = 0.77$, $p = .462$, $\eta p^2 < 0.01$. As shown in Figure 1, participants reported a high general role of music in all three phases ($M = 4.00$, $SD = 0.89$). The importance of music for the three components was higher in the attraction ($M = 3.61$, $SD = 1.08$) and building ($M = 3.59$, $SD = 1.02$) phases than in the maintenance phase ($M = 3.31$, $SD = 1.05$), while it appeared to be most important for intimacy ($M = 3.96$, $SD = 0.97$), followed by passion ($M = 3.76$, $SD = 0.99$), and commitment ($M = 2.79$, $SD = 1.18$).

To explore whether music-related individual traits moderate role of music in romantic relationships (RQ2), we correlated musical expertise and sensitivity to music-related reward with the perceived overall role of music and its contribution to strengthening the three aspects of love (aggregated across phases). As an exploratory analysis, we also included demographics (gender, age, and education) in the correlation analysis. As detailed in Table 2, sensitivity to musical reward was positively associated with all outcomes except commitment, whereas musical expertise correlated only with the overall role of music. Table S1 in the Extended Data (see OSF repository) shows the same correlations for all BMRQ subscales. The strongest correlations with the overall role of music and its contribution to the three aspects of love appear for the social reward subscale, while the weakest correlations appear for the sensory-motor subscale.

As the BMRQ showed moderate correlations with all outcomes, we conducted an additional analysis to examine whether music-related reward sensitivity influenced the importance people attach to music across different relationship phases and aspects of love. Specifically, we ran a repeated-measures ANOVA including the BMRQ group (low versus high, based

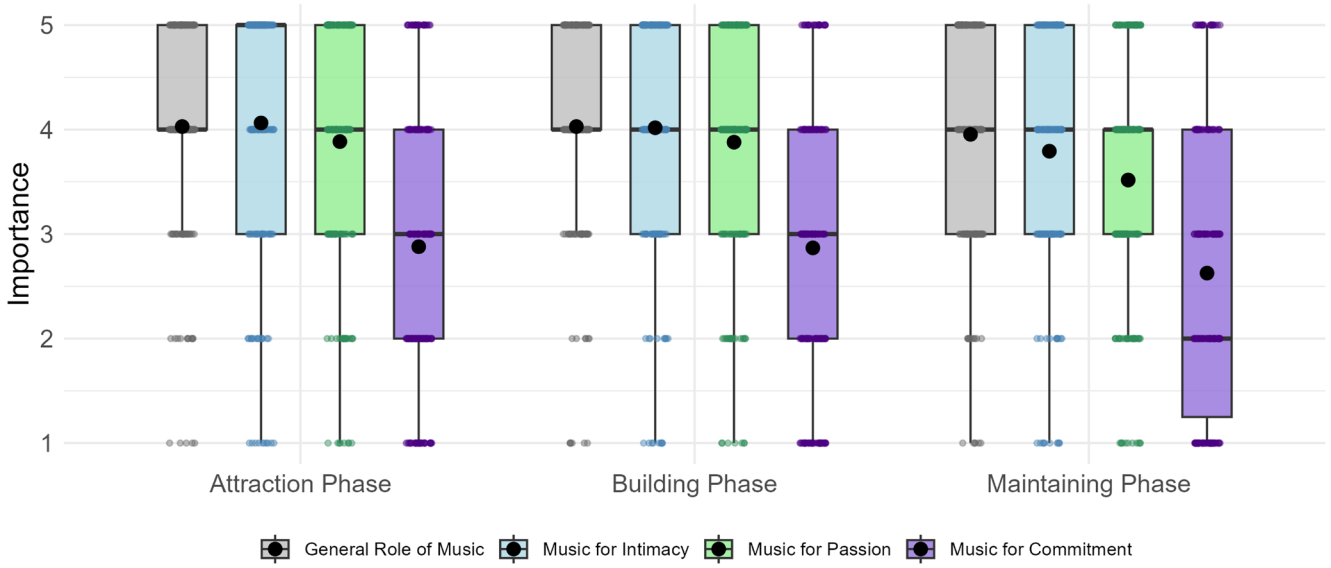


**Figure 1. The importance of music across the three phases of romantic relationships.** *Note.* Boxplots summarise the distribution of the data, while the responses of individual participants are shown as jittered points. Mean values are indicated by larger black circles. Questions regarding the general role of music, as well as its perceived contribution to strengthening the three aspects of love, were measured on a scale from 1 (*not at all*) to 5 (*totally*).

on a median split) as the between-subjects factor. The analysis revealed significant main effects of love aspect ($F(1.38, 238) = 197.17$ $p < .001$, $\eta p^2 = 0.53$) and phase ($F(1.62, 279) = 13.35$, $p < .001$, $\eta p^2 = 0.07$), as well as a main effect of BMRQ ($F(1.00, 172) = 23.21$, $p < .001$, $\eta p^2 = 0.12$). These results suggest that individuals with higher BMRQ scores consistently rated music as more important than those with lower scores, across all phases and love aspects. There were no significant interactions between BMRQ and phase ($F(1.62, 279) = 0.01$, $p = .991$, $\eta p^2 < 0.01$) or between BMRQ and aspect ($F(1.38, 238) = 1.76$, $p = .184$, $\eta p^2 = 0.01$). Thus, the relative pattern of music's contribution to different love aspects across phases was unaffected by BMRQ. Figure S1 in the Extended Data (OSF repository) illustrates these results, showing music importance across phases and love aspects separately for low and high BMRQ groups.

In response to additional 5-point scale questions, participants indicated that they typically discussed their musical preferences with their (potential) partners ($M = 4.28$, $SD = 0.86$) and placed moderate importance on their partner's musical taste ($M = 3.52$, $SD = 1.06$), but less importance on their partner's musical ability ($M = 2.19$, $SD = 1.14$). On average, participants tended to have songs that they considered defining their relationships with ($M = 3.70$, $SD = 1.37$). Overall, the participants did not perceive musical compatibility as more important than compatibility in other leisure activities ($M = 2.54$, $SD = 1.05$). Consistent with findings regarding the role of music in romantic relationships, musical expertise was positively correlated with talking about preferences and placing importance on a partners' musical ability, while musical reward was associated with all five additional questions (see Table S2 in the Extended Data (OSF repository) for more details).

## Qualitative results

Out of 174 participants, 147 answered at least one of the three open-ended questions. Responses were provided by129 participants for the attraction phase, 119 for the building phase, and 103 for the maintenance phase, resulting in a total of 351 coded responses. Qualitative template analysis, as described in the Methods section, yielded 55 distinct codes grouped into nine higher order themes (making and recalling memories, listening to music, sharing and discussing music, active musical activities, attraction, compatibility, self-disclosure and communication, bonding and (re)connecting, emotion/affect, and regulation) and two aggregate dimensions (action and outcome), as shown in Figure 2. We recognise that readers may be surprised to see 'memories' categorised as an action rather than an outcome code. Unlike our outcome codes, which reflect emotional or relationship-related processes, the theme 'memories' occupies a somewhat intermediate position. We have placed it in the action dimension because it primarily refers to the active process of creating and recalling memories in later phases of a relationship, which can then lead to emotional or relational outcomes.

Inter-coder reliability was substantial, with $\kappa = 0.62$, $z = 104$, $p < .001$ across all codes and phases. Agreement was similarly high for the attraction ($\kappa = 0.62$, $z = 60.27$, $p < .001$), building ($\kappa = 0.60$, $z = 58.65$, $p < .001$), and maintenance ($\kappa = 0.63$, $z = 61.65$, $p < .001$) phases. Tables S4 and S5 in the Extended Data (see OSF repository) further show that all Kappas for second-order themes were consistently above 0.40, indicating at least moderate agreement ($M = 0.57$, $SD = 0.12$, range = 0.40 - 0.65). Of the 55 first-order codes, 76% showed at least moderate agreement (> 0.40), and 96% achieved at least fair agreement (> 0.20) ($M = 0.58$, $SD = 0.21$,

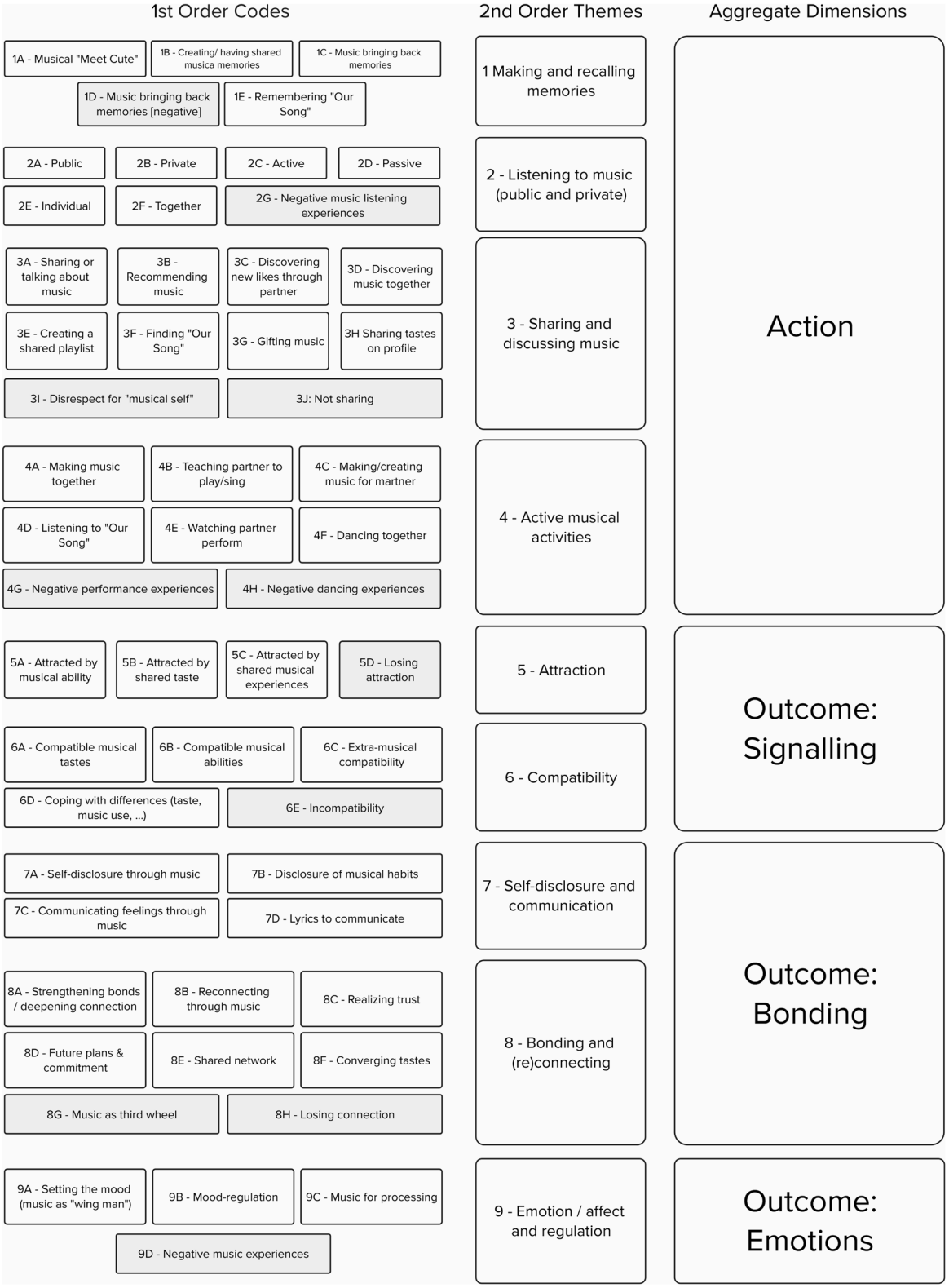


**Figure 2. Full list of codes and higher order themes.** Note. Negative valence codes are shown in grey. Code descriptions can be found in the extended data (see OSF repository).

**Table 2. Correlations between the role of music overall and in contributing to the three aspects of love (intimacy, passion, commitment) and personal characteristics, including means and standard deviations.**

| | Variables assessing personal characteristics | | | | |
|---|---|---|---|---|---|
| **Variables assessing the role of music** | **Musical expertise (M = 0.00, SD = 0.83)** | **BMRQ Total Score (M = 4.04, SD = 0.46)** | **Gender:: female** | **Age (M = 27.18, SD = 9.27)** | **Education (M = 4.77, SD = 1.17)** |
| Overall role of music | .22* | .47*** | .02 | .07 | -.01 |
| Music strengthening passion | .09 | .38*** | -.06 | .04 | -.06 |
| Music strengthening intimacy | .03 | .34*** | .03 | .03 | -.05 |
| Music strengthening commitment | .14 | .25** | -.04 | .18 | .06 |

*Note*. Education was measured by the highest level of education achieved (1 = compulsory education without vocational training; 7 = doctorate/PhD; see the Methods section for all answer options). BMRQ = Barcelona Music Reward Questionnaire.

*$p < .05$, ** $p < .01$, ***$p < .001$, with all p-values corrected using the Benjamini-Hochberg method.

range = 0.12 - 1.00). The code with the lowest agreement was 5C ('Attracted by shared musical experiences', $\kappa = 0.12$), followed by 6C ('Extra-musical compatibility', $\kappa = 0.19$).

Given the high level of agreement between the coders, we present the qualitative responses based only on those codes on which both coders agreed, to increase the robustness of the findings. Consequently, only the codes that both coders identified as present in a participant's response were included in the analysis. Below, we present the frequency with which each aggregate dimension, second-order theme and first-order code was referenced, expressed as a percentage of participants who mentioned it at least once, either across all three open-ended questions or within a given phase.

***Aggregate dimensions: Action and Outcome.*** Regarding the two aggregate dimensions of action and outcome (the latter subdivided into bonding, signalling, and emotions), 72.4% of participants mentioned musical actions in at least one of their responses, which included activities such as listening to music, sharing music, and creating music. Bonding as an outcome, involving the themes connection/reconnection and self-disclosure, was mentioned by 39.7% of participants. Signalling was mentioned by 40.2% of participants and referred to indications of attraction (e.g., being attracted by the musical ability of a potential partner) or compatibility (e.g., finding out about shared musical tastes or extra-musical compatibility). Emotion as an outcome appeared in 13.2% of participants' responses and involved (co)regulation of emotions, such as setting the mood or processing emotional experiences.

Across all relationship phases, musical actions show a consistent presence, being present in 58.0%, 56.9%, and 44.8% of participants' responses in the attraction, building, and maintenance phases, respectively. Similarly, bonding was observed across all phases with 18.4%, 19.0% and 19.5% in the attraction, building and maintenance phases respectively. Signalling was most pronounced in the attraction phase (27.0%), followed by the building phase (14.4%), and maintenance phase (13.2%). Finally, emotions were less pronounced in all phases, with 7.5%, 5.2%, and 2.9% in the attraction, building, and maintenance phases, respectively.

***Second-order themes.*** The heatmap in Figure 3 provides an overview of theme frequencies, based on the percentage of participants who mentioned codes belonging to each theme, both overall and across phases. Overall, the most frequent theme was listening to music in public and private contexts (Theme 2), followed by sharing and discussing music (Theme 3) and engaging in active musical activities (Theme 4). We also observed variations in the prominence of themes across phases. For example, 'listening to music' increased in frequency from the attraction phase to the maintenance phase, while 'sharing and discussing music' was more common in the attraction and building phases and decreased in the maintenance phase. The theme of 'making and recalling memories' (Theme 1) was most prevalent in the attraction and, to a lesser extent, maintenance phases, where participants referred to creating shared memories early on and recalling them later. These participant responses include quotes such as, "Having that song as a reminder of all the good in the relationship and why you love the other person, having positive memories tied to that and other songs that are brought up when you listen to them[...]" (Participant 116), and

> "Certain songs discovered and consumed during that period (especially when they were relationship pop [songs]) connect with that time and reinforce the feeling of attraction. I've always felt that the songs I've consumed a lot tie in with important events in my life during the listening period, as well as the seasons." (Participant 168)

Feelings of attraction through music were the most prevalent in the attraction phase (Theme 5), whereas references to

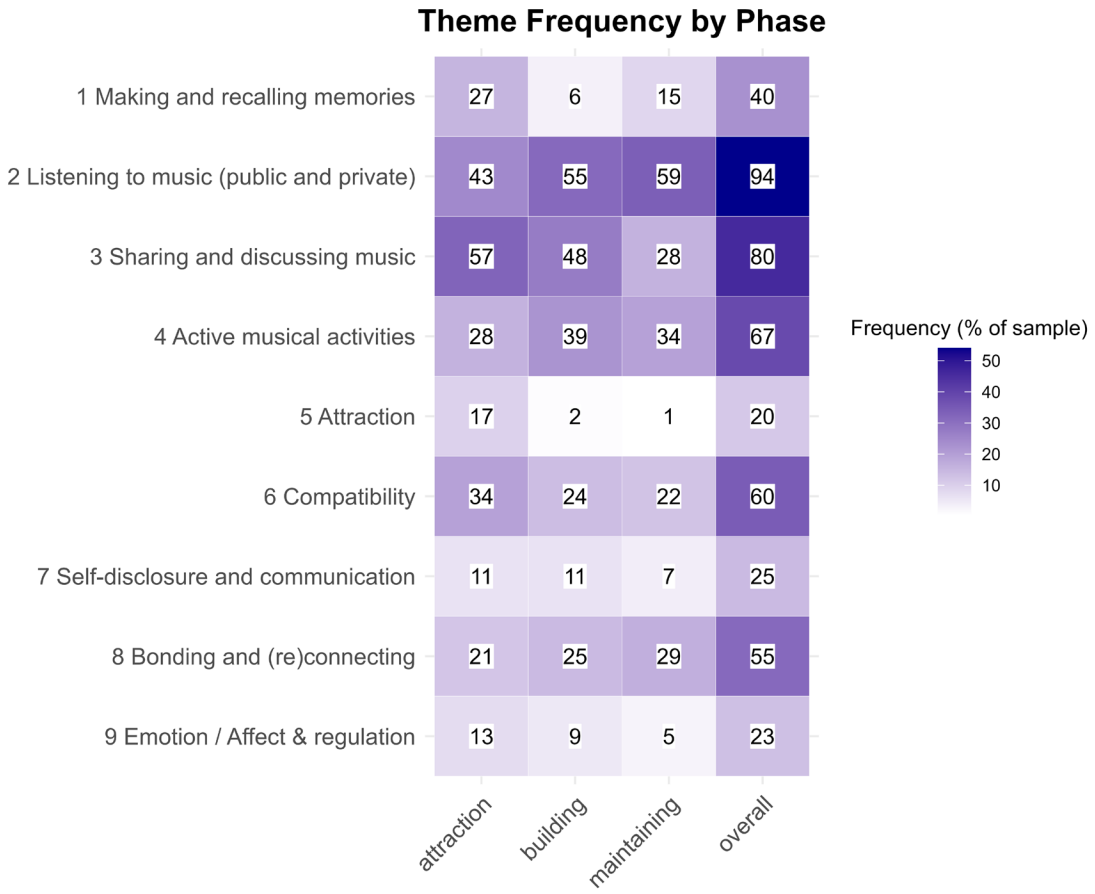


**Figure 3. Frequencies of second-order themes across relationship phases, shown as percentages of participants (color) and absolute participant counts (numbers).**

compatibility through music (Theme 6) were present in all phases, but again mostly in the attraction phase. The themes 'Self-disclosure and communication' (Theme 7) and 'Emotion/affect & regulation' (Theme 9) were more prominent in the early stages of the relationship. Regarding self-disclosure, participants detailed instances in which they revealed personal information to their partners, including their musical preferences and experiences, and used songs or song lyrics to communicate their feelings and intentions to their partners. Quotes exemplifying this theme include, "we shared playlists of music that we like. also we exchanged playlists with music in our native languages, as we are an international couple (finnish and spanish)." (Participant 17), "You can also ask which songs you listened to as a child and find out something about your family environment." (Participant 326), Regarding emotion/affect & regulation, participants wrote about experiences in which music was used either intentionally or unintentionally to set the mood or affective tone while together or independently. Examples of this theme in participants' responses include quotes such as,

> "We both have a playlist of songs that the other one has suggested to us. I've added 'extra' songs to mine that remind me of him/our relationship. And when I miss him or am generally just having a bad day or am sad, I listen to this playlist. It calms me down." (Participant 386)

Many participant responses in which this theme was observed discussed the importance of music before, during, and/or after sex. These participants' responses shared ideas such as:

> "I think that the choice of music is extremely important during sex. In my experience, the type of music has a significant effect on sex and therefore also determines whether it vibes. What I've also noticed personally in this context is that "more relaxed" and "romantic" music only feels good with people you really like. So music can also be an indicator of how comfortable I feel with a person and how vulnerable I can be." (participant 238)

***First-order codes.*** In the action dimension, three of the most frequent codes were related to listening to music: listening to music together (2F, $n$ = 88, 15.6%), listening to music in public (2A, $n$ = 52, 29.9%) and listening to music in private (2B, $n$ = 37, 21.3%). In addition, 28.2% of participants mentioned sharing and talking about music (3A, $n$ = 49), and 19.5% mentioned making music together (4A, $n$ = 34). In the outcome dimension, the most prevalent codes were compatible musical

tastes (6A, *n* = 37, 21.3%) and strengthening bonds/deepening connections (8A, *n* = 33, 19.0%), followed by realising incompatibility through music (6E, *n* = 16, 9.2%).

Table 3 provides an overview of the top three codes in each relationship phase, separately for the action and outcome dimensions. Across all phases, the most common action codes consistently involve listening to music together (together, in public, and in private; 2F, 2A, 2B), whereas the outcomes of musical activities vary according to the relationship phases. In the attraction and building phases, participants primarily mentioned compatibility (e.g., having compatible tastes or musical abilities, 6A) and to a smaller extent incompatibility (e.g., finding out to have different tastes, 6E), followed by deepening bonds through music (8A). In the maintenance phase, coping with differences becomes more prominent (e.g., finding a way to deal with differences in musical preferences, 6D), as do topics such as incorporating music into future plans and commitments (e.g., planning dance lessons or choosing of music for a wedding, 8D).

**Table 3. Most prevalent (top three) first-order codes across relationship phases.**

| Code | Frequency | Percentage (by phase) |
|---|---|---|
| ***Attraction Phase*** | | |
| **Action** | | |
| 2F - Together (music listening) | 40 | 23.0 |
| 3A - Sharing or talking about music | 38 | 21.8 |
| 2A - Public (music listening) | 17 | 9.8 |
| **Outcome** | | |
| 6A - Compatible musical tastes | 25 | 14.4 |
| 8A - Strengthening bonds / deepening connection | 17 | 9.8 |
| 5A - Attracted by musical ability & 5B - Attracted by shared taste | 8 | 4.6 |
| ***Building Phase*** | | |
| **Action** | | |
| 2F - Together (music listening) | 46 | 26.4 |
| 3A - Sharing or talking about music | 20 | 11.5 |
| 2A - Public (music listening) & 4A - Making music | 19 | 10.9 |
| **Outcome** | | |
| 8A - Strengthening bonds/deepening connection | 17 | 9.8 |
| 6A - Compatible musical tastes | 14 | 8.1 |
| 6E - Incompatibility | 8 | 4.6 |
| ***Maintaining Phase*** | | |
| **Action** | | |
| 2F - Together (music listening) | 53 | 30.5 |
| 2A - Public (music listening) | 35 | 20.1 |
| 2B - Private (music listening) | 22 | 12.6 |
| **Outcome** | | |
| 6D - Coping with differences | 12 | 6.9 |
| 8A - Strengthening bonds/deepening connection | 8 | 4.6 |
| 6E - Incompatibility, 8D - Future plans & commitment, & 8H - Losing connection | 7 | 4.0 |

A more detailed heat map of the frequency of all 55 first-order codes across the relationship phases is provided in Figure 4.

***Negative experiences.*** Overall, the majority of participants ($n$ = 139, 79.9%) described positive experiences with music, whereas a smaller proportion ($n$ = 36, 20.7%) reported negative

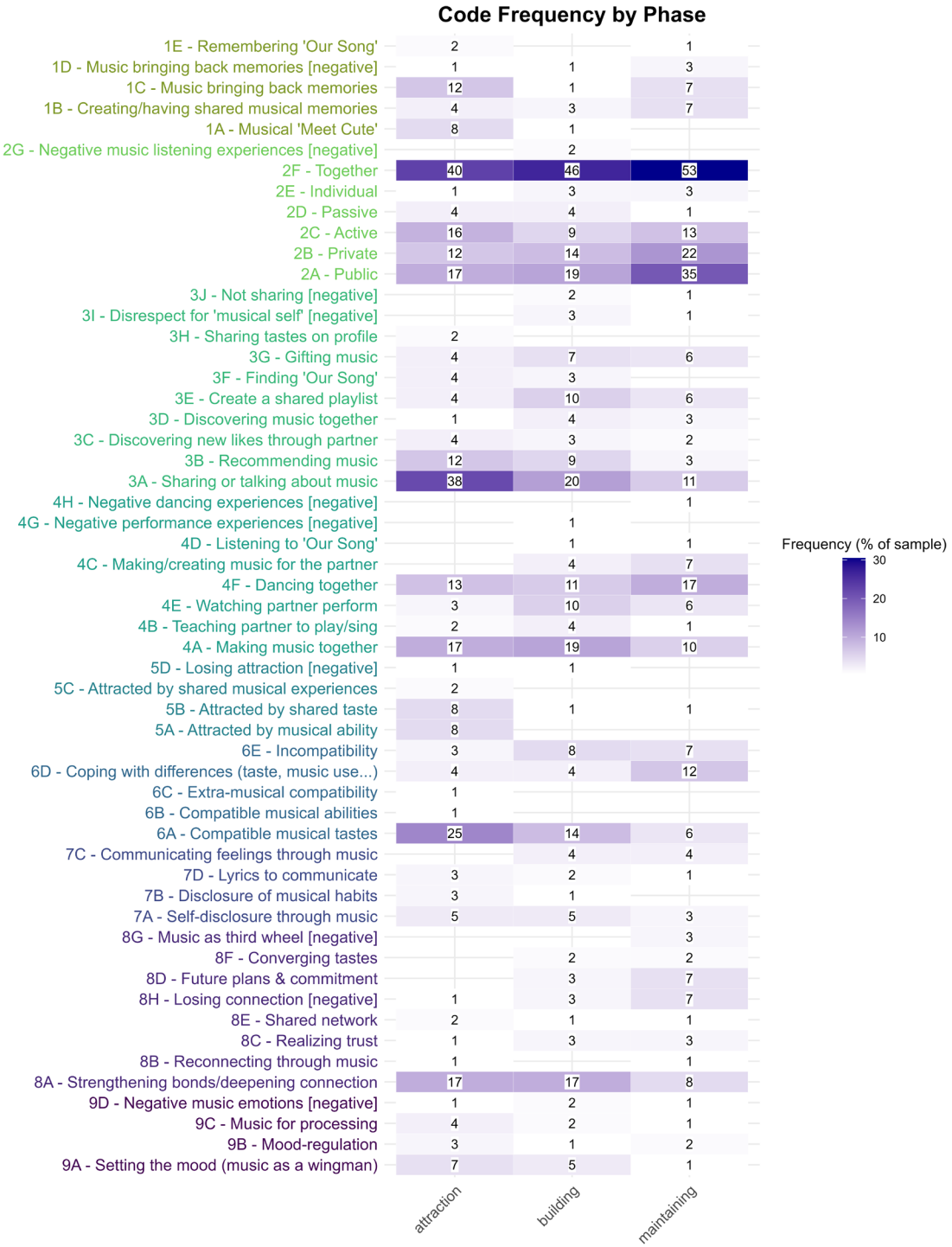


**Figure 4. Frequencies of first-order codes across relationship phases, shown as percentages of participants (color) and absolute participant counts (numbers).** *Note*. The text colors of the codes indicate the nine higher order themes to which the codes were assigned: 1 = making and recalling memories, 2 = listening to music (public and private), 3 = sharing and discussing music, 4 = active musical activities, 5 = attraction, 6 = compatibility, 7 = self-disclosure and communication, 8 = bonding and (re)connecting, 9 = emotion/affect and regulation.

experiences. Negative experiences were most frequently mentioned in the maintenance phase (11.5% of the sample), followed by the building phase (9.2%) and the attraction phase (4.0%). In the maintenance phase, these negative experiences most often concerned realising incompatibilities (4.0%, 6E; e.g., discovering differing musical tastes) and a loss of connection (4.0%, 8H; e.g., spending less time together due to one partner being too absorbed in music). Quotes from participants' responses exemplifying these negative experiences shared ideas such as,

> "Different music preferences led to us growing apart (he never really wanted to listen to music, but it was important to me) - even with the songs we listened to, when we listened to music we became estranged (I think) because we only ever listened to his songs." (Participant 370).

Similarly, both in the building phase and attraction phase, the most mentioned negative code was realizing incompatibility (6E), with 4.2% of participants mentioning the code in the building phase, and 1.7% of participants mentioning it in the attraction phase.

***Co-occurrence of codes.*** To explore whether certain action and outcome codes were frequently mentioned together, we conducted a thematic co-occurrence analysis following the method outlined by Scharp (2021). As shown in Figure 5, outcome codes belonging to compatibility (Theme 6) and bonding (Theme 8) mostly co-occurred with action codes. Of the compatibility codes, compatible tastes (6A) showed the most co-occurrences, specifically listening to music codes (2F together, n = 19; 2C active, n = 7; 2A in public, n = 7), sharing music (3A, n = 15), and actively making music (4A, n = 5). Participant responses illustrating these co-occurrences included descriptions of actions such as, "Discussing musical preferences, and finding common interests, setting up a date location based on mutual musical interests (e.g. jazz bar), meeting up at a festival." (Participant 110). The codes belonging to bonding (Theme 8), specifically strengthening bonds (8A), mostly co-occurred with listening to music (2F, n = 8) and sharing music (3A, n = 8). Responses such as, "Going to concerts together and generally listening to songs that both partners like was a nice experience. I feel more connected to my partner when he has at least some idea of what music I like [...]." (Participant 245- 8A and 2F) demonstrate the co-occurrence of these codes.

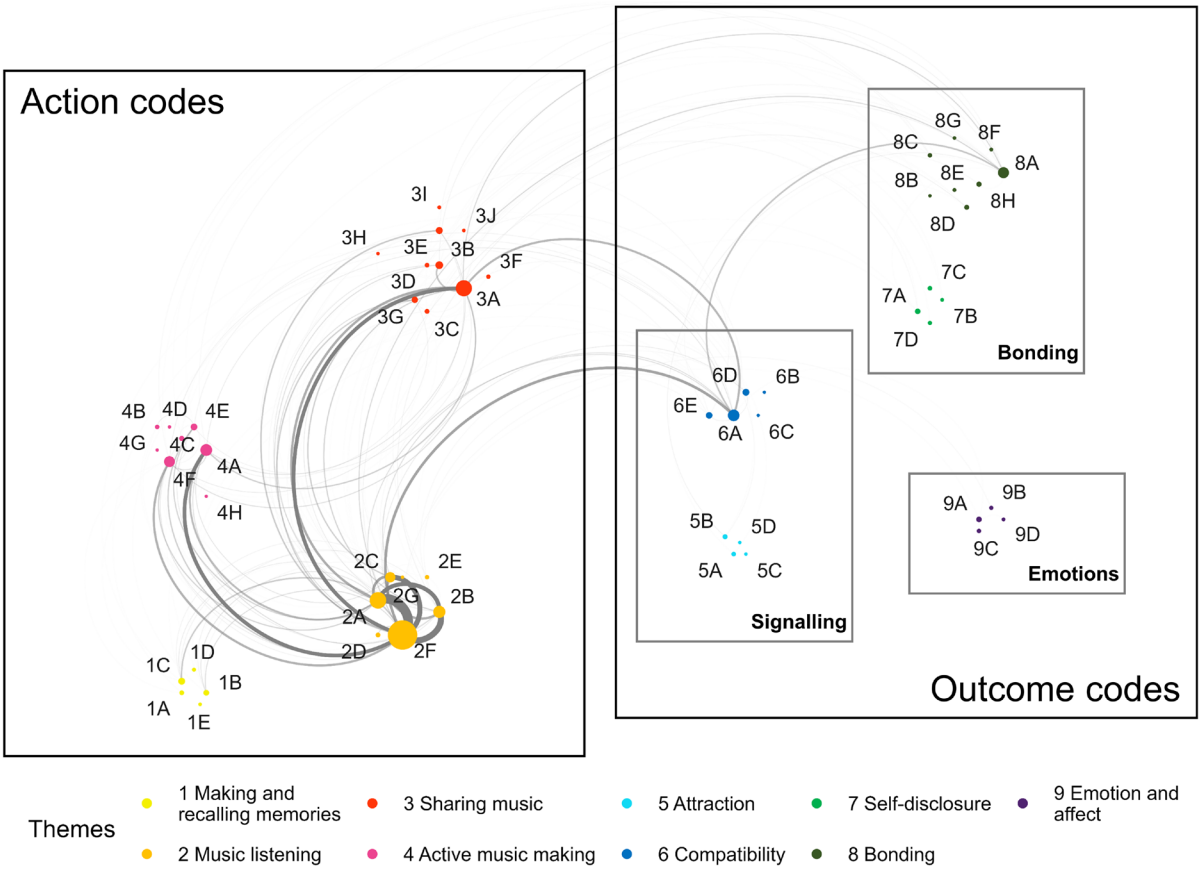


**Figure 5. Co-occurrences of action and outcome codes across all relationship phases.** Circle sizes indicate the frequency of individual codes, and line thicknesses indicate how often the two codes (absolute numbers) were mentioned in the same responses.

A full matrix of co-occurrences overall and separately by relationship phase can be found in the Extended Data (see OSF repository).

## Discussion

The present study is the first to explore the role of music for different aspects of love across the stages of romantic relationships. In our sample of 174 participants, who were mostly female and musically oriented, the quantitative results suggest a medium to high overall importance of music, which is stronger for intimacy and passion than for commitment, and for the attraction and building phases than for the maintenance phase. In addition, music-related personal characteristics (particularly sensitivity to music reward and, to a lesser extent, musical expertise) were associated with higher ratings for the overall role of music and its contribution to the three aspects of love. However, the general pattern of results, such as the relatively lower contribution to commitment, did not change with reward sensitivity.

From the 351 qualitative responses, two aggregate dimensions (action and outcome) emerged, comprising nine second-order themes and 55 first-order codes. Participants frequently mentioned musical actions, with listening to music (54% of participants), sharing or discussing music (46% of participants), and making music together (38.5% of participants) as the most common first-order codes. Outcomes were less frequently mentioned but centred on bonding and (re)connecting (38.6%), and learning about compatibility through music. Notably, second-order themes such as signalling attraction and compatibility and using music for emotional communication and regulation were most common in responses for the attraction phase, whereas bonding through music and engaging in musical activities were more commonly reported for the building and maintenance phase.

### Music across the love-span

Using a mixed-methods approach, the present study aimed to provide an overview of how important music is at different relationship stages, and whether it is perceived as strengthening different facets of love. Quantitative responses indicated that music was perceived as playing a similar role in fostering intimacy and passion. In contrast, commitment was clearly differentiated, with participants reporting that music played a smaller role in strengthening this facet.

The open-ended qualitative responses allowed participants to elaborate on the musical behaviours they associate with each stage and why they were important. Consistent with the theoretical framework guiding this study, some parallels can be observed between the generated codes and Sternberg's *Triangular Theory of Love* (Sternberg, 1986). Most notably, participants often reported second-order themes involving music as a bonding experience, which could correspond to an increased level of 'intimacy' in Sternberg's model, while second-order 'attraction' codes could correspond to the passion dimension. Codes relating to 'commitment' were less frequent. In fact, only one code, 8E (Future plans and commitment), directly addressed this dimension and was mentioned by 5.7% of participants in at least one of the phases. Similarly, in the quantitative results, music was rated as being least contributing for this facet, although some exceptions will be discussed in the maintenance phase below.

In the quantitative results, there was a general trend of music being less important over time, particularly towards the maintenance phase. When looking at the types of activities being mentioned in the qualitative data, listening to music together seems to be done throughout a relationship, but becomes more common over time. Meanwhile, sharing and discussing music becomes less common; as people get to know each other's music tastes better, there is less need to talk about it. Making music with a partner slightly peaked during the building phase. Although emotion regulation was not mentioned as often as other codes, it seems that music is used more for regulation mostly at the start of a relationship. Certain trends emerge when looking at which codes are mentioned together, which enables actions to be matched to outcomes. Assessing signals of compatibility with a partner was often mentioned, along with shared music listening, discussing music, and active music making. Meanwhile, people often mentioned increased bonding and connection as an outcome of joint listening and discussing music. Overall, throughout the course of a relationship, music seems to be used less to assess compatibility, and more to deepen relationships.

***Attraction.*** In the attraction phase, music was considered to be of high importance, particularly for intimacy and passion. Participants were most likely to mention discussing music (32.8%) and listening to music together (24.7%) in this phase. Previous literature has also suggested that talking about music is a common activity during dating, as it is an easy early conversation to learn about strangers (Rentfrow & Gosling, 2006). Our participants also mentioned feeling attracted to those with compatible music tastes (4.6%) or to note compatibility in tastes (14.4%), which is consistent with assortative mating strategies, that is, that people seek out mates who are like themselves (Luo, 2017). Simultaneously, some participants also said that they found musical ability to be attractive to a potential partner (4.6%), which appears to be consistent with the theory that musicality is a sexually selected trait (Miller, 1999). At the same time, our quantitative analyses revealed that individuals with higher musical expertise and music-related reward sensitivity placed significantly higher importance on a partner's musical ability. Overall, in this phase participants seemed to evaluate potential partners based on musical compatibility, especially music preferences and to a smaller extend, musical ability. There were also some people who already mentioned deepening the connection with a potential partner through music during the attraction phase, although this becomes more prevalent in the next phase.

***Building.*** Most participants rated music as equally important during the building phase as in the attraction phase, and again music was rated to contribute mostly to the intimacy and passion facets of Sternberg's (1986) triangular theory of love. In

the qualitative responses, sharing and talking about music (11.5%) as well as shared music listening (26.0%) were just as common as in the attraction phase. Shared music making was mentioned most in this phase (10.9%). In these instances, shared music making may have been used as a means of increasing feelings of social closeness, as suggested by previous research (Dunbar, 2012; Savage *et al.*, 2021). Correspondingly, increasing connection with a partner became a much more frequent outcome in this phase; attraction may have already been established, but at this stage people were getting to know each other more. Nevertheless, many participants were still assessing their partners for compatibility, and some also reported noticing incompatibilities more as they got deeper into the relationship (4.6%). This could reflect the ending of what may be referred to as the 'honeymoon phase' or 'new relationship energy', which often occurs at the start of a relationship (Huston *et al.*, 1986; Lucas *et al.*, 2003), as participants moved towards the maintenance phase of their relationships.

***Maintaining.*** In general, music was seen as less important during the maintenance phase. Contrary to our hypothesis (Bamford *et al.*, 2024), self-report ratings indicated that music was not seen as more important for enhancing commitment at this phase. Nevertheless, in the qualitative responses, some participants did mention that music played an important role in their future planning (4.0%) when reflecting on the maintenance phase, which was less common in prior stages. The most prevalent responses were around choosing music for weddings, for example, "to try and blend our eclectic and different tastes in music into a cohesive couple story" (Participant 49), while others mentioned discussing the songs that they would sing to their future children (participants 33 and 208), or even dreams of "owning a record store together" (Participant 271). It seems that, although participants did not report that music was important for commitment in their relationship on average, there were specific ways in which music was involved in future planning and commitments for some participants.

Other activities mostly decreased in frequency during this phase, except for music listening, which was reported more frequently (30.5%). Bonding and compatibility were the most common outcomes in this phase, just like in the building phase, although here bonding was more frequent (see Figure 3). The way participants discussed compatibility seemed to be different in the maintenance phase, as participants were more likely to talk about how they had overcome differences, or had grown apart, rather than discovering shared musical preferences as they did in earlier phases. As with the previous stages, many participants mentioned that music helped strengthen their bond with their partner, but it also became more common at this stage to begin losing connection, sometimes connected with diverging musical interests.

## Individual differences

Our quantitative analysis suggests that music plays a greater role overall and in terms of the three aspects of the Triangular Theory for individuals with higher levels of musical reward sensitivity and, to a lesser extent, musical expertise. Similarly, individuals with higher expertise and music reward reported talking more about music preferences when they met a potential partner, they tended to place more importance on having similar music tastes and on the partner having high musical ability. The BMRQ further correlated with having an "our song" and seeing music as more important than other leisure areas. Exploratory analyses further revealed a main effect of BMRQ when examining the importance of music in strengthening the three facets of love across different relationship phases. The absence of interaction effects indicates that music reward sensitivity primarily prompts individuals to value music more in their relationships overall, rather than linking it to the enhancement of specific facets of love or particular phases of a relationship.

These findings tend to support the idea that music serves as a way to measure similarity with a partner (e.g., Luo, 2017), rather than being a universally attractive trait (e.g., Miller, 2000). Thus, music appears to be particularly important in romantic relationships of individuals who place a high value on it or have strong musical skills themselves. Nevertheless, participants at all levels of expertise and musical reward reported engaging in musical activities and described related outcomes in their qualitative responses. Therefore, music has some value for all, for example, in terms of providing insights into other people's personalities, values, arousal preferences, and desire for cognitive stimulation (Boer *et al.*, 2011; Getz *et al.*, 2014; Vella & Mills, 2017).

## Limitations and future directions

While the strengths of this study include the mixed-methods design and a diverse sample in terms of musical background, some limitations should be noted. Most participants were female, young, and well educated, which may limit the generalizability of our findings. For example, bonding behaviours through music and the qualitative themes we identified may reflect female perspectives more strongly. Younger participants may emphasise experiences from the early stages of relationships rather than those from later maintenance phases. Participants with less musical training, or who are older, might report different patterns, such as less frequent shared music-making, or a different balance of positive and negative music-related experiences. Finally, as our sample was drawn from a Western cultural context, the ways in which music is used in romantic relationships, and the meanings attributed to it, may differ in other cultures. In terms of measurement, we assessed the role of music in intimacy, passion and commitment using three simple, self-generated questions. As these questions were not based on pre-existing scales, the results should be interpreted with caution. In addition, participants were asked to retrospectively report on their experiences with music in the context of past relationships and relationship stages, which limits causal claims from the co-occurrence analysis, as some responses included multiple experiences or relationships. Consequently, co-occurrence only indicates that actions and outcomes were mentioned together, and not that one caused the other. To overcome this limitation, future research could include recruiting participants who are currently in different

phases of a romantic relationship, collecting dyadic data from both romantic partners, or using designs such as experience sampling methods.

Regarding the moderating effect of music-related individual differences, the present study provides an initial exploration of how such traits relate to the role of music in romantic relationships. Further research could investigate additional moderators, such as traits associated with musical tendencies (e.g. openness and empathy), to clarify under what circumstances and for whom music shapes romantic connections. Finally, as this study focused specifically on the role of music in romantic relationships, it remains unclear whether similar results would emerge for other shared leisure activities or for other types of relationships, such as close, non-romantic friendships. Existing research suggests that discussing musical preferences is among the most frequent topic when initiating a relationship with a stranger (Rentfrow & Gosling, 2006). This indicates that music may play a particularly important role in social bonding, although this has yet to be tested directly.

## Conclusion

Considering the relevance of music for social bonding as well as the vast number of songs that address love, it is astonishing how little attention has been paid to study the role of music in romantic relationships. The current study provides a first systematic investigation of the relevance of music for the three core aspects of love across the three major phases of romantic relationships. Based on the results the core affordance of music appears to relate to intimacy: learning about, getting closer, and feeling more connected to a partner. The capacity of music to facilitate social intimacy resonates well with the literature on music as social-bonding in general (e.g., Saarikallio, 2019; Savage *et al.*, 2021; Tarr *et al.*, 2014). This raises the important question of whether the role and purpose of music in romantic love truly differs from the role that music serves for human social behaviour in general. Activities such as music listening during sex, music that inspires future plans for family, or the use of music to ignite passion are perhaps special for romantic relationships, but testing the broader similarities with other types of relationships could be an interesting avenue for future research. Overall, this study offers important new insights into how music is present in romantic relationships, which can be meaningful from music research to couple therapies and broader approaches of studying human relationships.

## Ethical approval and consent

This study was considered exempt from ethics committee approval in accordance with the guidelines of the local university ethics committee. Prior to participation, the participants were fully informed about the study and provided informed consent in accordance with the principles of the Declaration of Helsinki. Participants gave their written consent to the following statement by clicking on a on the 'I agree' button:

*I am at least 18 years old and freely agree to participate in this research study. I have been informed about the purpose, procedures, and nature of the study and understand them fully. I am aware that my participation is voluntary, and I have the right to withdraw from the study at any time without any penalty or consequences. I understand that the data collected during the study will be kept strictly confidential and anonymized, ensuring my privacy. I hereby grant permission for the data generated from my participation to be used in the researcher's publications on the topic of the study.*

Data were securely stored on the university's server to ensure the anonymity and confidentiality of all participants.

## Data availability

The dataset and analysis code for this study are available in the following OSF repository:

Vigl, J., Bamford, J. S., Saarikallio, S., & Fleckenstein, A. M. (2024, November 22). Music Across the Love Span. https://doi.org/10.17605/OSF.IO/EH8WN (Vigl *et al.*, 2025).

This projects contains the following underlying data:

- Extended data:
  - **extended_data.docx**: This document contains five additional tables (Tables S1–S5) and one figure (Figure S1).
  - **co-occurenceMatrix_full.xlsx**: Full co-occurrence matrix of action and outcome codes overall and separately for the relationship phases.
- Quantitative data:
  - **data_wide.csv**: Anonymized answers to the quantitative questions in wide format.
  - **data_long.csv**: Anonymized answers to the quantitative questions in long format.
  - Codebooks for both datasets are provided in the same location
- ∉ Qualitative data:
  - **qualitativeData_wide.csv**: First-order codes assigned by two coders in wide format. The ID column in this dataset refers to the participant index number that is also provided in the quantitative datasets
  - **qualitativeData_long.csv**: First-order codes assigned by two coders in long format. The responseID column in this dataset refers to the participant index number that is also provided in the quantitative datasets
  - **openResponses.xlsx:** This file contains the qualitative data (responses to the open-ended questions) in a de-identified format (i.e., without the

participant ID), together with the phase for which the response was given, as well as the first-order codes and second-order themes assigned by both coders.

- Data analysis:
  - **dataAnalysis.R**: All quantitative and qualitative analysis performed for this article.



## Acknowledgements

The authors wish to thank Marcel Zentner for his advice in the planning of this study, and all of the participants for contributing their stories.

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# Open Peer Review

## Current Peer Review Status: ✔ ? ? ?

**Version 2**

Reviewer Report 22 November 2025

https://doi.org/10.21956/openreseurope.23478.r63297



?

**Adam Bode**
The Australian National University, Canberra, ACT, Australia

Thankyou for the opportunity to review the manuscript Music across the love-span: a mixed methods study into the use of music in romantic relationships.

It investigates, using quantitative and qualitative methods, the perceived importance of music on three components of love across different stages of a romantic relationship. I generally think the article is interesting and should be indexed with some changes. I have read the comments of reviewer 3 and agree with their assessment. I will not comment on issues they have already commented on. I also have no expertise in qualitative analysis, so cannot assess that aspect of the manuscript.

**Introduction:**

The authors misuse the term “romantic love”. Romantic love in the English language (Collins, 2025), according to the APA (American Psychological Association, 2018), according to Sternberg’s theory (Sternberg, 1986), and according to the convention among love researchers (Bode & Kowal, 2023) is a motivational state that commonly occur in the early stages of a romantic relationship, is associated with extremely strong cognitions, emotions, and behaviours, and usually lasts in the vicinity of 18 months (Bode & Kushnick, 2021). What you mean is “love in romantic relationships”, which encompasses both romantic love and companionate love (the less intense love that often exists in long-term married couples - (Walster & Walster, 1978).

Please change your references to “romantic love” with the term “love in romantic relationships”. You should probably also define what is meant by this term, and specify it includes both romantic and companionate love. There are others, including one notable love researcher, who misuses this term, so it is understandable that you would also misuse the term. Please fix.

When you talk about the validations of Sternberg’s theory, you should probably also include (Kowal et al., 2024) which validated a short-version of the scale in heaps of languages.

Your romantic relationships stages subsection relies heavily on work that is rather old. Please emphasise that this is just one framework and provide evidence in support of it from the past ten years if this available. It's fine to use this framework as a heuristic, but please be aware that the timeframes provided are nonsense, and there is substantial variation in the trajectory of romantic relationships. This framework also does not recognise that the norm among romantic relationships is to be friends first, so a type of bond is usually formed in advance of the romantic relationship. It also does not consider different types of love. Please emphasis that this is a "useful" framework for the current purpose.

Please define mate choice.

**Methods**
You conflate sex and gender. Female and male are sexes. Non-binary is a gender identity.

If possible, please check to see if there is an effect of age on the results of the quantitative analysis. Music serves different functions across the lifespan. And for people who are not musicians, the importance of music peaks in adolescence and early adulthood and becomes less important with age.

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**Is the work clearly and accurately presented and does it engage with the current literature?**
Yes

**Is the study design appropriate and is the work technically sound?**
Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**
Yes

**Are all the source data and materials underlying the results available?**
Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

I cannot comment. A qualified statistician is required.

**Are the conclusions drawn adequately supported by the results?**
Yes

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** Love

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Reviewer Report 19 November 2025

https://doi.org/10.21956/openreseurope.23478.r63211



**Andrea McGraw Hunt**
Rowan University, Glassboro, New Jersey, USA

Thank you to the authors for these revisions, I appreciate their consideration of my review and responses. I have no additional comments to make on this study and look forward to its indexed.

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** I am a board-certified music therapist with expertise in a wide range of qualitative and quantitative methodologies, particularly neuroscience and chronic pain. I have supervised graduate research involving survey design.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Reviewer Report 07 November 2025

https://doi.org/10.21956/openreseurope.23478.r63299



**Claire Howlin**

Trinity College Dublin, Dublin, Ireland

Many thanks for inviting me to review this interesting paper, which aims to explore how the importance that you assign to music is related to romantic relationships, musical expertise and musical reward. The authors find that the importance that you assign to music in a romantic relationship is related to how much reward you derive from musical experiences. Based on small to medium correlations. The authors identify that the perceived importance of music is different for each aspect of love, intimacy, passion and commitment, but unfortunately the nature of these differences are not clearly reported in the results section. The authors also identify that the perceived importance of love is different between the maintenance phase and the building and attraction phase, but it is not clear at which phase that music plays a greater role. Similarly the discussion section, does not accurately reflect the results that are reported. Clearer and more consistent reporting throughout the manuscript is needed before this study could be indexed.

Please see details below of issues that need to be addressed.

Introduction:
At the end of this section an aim is put forward: to explore perceptions of the role of music at different stages of romantic relationships and to examine which musical activities and their outcomes influence partner choice and facilitate or inhibit romantic feelings.
Were musical activities examined as part of this research?
Which outcomes were examined as influencing partner choice?
Did the study examine how musical activities inhibit romantic feelings?

What do the authors mean by ‘role of music’?

Check the text thoroughly for minor typos e.g. ‘This combination’ under present study

*RQ1*: How important is music in the context of romantic relationships, and does it contribute to strengthening intimacy, passion, and commitment at different stages of romantic relationships?

Result: The importance that you assign to music in a romantic relationship is related to how much reward you derive from musical experiences. Based on small to medium correlations

Research question 1 is set up as causational, but the analysis is correlational. Based on the data and analysis it is not possible to ascertain if the importance a person assigns to music strengthens intimacy.

Were the hypotheses registered before the data collection, or is this an exploratory study? In the results section RQ2 is framed as an exploratory analysis, so it might be better to state that more explicitly here.

RQ2: The first hypothesis is not clear four variables are listed (musical expertise, sensitivity to musical reward, perceived importance of music in romantic relationships and perceived importance of music in different aspects of love), and the direction of the correlation is not stated. Does this need to be simplified, or separated into additional hypotheses?
“musical expertise and sensitivity to music-related reward may correlate with the perceived importance of music in romantic relationships overall, as well as in different aspects of love."

There is a large drop off between the number of participants who started the survey (402) , and the number included in the study (174). Could you provide more details on how the final sample was determined, and any decisions made on data missingness?

Limitation:
The qualitative aspect of the study was limited to a text box response, without any follow-up questions or prompts to elicit further detail from participants. This would likely limit the depth of information shared by participants.

Participants agreed that music has different levels of importance for different aspects of love and phase. However the effect size for phase is extremely small np2 = 0.07. The extremely small effect size needs to be clarified throughout the results and discussion. Indeed many authors may decide to report such a small effect as almost negligible.

For RQ1 the quantitative results report that there are significant differences between all aspects of love, but it does not report the direction or magnitude of the differences. Please report the direction of the differences.

The following text appears to first say that there is no difference in the reported general role of music across the three phases of a relationship, but then the means are reported as if there is a difference

“As shown in Figure 1, participants reported a high general role of music in all three phases (*M* = 4.00, *SD* = 0.89). The importance of music for the three components was higher in the attraction (*M* = 3.61, *SD* = 1.08) and building (*M* = 3.59, *SD* = 1.02) phases than in the maintenance phase (*M* = 3.31, *SD* = 1.05), while it appeared to be most important for intimacy (*M* = 3.96, *SD* = 0.97), followed by passion (*M* = 3.76, *SD* = 0.99), and commitment (*M* = 2.79, *SD* = 1.18).”

Table 2. Musical expertise variable appears to have a Mean of 0.00 (SD = 0.83). How could the Mean be zero when the lowest score on the Ollen scale is 1, and 43% of the sample reported a score of 2-5?

It’s unusual to see a frequentist analysis applied to a qualitative theme, its unclear what the purpose of this is, or how to interpret it.
There doesn’t appear to be any qualitative descriptions of the themes themselves, and this needs to be provided.

Discussion:

The opening lines of the discussion do not strongly convey the main findings reported in the results. Consider revising to make this stronger/clearer.

In the results section a key finding is that the importance that you assign to music in a romantic relationship is related to how much reward you derive from musical experiences. Based on small to medium correlations. But this is not clearly reflected in the discussion.

The discussion states that the results demonstrate a medium to high overall importance of music. Where is this demonstrated? Do you want to report the descriptive statistics for this variable.

The discussion states that the perceived importance of music is stronger for intimacy and passion than for commitment, but this is not demonstrated in the results. Although differences are reported, the size and direction of the differences is missing. “Pairwise comparisons using Bonferroni correction indicated significant differences between all relationship aspects ($p < .001$). Regarding relationship phases, there were no differences between the attraction and building phases ($p = 1.00$), but there were differences between the maintenance phase and both the attraction and building phases ($ps < .001$). “
Please report the main effects in full in the results section.

The discussion states that musical expertise is associated with higher ratings for the overall role of music and its contribution to the three aspects of love. However, the relationship between musical expertise and the overall role of music is .22 indicating an extremely weak correlation, and no significant correlation is found between musical expertise and three aspects of love. Please re-phrase the discussion section so that it accurately describes the results section.

Would you consider presenting the relationships between BMRQ and aspects of love first, and then in a new sentence present the relationships between musical expertise and aspects of love. Seperating them will make it easier to speak more precisely.

Limitations and strengths.

One of the strengths put forward is that there is a rich musical background, however the mean level of musical expertise reported is zero in Table 2. Please examine the reporting of the data and revise statements if necessary.

**Is the work clearly and accurately presented and does it engage with the current literature?**
Yes

**Is the study design appropriate and is the work technically sound?**
Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**
Partly

**Are all the source data and materials underlying the results available?**
Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**
Partly

**Are the conclusions drawn adequately supported by the results?**
Partly

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** Music Cognition, Health Psychology

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

**Version 1**

Reviewer Report 26 September 2025

https://doi.org/10.21956/openreseurope.20577.r59623



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**Daniel L Bowling**
Stanford University, Stanford, California, USA

OVERALL IMPRESSION AND RECOMMENDATION

It was a pleasure to read this informative and clearly communicated analysis of music in the context of normative human pair bonding. The length of my review reflects my thorough reading of the text and suggestions to improve it, rather than an abundance of problems with the paper. That said, I have several more substantive criticisms having to do with limitations/interpretation and data presentation/analysis. These are presented under “GENERAL CRITIQUES” or with *** *** in “SPECIFIC COMMENTS”. Provided that the authors can address these criticisms or better explain their perspective, I would happily recommend this manuscript publication. This is important but neglected topic and I applaud the author’s for getting the ball rolling. My recommendation is minor revision.

GENERAL CRITIQUES:

(1) The fact that the sample is nearly 6:1 female:male needs to be mentioned up front. One might very well expect the role of music in courtship / mating / bonding to be different women and men. Likewise, age would seem to be an important predictor, given that both mating behavior and engagement vary as a function of age. More broadly, I recommend that the author’s consider the limitations of their sample more seriously. E.g., given that the data was collected primarily from highly musical young women, how well should we expect them to generalize, e.g., to older couples, to men, or to those who haven’t spent 15 years playing an instrument (on average).

Culture also relevant here. Understanding the absence of primary research, any data (or even anecdotes) about music and romance from other cultures, would provide useful context.

(2) The degree to which the overall high importance of music in romantic relationships reported

here was related to individual differences in sensitivity to musical reward remains unclear. Why not approach this question empirically? For example, by splitting the data by high vs. low sensitivity to musical reward, and then comparing ratings.

(3) The positive/negative component of the data is really interesting (i.e., whether music promoted or obstructed romance), but doesn't appear to have been systematically analyzed or discussed despite being present in the codes. Can the author's provide any clarity here? E.g., A clearer indication of negative/positive frequency, and what this might, or might not imply? Perhaps the nature of the study is biased towards collecting positive accounts, but even so, people choosing to describe instances of incompatibility is interesting. How rare was it?

SPECIFIC COMMENTS ON THE TEXT, BY SECTION:
Most of these are aimed at improving the text or clarify. Those in bold are more important, and/or harken back to the above.

ABSTRACT:

"174 participants"
-Include male/female breakdown

INTRODUCTION:

"These effects are often attributed to the synchronisation involved, as engaging in synchronised actions commonly leads to increased feelings of social affiliation, trust, and prosocial behaviour"
-More clearly define "synchrony", which is a polysemous term. E.g., "These effects are often attributed to synchrony, as interpersonal temporal coordination of action commonly leads to …"

"Social space that aligns the intentions of participants"
-intentions and emotions?

"Little work…commitment in romantic relationships"
-Add biological context for why this is interesting? (this = "how music might influence partner choice or enhance feelings of intimacy, passion or commitment in romantic relationships". For example, in nature, singing is frequently associated with pair bonding (e.g., in gibbons and birds), leading to theories that center sexual selection in the evolutionary origins of music.

"One couple-specific"
-Maybe: "A prominent example of music in romance is the "couple-defining song".

"According to Harris et al. (2020) …" Nice to have a number here, but also wanting more context on the nature of the study. Something like, "Accordingly to Harris et al.'s analysis of XX couples in the US…"

In the next paragraph: "Other research has focused on …"
-Switch the order of the examples given to add focus to the more relevant point? I.e., research has found that musical traits are attractive, as is creativity more generally.

"That musicality"

-This term needs unpacking or qualification. In this context, it might be better to say “musical ability” if that’s what’s meant, or “musical interest”. -If “musicality” is preferred, briefly define it, e.g., “musicality (i.e., musical interest and/or ability)”

“Harwood & Wallace (2021)”
-Is there anything about the musical experience or ability of the couples in this paper that might represent a potential confound? For example, were these couples more compatible because both partners were musical? What is the relevant conclusion that the readers should take from this?

“RQ2… personal characteristics”
-Clarify the kind of personal characteristics that are being referred to here.

***
“RQ2… so musicality may correlate with the perceived importance of music”
-Clarify meaning. Is it something like “so higher musicality in a couple may indicate that both partners perceive music to be important”? Not clear what this has to do with other music-associated personal characteristics. Further, I’m not sure what adding romantic context to the basic question of what personal characteristics are associated with music brings to the table. Seems like I’m missing something here about what the authors are trying to get at.”
***

“While RQ1 and RQ2 will be answered with quantitative data”
-“answered” should be “addressed”

METHODS:

Specify education level of remaining 10% (e.g., “10% less than high school”). Is “highly educated” the best characterization? Roughly a third only finished high school, while 10% had less than that.

“Regarding musical background”
-Add generalization at the top of this paragraph to help the reader summarize the musical sensitivity of the group? It’s not easy to square the fact that 61% played/sang for 16 years on average with 51% reporting being non-musicians. These are imperfect measures but the reader still wants to know how they should think about this aspect of the sample… Highly musical, not very musical, etc…. “Diverse” (from the discussion)? Make the case.

“Participants were explained”
-Maybe: “Participants read text written by the experimenters explaining…”

“Music-related reward experience”
-“sensitivity to musical reward” (what the BMRQ measures)

“Quantitative measures”
-Presenting the questions in this paragraph in table form? Currently hard to parse and map to methods.

“continuous composite score…(alpha = 0.86)”
-Specify “Cronbach’s alpha”

-Move this stat to after “as these four items were internally consistent”.
-Restate what “these four items were” in parentheses after “four items”?

“music-related reward”
-Better: “sensitivity to musical reward” ?

“The exact wording…” Move this reference to the OSF repository to the start of the survey description. This way the reader knows right away that they can go look at the survey directly if they need to, so don’t need to get caught up on trying to parse exactly what it was from the methods alone.

Was the survey done in German? If so, it is worth mentioning, that the “wordings” provided have been translated for this manuscript.

“Data Analysis”
“Greenhouse-Geisser corrections as necessary”
-Add “for violations of sphericity”
-Were tests done to determine if GG correction was necessary? Describe.
-Describe stats software too.

“The first analysis predicted the role of music…the overall importance of music”
-In describing these models, it would be useful to know specifically what questions pertain to these variables.

“Associations between personal characteristics…”
-As noted above, the meaning of personal characteristics should be clarified, especially with respect to which survey questions were considered to assess it.

“Pearson correlations were used to identify…”
-Given that so many correlations have been tested, a correction for multiple comparisons seems appropriate, e.g., Benjamini-Hochberg.

RESULTS:

**Terms like “perceived general role of music” are difficult to map to specific originating questions, especially on the first read through before the reader understands the results. A table listing the quantitative questions and codes, like Q1, Q2, etc. would help**

“To determine whether there are personal characteristics associated with the role of music in romantic relationships”
-There almost certainly are, right? But the measures of “personal characteristics” included here are fairly limited…

**“…with the assessed personal characteristics: demographics…”**
**-Here we finally get a clear definition of what “personal characteristics” means in the context of this paper. This explanation should be provided earlier, ideally with some logic for why these have been selected.**

Are Pearson correlations appropriately applied to a variable like gender or education, which have presumably been treated categorically? Might want to explain the numerical coding scheme.

Figure 1. It's a bit confusing to have box plots and violin plots on top of each other (the meaning of the gray circles is not described in the legend). Recommend adding the actual data points and choosing either violins or boxes

***
Table 1. As shown, in addition to correlations been demographics and outcomes, correlations are also being assessed between outcomes and outcomes, and demographics and demographics. The later two cases are not of any importance to RQ2. Given the multiple comparison problem, I recommend only testing the correlations the authors care to test. For clarity, I also recommend separating the "personal characteristics" and outcomes by placing them on different axes.
***

"...achieved at least fair agreement".
-Which codes had the lowest agreement?

***
Under "Aggregate dimensions:.." How are percentages of responses related to percent of respondents? Do I need to worry that a subset of respondents have biases the results?
***

"(re)connection" and "(co)regulation".
-Clarify whether these terms imply, e.g., "connection and reconnection" or only reconnection.

"accounting for 68.6%, 73.0%, and 75.7%"
-add "of responses", presuming that is correct

"...signaling as an outcome, indicating attraction or compatibility"
-Add an example in parentheses here? To explain directly how music was used to signal attraction or compatibility

"...was represented in 7.6% of the codes"
-Does this mean that 7.6% of all codes were 3A? If so, better to say directly, and include the letter code.

"...only one code appeared in nearly five percent of the responses..."
-This cutoff seems arbitrary, even considering that it is only for descriptive purposes. Maybe something like: "In the outcome dimensions, codes were more variable, with the most frequent only occurring in 4-5% of responses. Examples include..."

"(in)compatibility"
-Explain. Were responses mostly referring to compatibility? What proportion were about incompatibility? Does musical incompatibility predict leaving a relationship?

***
In the RESULTS in general, it would be great to have more letter codes in the text to help the

reader map to the figure /table. Currently, this is done sometimes but not consistently.
***

When summaries of music uses are introduced, e.g., “incorporating music into future plans” or “coping with differences”, include paraphrased example in parentheses (e.g., “planning music for a wedding”). This is done sometimes but not others.

“A more detailed heart of”
-typo, missing word “map”

***
Figure S1 - this seems like the most primary representation of the data? Is it really too busy for the main text, e.g., in place of Figure 3? It would allow the reader to see a complete code-based summary of the data in one picture. If Figure 3 is left as is, specify what the numbers that appear on the figure signify in the legend (are these as important to show as the coded data?)
***

Figure 4 legend.
-Delete “note”. This information is key to interpreting the figure. “How often” in terms of absolute number or percentage? Please specify

DISCUSSION:

“…provides an overview of how important music is at different relationship stages, by enhancing different facets of love”
-Do the data really show this? The importance data (figure 1) don’t seem to differentiate the different facets of love very well at all, other than commitment, which may have more to do with the age of the sample. Also, the case for enhancement (causal) as opposed to association, or even detriment, should be more clearly made.
***
“With stronger correlations present in individual with higher levels of musical expertise and music reward experience”
-Seems inaccurate to equate musical expertise and musical reward sensitivity? The latter appears much more strongly related (~2x)
***
“…with listening to music, sharing or discussing music, and making music together as the most common”
-Quantify. E.g., “accounting for XX% of all action codes”, or list relative proportions

“Outcomes were less frequency mentioned,”
-Quantify: percentage?

“Even though we have generated the codes purely data-driven, some parallels with Sternberg’s Triangular Theory can be drawn”
-Considering that Sternberg’s Theory is key to the theoretical framework in which this work originated, is it really surprising that some parallels are found? Seems not, especially given that data coding was guided by the researchers. I don’t take issue with the methodology, so much as this rhetoric, which doesn’t seem to reflect the facts at hand.

"Our participants also frequently mentioned feeling attracted to those with compatible music tastes".
-Quantify. How common? List percentage, or at least point to figure where the reader can quickly gauge empirical support.

***
"Simultaneously, many participants… "
-Quantify or point. I understand that the author's may not want to stick a bunch of numbers in the discussion. But the numbers / proportions need to be made more prominent somehow. Adding them to the text seems fine to me but a table will also work.
***
"… so it may be mostly musicians who report finding musical-ability attractive"
-Don't the author's have the data to address this empirically?

***
"Individual differences… BMRQ"
-This section is stands out of the lack of associated data (unless I missed it!)
-How prominent were the differences between people with high and low sensitivity to musical reward?
***
"Based on the most common outcomes … "
-List examples, percentages, etc. help the reader understand that what you're saying is accurate / representative.

"However, shared music making also emerged as a frequent activity in this phase for some participants"
-Nice qualifying point. How frequent?

***
"Contrary to our hypothesis, music was not seen as more important for enhancing commitment at this phase, according to self-report ratings"…
-Why is self-report a problem here but not for the rest of the author's data? Why doubt this result and not others… This speaks to deeper methodological concerns, e.g., "using music to enhance commitment" isn't something I'd necessarily report either, despite the fact that my partner and I always listen to music when we're hanging out (25 years in). Those musically-supported hangouts definitely bind us together, though we are not explicitly using the music to enhance commitment. Maybe the questions just aren't right.
***
LIMITATIONS

"…strengths of this study include mixed-methods design…"
-The value of qualitative data will not be obvious to many readers and should probably be explained rather than assumed (if not here, then above - sorry if I missed it.

"…large, diverse sample in terms of musical background"
-Sample not all that large for an online survey study. Also, not clear to me that the sample stands out for being diverse in musical skills. Seems like they were a very musical group (15 years playing

music/singing on average?)

“predominantly female”
-An understatement.

“highly educated”
-Do the author’s expect that this factors was relevant? Was it relevant in their data? Better to provide insight instead of simply calling this a limitation…. Or at least explain why examining these factors more seriously here doesn’t make sense (e.g., not enough males to compare with females).

CONCLUSION

“access-awareness-agency” model… strange to bring this up here having not even mentioned or described it elsewhere in the paper. Would love to see it introduced earlier and explained if it is important to contextualizing this work.

**Is the work clearly and accurately presented and does it engage with the current literature?**
Yes

**Is the study design appropriate and is the work technically sound?**
Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**
Yes

**Are all the source data and materials underlying the results available?**
Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**
Partly

**Are the conclusions drawn adequately supported by the results?**
Partly

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** Biology of music; music & health

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Author Response 22 Oct 2025

**Julia Vigl**

Dear Dr Bowling,

Thank you very much for taking the time to read our article and for providing such helpful and detailed comments, all of which we have tried to address in our revisions. We have submitted a revised version of the manuscript, which should be available online soon. Below, we summarise the issues you raised and explain how we addressed each comment, alongside the corresponding changes to the manuscript.

**Responses to general critiques:**

1. Thank you for highlighting the importance of **acknowledging the unequal gender distribution and limitations in generalizability** of our data. To address this issue, we included the percentage of female, male, and non-binary participants in the abstract, mention the sample composition at the beginning of the discussion, and expanded the 'Limitations and Future Directions' section. There, we also discuss how the results might differ with a more balanced sample composition. Regarding musical background, we would like to clarify that the average of 15 years of instrument playing refers to the 61% of participants who indicated that they play an instrument or sing, not to the total sample. In the total sample, 57% considered themselves non-musicians.
2. We appreciate the suggestion to **empirically examine the role of musical reward sensitivity in more detail**. In the revised manuscript, we have included this analysis immediately following Table 2. Specifically, we reran the ANOVA used for RQ1, adding BMRQ group (low vs. high, based on a median split) as a between-subjects factor. The results revealed a significant main effect of BMRQ, indicating that participants with higher music-related reward sensitivity reported a greater overall role of music and stronger contributions of music to the three aspects of love. No significant interactions were observed, showing that the relative pattern across love aspects and phases did not differ by BMRQ group. We have also added a figure to the OSF repository that shows boxplots for the importance of music overall and in strengthening the three aspects of love separately for the low and high BMRQ groups.
3. Thank you for highlighting the importance of **considering negative experiences of music in romantic relationships**. we have added a dedicated subsection entitled 'Negative experiences' to the qualitative results, placed after the analysis of first-order codes. This section details the frequency of negative codes overall and by phase, and identifies the most prevalent negative codes. We moved the illustrative participant quote from the first-order code description to this new subsection.

**<u>Responses to specific comments on different manuscript sections</u> Specific comments on the abstract and introduction:** We have incorporated your suggestions as follows:

- In the abstract, we have added the number of male and female participants.
- In the introduction, we clarified key concepts, such as synchrony, and explained why studying musical experiences in couples is particularly relevant from an evolutionary perspective. We also provided more information about the samples used in the cited studies (Harris et al., 2020; Harwood & Wallace, 2021). Furthermore, we rearranged two paragraphs to improve the logical flow, moving the studies on music and attraction before the study on couple-defining songs.
- Section “the present study”: We expanded the description of RQ2 to specify that we focused on musical background and sensitivity to musical reward when exploring the moderating role of individual differences. Correlations with demographic variables

were exploratory and are therefore not emphasized here (please see our next answer for more details).

**Specific comment regarding RQ2 (individual differences):** We apologise for the imprecise wording of research question 2. This research question aimed to examine whether the perceived importance of music for romantic relationships, both in general and with regard to specific aspects of romantic love such as intimacy, passion and commitment, varies across individuals, particularly in relation to musical background and sensitivity to musical reward. Investigating these associations is important for interpreting and contextualising our findings, specifically whether the role and potential benefits of music in romantic relationships are generally experienced by all individuals, or whether they are primarily experienced by those with greater musical expertise or appreciation of music. We tried to phrase this better in the section “the present study”.

**Specific comments on the methods:** Thank you for your suggestions on how to improve the Method section. We have incorporated all of them, as detailed below:

- Sample description: In the new version of the manuscript, we provide more details on the educational levels of the participants, and have clarified the overall level of musical background. In particular, we have added a statement noting the musical diversity of our sample, reordered the presentation (first noting that 57% of participants identified as non-musicians, followed by details on those who play or sing), and included further information on the distribution of individuals playing an instrument among amateur and (semi-)professional musicians.
- Measures: We added a table (now labelled Table 1 and located in the method section) showing the exact wording of the self-generated questions regarding the general role of music and its perceived contribution to intimacy, passion and commitment, alongside response labels. We also state that the survey could be completed in either German or English, with English versions of the questions available on OSF and German versions available upon request.
- Data analysis: We specify that we tested the sphericity assumption using Mauchly's test and applied Greenhouse–Geisser corrections where necessary. We also note that all analyses were conducted in RStudio and that we meant Cronbach's Alpha when mentioning “alpha” for internal consistency.
- Correlations: Following your comment regarding the correction of p-values, we have revised the correlation analyses. Table 2 (formerly Table 1) now only reports variables relevant to RQ2 and all p-values have been corrected using the Benjamini–Hochberg method. The same was applied to the tables in OSF.
- Finally, we have carefully revised the wording of the quantitative measures section in line with your suggestions.

**Specific comments on the quantitative results:** Thank you for your helpful suggestions on how to improve the analysis and presentation of our quantitative results. In response, we have made the following changes:

- Measures: We added a table (now labelled Table 1 and located in the method section) showing the exact wording of the self-generated questions regarding the general role of music and its perceived contribution to intimacy, passion and commitment, alongside response labels.
- We have rephrased the way in which we introduce the examination of individual differences, clarifying that we would like to explore whether the role of music in

romantic relationships is moderated by music-related characteristics, namely musical expertise and music-related reward sensitivity.
- We simplified Figure 1 by presenting only boxplots (rather than combining boxplots and violin plots). We also revised the figure note to explain the meaning of the jittered points and the black circles.
- Correlations (now Table 2): We revised the correlation table to include only the variables relevant to RQ2, showing correlations between the role of music and personal characteristics rather than providing a full correlation matrix. All p-values were corrected using the Benjamini–Hochberg method, yielding largely unchanged results. We now also use Spearman-correlations for all correlation tables in the manuscript and extended data. The same correction has been applied to Tables S1 and S2 in the extended data file on OSF.

**Specific comments on the qualitative results:** We really appreciate your feedback on the qualitative results, which helped us make substantial improvements. In response to your comments, we made the following changes:
- Presentation of code/theme/dimension frequency: Thank you for raising the question about how the percentages were calculated. In the original version, we reported percentages based on the proportion of all identified codes. Importantly, the results were not biased by single participants providing longer or more detailed responses, as each code was assigned only once per response, even if mentioned multiple times. Upon reflection, however, we agree that when presenting second- and third-order themes and dimensions, it is more meaningful to report the percentage of participants who mentioned each theme or dimension than the percentage of codes. This approach avoids potential inflation for themes with many similar codes and provides a clearer, participant-focused representation of the data. Accordingly, we revised the manuscript to consistently report the percentage of participants who mentioned each code, theme, or dimension. In the data analysis section, we clarified that each code was counted only once per participant per response. The overall pattern of code/theme/dimension prevalence remained largely unchanged.
- Other revisions to the qualitative results:
  - We corrected the typo noted in the review
  - We specified the two codes with the lowest inter-coder agreement.
  - We incorporated the suggested rephrasing, clarifying the concepts of connection and reconnection within the bonding dimension, adding examples to the aggregate dimension descriptions, and expanding on codes that might not be immediately clear.
  - We moved the former supplementary Figure S1 into the manuscript (now Figure 4), which now shows single-code prevalence across relationship phases.
  - We revised the description of the previous Figure 4 (now Figure 5) for greater clarity.
  - We ensured consistent inclusion of code/theme names throughout the results section.

**Specific comments on the discussion, limitation, and conclusion:** Thank you for your helpful comments on the discussion. We tried to incorporate all your suggestions, resulting in the following changes:
- We have revised the beginning of the subsection “Music across the lovespan” to avoid

overstating our findings. The revised text clarifies that our study examined participants' perceptions of the role of music, rather than demonstrating causal effects. We now emphasize that commitment was the most clearly differentiated facet and that intimacy and passion received similar ratings.
- We also clarified that the correlations between the perceived roles of music were stronger for sensitivity to musical reward than for musical expertise.
- In response to your suggestion to include absolute/relative frequencies, we added percentages to the first-order codes mentioned in the discussion. However, we refrained from adding percentages to the nine second-order themes and aggregate dimensions because these are already reported in the Results section.
- We worked to better integrate the qualitative and quantitative findings. For instance, we now discuss that some participants mentioned the importance of a partner's musical ability in the qualitative data, while the quantitative data revealed that this was more relevant for individuals with stronger musical backgrounds and greater sensitivity to musical reward.
- One comment mentioned that the section on individual differences and the BMRQ would stand out because it is not associated with any data. We would like to clarify that this section summarizes the correlational analyses conducted for Research Question 2, in which we examined the associations between musical background, sensitivity to music-related reward, and the perceived role of music in strengthening the three aspects of love across relationship phases. In response to a comment regarding the results, we added an ANOVA with BMRQ as a between-subjects factor, and we now mention this result in the discussion section as well.
- One comment suggested that we expressed concerns about using self-report data, particularly the finding that music was not considered more important for fostering commitment during the maintenance phase. We would like to clarify that we did not intend to suggest that self-report data was problematic. Instead, we contrasted the quantitative findings with the qualitative insights from the open-ended responses. This has been clarified in the revised text.
- Limitations: In addition to noting the composition of our sample as a limitation, we provided a brief discussion of how the results could have differed with a different composition of the sample, such as including more males, older individuals, or individuals who are less musically inclined. Regarding musical background, we still believe the sample was diverse, as 57% identified as non-musicians and the rest as amateur or semi-professional musicians. Please note that the average of 15 years of musical experience was calculated only for the 61% of the sample who reported playing an instrument or singing.
- As recommended, we added the value of combining the quantitative data with qualitative data in the section "the present study"
- Conclusion: We deleted the note on the access-awareness-agency model from the discussion but added a sentence about it to the introduction, discussing how it helps contextualize our research.

This concludes the changes that we made in response to your comments. We remain open to incorporation of any additional feedback you may have.

***Competing Interests:*** No competing interests were disclosed.

Reviewer Report 06 February 2025

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?

**Andrea McGraw Hunt**
Rowan University, Glassboro, New Jersey, USA

The authors conducted a thorough investigation grounded in available theory and evidence. The mixed-methods approach helped explicate the relationships between quantitative measures of musical reward, self-ratings of the importance of music during different stages of romantic relationships, and subjective personal experiences. The qualitative analysis of the open-ended responses appears to be robust and replicable. The authors also made the source data and materials publicly available, a benefit to future researchers for developing follow-up studies.

Regarding Figure 4, the code cluster for “1 Memories” is categorized as one of the Action Codes, whereas the other codes in this category describe specific actions such as “sharing” or “listening.” Does “Memories” relate to “making memories”? To me, it seems memories (and even “making” them) is more of an outcome rather than an action. If there’s another explanation, I am curious about it.

The limitations named by the authors are important. They summarized the demographic characteristics of the sample on page 5, showing the range of gender, age, nationality, and educational level. The demographic questions did not address other cultural or ethnic identities that may have impacted the responses. To check to see if such questions were asked, I looked in the source data at the code book, and discovered there that gender was reduced to a binary code for correlational analyses; the authors did not describe how they handled these data for the 4 individuals who identified as a gender other than male or female. Thus there should be more transparency and clarity for the reader, especially given the otherwise thorough statistical reporting. Regarding the limitation of selecting participants in different phases of a romantic relationship, perhaps the authors could also suggest recruiting participants involved in polyamorous relationships who may be experiencing long-term committed partnerships alongside newer relationships, and in different configurations. While this may add additional complexity to data collection, the concurrent experiences of the role of music in these relationships could provide valuable subjective reports on the different roles of music in these relationships.

Overall, this is a robust manuscript with much to offer regarding understanding ways humans engage in music experiences for social bonding. I believe it will provide a rich foundation for further study.

**Is the work clearly and accurately presented and does it engage with the current literature?**
Yes

**Is the study design appropriate and is the work technically sound?**

Partly

**Are sufficient details of methods and analysis provided to allow replication by others?**
Partly

**Are all the source data and materials underlying the results available?**
Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**
I cannot comment. A qualified statistician is required.

**Are the conclusions drawn adequately supported by the results?**
Yes

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** I am a board-certified music therapist with expertise in a wide range of qualitative and quantitative methodologies, particularly neuroscience and chronic pain. I have supervised graduate research involving survey design.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Author Response 22 Oct 2025

**Julia Vigl**

Dear Dr McGraw Hunt,  Thank you very much for taking the time to review our article, and for your positive feedback. We are glad that you appreciated our mixed-methods approach, qualitative analysis and decision to make the data openly available. We have submitted a revised version of the manuscript, which should be available online soon. Below, we summarise the issues you raised and how we addressed each comment, along with the corresponding changes to the manuscript.

1. Thank you for pointing out that the **theme '1 Memories'** could be categorised under the 'outcome' dimension rather than the 'action' dimension. During the coding process, we discussed this issue and decided to place memories in the action dimension because, compared to other outcomes that are more directly tied to emotional or relationship-related processes, we felt that recalling or creating memories functioned more as an active process that could lead to such outcomes. However, we can see how the current wording may be confusing, and therefore have added an explanation of this decision in the Qualitative Results section (right after mentioning Figure 2) and reworded the theme as '1 Making and recalling memories' in the text, figures (Figure 2, Figure 3, Figure 5), and tables (both in the manuscript and in the extended data).
2. Regarding your comment on **demographics and non-binary participants**: We agree that including questions about cultural or ethnic identity and about the type of

relationship (e.g., polyamorous relationship) could have provided valuable context, and we will bear this in mind for future surveys. As these questions were not included in our survey, we have added a new paragraph to the 'Limitations and future directions' section.

3. For gender, in the original manuscript we created a **binary variable for correlational analyses**, coding "female" versus "non-female" (including male, non-binary, and other participants). We recognise that this could be misleading as it might suggest a male–female comparison. In the revised manuscript, we have excluded the four non-binary/other participants from the gender correlations only, while retaining them in all other analyses. The R code in the extended data has been updated accordingly, and the correlation results remain largely unchanged. This approach is now reported in the Data Analysis (quantitative analysis) section.
4. Please note that Table 1 (now labelled Table 2 in the revised manuscript) has been updated in response to comments from the second Reviewer. **Rather than presenting a full correlation matrix, it now only shows the correlations relevant to answering RQ2**, with Benjamini-Hochberg corrections applied for multiple comparisons.

Thank you again for your help in improving this manuscript.

***Competing Interests:*** No competing interests were disclosed.