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The Relationship Between Depressive Symptoms and Music Preferences

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Abstract

Music is important because it can influence emotions and mood and promote social relationships. However, the question of what determines a person's music preferences, particularly in relation to mental health problems such as anxiety and depression, remains under-researched, despite the prevalence of these problems and their impact on daily life. The aim of this study was to investigate the relationship between depressive symptoms and preferences for five music preference dimensions: Intense, Classical, Contemporary, Jazzy, and Unpretentious. These five music preference dimensions comprised 17 music genres, with each music genre being categorised into the corresponding music preference dimension. The study comprised two phases: an online (n=101) and a laboratory measurement of music preferences (n=43). The participants first completed a Depression subscale (DASS-O) and rated their preferences for 17 music genres in an online survey. In the laboratory phase, a subgroup of participants from the first phase rated audio recordings of 34 music clips representing 17 music genres. In both phases of the study, depressive symptoms were positively associated with Intense music, suggesting that individuals with higher depression scores have a greater preference for Intense music (e.g., heavy metal, rock). No significant correlations were found between depressive symptoms and the other four dimensions of music preference. In addition, the participants' ratings of the music genres which they rated online differed significantly from their ratings after listening to music clips, with the participants expressing a greater preference for Classical, Intense, Jazzy, and Unpretentious music preference dimensions after listening. Gender differences were found, with men preferring Intense music and women preferring Unpretentious music. The correlation between depressive symptoms and a preference for Intense music support the assumption that music preferences, particularly Intense music genres, may reflect emotional states such as depression. The study suggests that music may play a role in understanding and coping with depressive symptoms, which in turn has implications for future research and therapeutic interventions.

Keywords: *music, music preferences, depressive symptoms, intense music*

Introduction

Music plays an important role in people's lives as it reflects their emotions, values, and conflicts while fulfilling their emotional, social, and cultural needs (Ekinci et al., 2013; Miranda & Claes, 2007). The accessibility of online music has further increased its impact on adolescents and adults (Tarrant et al., 2000). Music is also an essential part of social experiences, such as concerts, where people come together to listen to music and express their musical preferences, which can vary greatly from person to person (Vella & Mills, 2017). Furthermore, the importance of music is linked to the messages it conveys or the identification it enables, with many people viewing musical preferences as an expression of personal identity (Rentfrow & Gosling, 2003). Consequently, music has received considerable attention in cognitive psychology (Chee et al., 2024), clinical psychology (van Sprang & Haeyen, 2024), and neuroscience (Greenberg et al., 2021), but there is still a limited understanding of why people prefer certain types of music. For example, personal music preferences vary widely by genre, which may be related to personality traits (Žauhar & Levak, 2020), social identity and the sense of self (Loureiro, et al., 2024), physiological arousal (Chee et al., 2024), and other individual factors such as self-concept and cognitive ability (Rentfrow & Gosling, 2003).

The fundamental question that interested researchers was the psychological organisation of music preferences. Originally, researchers relied on music genres as a unit of measurement due to technological limitations. However, genres are poorly defined and elusive constructs that often misrepresent listeners-musical tastes (Fricke et al., 2021). To overcome these limitations, research has moved away from looking solely at music genres and focused on assessing music preferences through a careful selection of audio clips presented to participants (Rentfrow et al., 2012). Thus, Rentfrow et al. (2012) set a framework for assessing music preferences by introducing a comprehensive five-factor model called MUSIC, which includes both auditory (e.g., loud, fast, etc.) and psychological (e.g., romantic, aggressive, sophisticated, etc.) aspects of music. Furthermore, the work of Bonneville-Roussy et al. (2017) refines previous categorisations and comes closest to a compromise between a focus on musical styles and a focus on musical characteristics by providing the clearest way to develop a causal model from within a psychometrics paradigm (Hallam et al., 2009, p. 277). Their line of research based on large-scale data analysis found that preferences for musical styles can be categorised into five factors: preferences for Unpretentious, Contemporary, Classical, Jazzy, and Intense music (Bonneville-Roussy et al., 2017). Each music preference dimension includes specific music genres represented by individual music clips, and their model has similarities with the aforementioned MUSIC model by Rentfrow et al. (2012). For example, Unpretentious music is described as relaxing, slow, and romantic (e.g., soul, R&B); Classical music is artistic, complex, and intelligent (e.g., opera); and Intense music is loud, energetic, and thrilling (e.g., rock, punk, heavy metal) (Žauhar & Levak, 2020). Research by Rentfrow et al. (2012) also found that music preferences are driven by specific musical attributes and characteristics in the music (e.g., sad, complex, exciting, etc.) and that measuring participants' level of preference for individual music clips allows for a more nuanced assessment beyond genre labels as it does not require familiarity with specific music styles.

In addition to personality traits (Vella & Mills, 2017), music preferences have also been linked to internalising problem behaviours such as depression (Ekinci et al., 2013; Miranda & Claes, 2007; Ter Bogt et al., 2021b). Depression is a common and debilitating condition characterized by mood disturbances and a reduced capacity to enjoy positive experiences (anhedonia). Depressive symptoms are also associated with a pattern of stronger emotional and cognitive responses to negative stimuli and a reduction in positive emotions. Furthermore, early models of emotional dysfunction in depression emphasised the importance of inadequate physiological arousal; for example, depressed individuals show reduced and selective reactivity to positive stimuli, while negative stimuli elicit an enhanced response (Benning & Oumeziane, 2017). Therefore, when examining music and mental health problems, studies show that

music genres such as heavy metal, rap, and gothic rock can be associated with depression, self-harm, and suicidal tendencies (Ter Bogt et al., 2021b; Took & Weiss, 1994). For example, female adolescents who listen to heavy metal have shown higher levels of depressive symptoms, while pop and soul music can alleviate these symptoms. This could be due to the fact that heavy metal often contains pessimistic lyrics, while pop and soul music tend to offer more positive emotional content (Miranda & Claes, 2007). In addition, a study by Ter Bogt et al. (2021a) found that fans of all-out rock music had the highest peak levels of depressive symptoms and the lowest levels of well-being, while fans of metal music reported the most aggression. In general, music and its lyrics contribute positively to well-being by elevating mood, supporting identity formation, and providing comfort through specific and adaptive affect regulation strategies (Ter Bogt et al., 2021b; Yoon & Rottenberg, 2021). However, depressed individuals often show impaired emotion regulation and tend to rely on maladaptive strategies such as suppression, rumination, and avoidant coping when engaging with music (Kanagala et al., 2021). Furthermore, certain music preferences of individuals with depressive symptoms could reinforce these maladaptive mechanisms and therefore harm their psychological well-being (Miranda & Claes, 2008). Research by Kanagala et al. (2021) suggests that depressive symptoms are positively associated with unhealthy music use but not with healthy music use. This may be due to the fact that individuals with depressive symptoms tend to select mood-congruent music which perpetuates negative emotional states and reinforce distress rather than reduce it (Skånland, 2013). Moreover, mood congruency theory postulates that individuals are more likely to recall and engage with information that is congruent with their current affective state. In this context, negative moods might promote negative thinking and self-destructive behaviours that increase distress (Kanagala et al., 2021). Therefore, individuals with depression may listen to music that mirrors their negative emotional state due to difficulties in regulating their response to negative stimuli (Wilhelm et al., 2013). However, new evidence suggests that individuals with depressive symptoms do not select sad or low-energy music to reinforce negative mood states, but rather as an adaptive strategy aimed at relaxation, emotional calm, and emotional regulation. This suggests that music preferences in depression may serve multiple functions, including emotional self-regulation and mood modulation, rather than just the maintenance of sadness (Yoon & Rottenberg, 2021; Yoon et al., 2020).

While numerous studies have investigated the relationship between music preferences and personality traits, research establishing a link between music and mental health, including anxiety and depression, is much rarer, despite the significant burden these conditions pose (Miranda & Claes, 2007). Furthermore, the relationship between music preferences and psychiatric profiles is under-researched, and evidence is currently insufficient to establish a causal relationship between specific music genres and mental health outcomes (Ekinici et al., 2013; Kangala et al., 2021). However, the potential results of this correlational study could provide new insights into the relationship between music and mental health. Even if a causal relationship cannot be established, the results could help refine existing theories, generate hypotheses for future research, and highlight potential trends that can be investigated in experimental or longitudinal studies. Given the importance of the above findings and constructs, this study aims to determine whether there is a relationship between music preferences and depressive symptoms, more specifically, whether there is a relationship between the preference dimensions of Intense, Classical, Contemporary, Jazzy, and Unpretentious and depressive symptoms in two measurement settings (online and laboratory measurements). Based on previous research (Miranda & Claes, 2007; Ter Bogt et al. 2021a), participants with higher levels of depression should show a greater preference for Intense music. Furthermore, this study aims to examine gender differences in music preferences, with men expected to show a greater preference for Intense music compared to women (Bonneville-Roussy & Rust, 2018). In addition, this study explores potential differences between the two methods of measuring music preferences (online and laboratory settings) to determine whether the way of measurement influences participants' reported preferences.

Method

Participants

This study was conducted in two phases. The first phase included 101 participants from Croatia (24.8% male) aged between 15 and 69 years ($M = 27.71$; $SD = 11.56$). The participants were recruited as volunteers via an online invitation that encouraged them to pass the questionnaire on to others (snowball sampling system). At the end of the survey, the participants had the opportunity to take part in the second phase of the study, which included a laboratory-based measurement of musical preferences. The second phase included a subsample of 43 participants (41.9% male) from the original group who were between 15 and 69 years old ($M = 32.26$; $SD = 15.08$).

Materials

The participants completed demographic questions about their age and gender and completed the Depression Anxiety Stress Scale—DASS-O (Lovibond & Lovibond, 1995). The scale consists of 42 items and has a three-factor structure—it consists of the depression, anxiety, and stress subscales, each represented by 14 items (Reić Ercegovac & Penezić, 2012). Only the Depression subscale adapted by Reić Ercegovac and Penezić (2012) was used for this study. The reliability coefficient (Cronbach's alpha) for the depression subscale is 0.95. An example of an item is *"I felt that I had nothing to look forward to"*. The participants were instructed to respond according to how they felt in general, and responses were recorded on a 4-point Likert scale (0 = *not at all true for me* to 3 = *completely true for me*). The final score is formed as a linear combination of the ratings for each subscale, with the total score ranging from 0 to 42.

A list of 17 music genres, adapted from Bonneville-Roussy et al. (2017), was used to assess the participants' declarative, explicit preferences for specific music genres based on their labels. These genres could be categorised into five major music preference dimensions: Unpretentious, Intense, Contemporary, Classical, and Jazzy. The participants rated their preference for each genre on a 5-point scale, with 1 indicating strong dislike and 5 indicating strong preference.

In addition to the genre ratings, the participants' actual preferences were measured by rating 34 music clips, with two clips representing each of the 17 music genres. These genres were categorised into five major music preference dimensions. The clips used in this study were taken from the list of clips provided by Bonneville-Roussy et al. (2017) and Rentfrow et al. (2012) depending on availability (as their models share similarities—for example, both categorise the rock music genre under the Intense dimension). The music examples selected by the authors were instrumental and were of unknown music pieces. Both groups of authors selected music examples by consulting experts: Rentfrow et al. (2012) consulted 10 musicologists to identify representative pieces for each music genre while Bonneville-Roussy et al. (2017) asked four genre experts to curate and refine music clips to reflect the full range of each genre. The clips were 15 seconds long and normalised in volume using Audacity software. The Participants rated each clip on a scale from 1 (*"I do not like the clip at all"*) to 5 (*"I like the clip very much"*) using response sheets with an ordinal numbering system and corresponding scales for the featured clips. The reliabilities of the music preference dimensions were generally higher in the laboratory setting compared to the online setting (Table 1). The Intense dimension demonstrated the highest reliability in the laboratory ($\alpha = .92$) and remained acceptable online ($\alpha = .71$). In contrast, the Unpretentious dimension showed the greatest deviation, going from questionable reliability ($\alpha = .67$) in the laboratory to unacceptable reliability ($\alpha = .39$) online. The Contemporary dimension also showed lower reliability online ($\alpha = .58$), suggesting possible measurement inconsistencies. Additionally, the reliabilities of the music preference dimensions in this study (both online and in the labo-

ratory) follow similar trends to the study by Bonneville-Roussy and Rust (2018), with the Intense, Classical, and Jazzy dimensions having the highest reliability, and Contemporary and Unpretentious music preference dimensions having the lowest reliability.

Procedure

The study was conducted in two phases, combining online and laboratory settings to measure music preferences. In the first phase, the participants completed several online questionnaires, starting with a demographic survey, followed by a Depression subscale and finally ratings for 17 music genres. The aim of this phase was to determine the participants' declarative preferences for music genres based solely on their names. In the second phase, the participants who chose to continue were invited to the Laboratory for Experimental Psychology within a week to participate under controlled conditions. There they listened to 34 randomised audio clips, with two clips representing a specific music genre. Each clip was played once at 80% of the device's maximum volume, with enough time between clips for the participants to record their responses. The participants were not given any information about the clips other than the ordinal number, ensuring an unbiased assessment of their actual preferences for typical examples of each genre. To match the data in both phases, the participants used a unique code given to them before the study began using a template. This design allowed for a comprehensive comparison between declarative (online) and actual (laboratory based) music preferences.

Results

Preliminary Analysis

To determine whether there was a difference between the level of depressive symptoms of the participants that participated in the online measurement of music preferences ($N=58$) and those that participated in both online and the laboratory measurement ($N=43$), Mann-Whitney U test was calculated. The results of the test indicated that there was no statistically significant difference found in depressive symptoms between those that participated in online and those that participated in both online and laboratory measurement of music preferences ($z= 0.84, p= 0.40$). The effect size was small ($r= 0.08$).

Main results

The skewness and kurtosis values are relatively low in both online and laboratory settings; however, the Kolmogorov–Smirnov ($K-S$) test indicated that the depressive symptoms, as well as the scores for the online measured Classical and Intense music preference dimensions, deviated significantly from a normal distribution (Table 1). For this reason, non-parametric statistical methods were used for further data analysis (in addition to the smaller sample size for the laboratory measurement of music preferences).

Table 1

Descriptive statistics and reliability of variables used in online (N=101) and laboratory (N=43) measurement of music preferences

		<i>M (SD)</i>	<i>C (IQR)</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>K-S_d</i>	<i>p</i>	<i>α</i>
Online setting	Depressive symptoms level	8.71 (9.60)	5.00 (10.00)	1.31	0.72	0.20	<.001	0.95
	Classical	2.53 (1.09)	2.50 (1.50)	0.35	-0.71	0.13	.047	0.70
	Intense	2.50 (1.04)	2.33 (1.33)	0.59	-0.39	0.14	.039	0.71
	Contemporary	2.96 (0.96)	3.00 (1.33)	0.10	-0.54	0.10	.209	0.58
	Jazzy	2.96 (0.91)	3.00 (1.20)	0.09	-0.32	0.06	.786	0.77
	Unpretentious	3.05 (0.74)	3.00 (1.00)	0.07	0.23	0.09	.425	0.39
Laboratory setting	Depressive symptoms level	9.26 (9.60)	6.00 (12.00)	1.19	0.41	0.20	.048	-
	Classical	2.74 (0.92)	2.75 (1.25)	0.25	-0.58	0.11	.660	0.77
	Intense	3.00 (1.09)	3.00 (1.66)	-0.01	-0.74	0.10	.692	0.92
	Contemporary	3.19 (0.85)	3.33 (0.83)	-0.76	0.60	0.12	.467	0.66
	Jazzy	3.36 (0.61)	3.50 (0.90)	-0.96	0.28	0.15	.258	0.71
	Unpretentious	3.32 (0.63)	3.25 (1.00)	-0.37	-0.08	0.08	.897	0.67

Note. *C* = median, *IQR* = interquartile range, *K-S* = value of Kolmogorov-Smirnov test, *α* = Cronbach's alpha.

To investigate the relationship between the degree of depressive symptoms and the five musical preference dimensions (Classical, Intense, Contemporary, Jazzy, and Unpretentious), the Goodman-Kruskal gamma correlation coefficient was calculated (Table 2). This coefficient is particularly recommended when the data contains numerous tied ranks, as was the case in this study, where the participants rated on a 5-point scale, which increases the likelihood of multiple participants giving the same rating for certain genres (e.g., 3—*neither like nor dislike*).

Table 2

Gamma correlation coefficients between the participants' general level of depressive symptoms and five musical preference dimensions measured online (N=101) and in laboratory (N=43)

		CLA	INT	CON	JAZ	UNP							
Online setting	DSL	.03	.23**	.08	.12	-.13	Laboratory setting	DSL	.09	.24*	.19	.09	-.13
	CLA		.16*	.03	.28**	.33*		CLA		-.08	-.05	.28*	.38**
	INT			.22**	.45**	.04		INT			.26*	.10	-.22*
	CON				.19**	.02		CON				.14	-.23*
	JAZ					.44**		JAZ					.41**

Note. **p*<.05; ***p*<.01; *DSL* = depressive symptoms level, *CLA* = Classical, *INT* = Intense, *CON* = Contemporary, *JAZ* = Jazzy, *UNP* = Unpretentious.

The results show a significant, albeit small, positive correlation between the level of depressive symptoms and Intense musical preference dimension in both the online and laboratory measures of music preference (Table 2). In particular, the participants who scored higher on the depression scale also showed a greater preference for Intense music. However, no significant correlation was found between depressive symptoms and preferences for the other four music preference dimensions—Classical, Contemporary, Unpretentious, and Jazzy (Table 2).

The correlations between the music preference dimensions in the online and laboratory measures of music preferences are reasonably similar, although notable differences were found. Significant positive

correlations were found between the Classical, Jazzy, and Unpretentious music preference dimensions, as well as between the Intense-Contemporary and between Jazzy-Unpretentious music preference dimensions in both the online and laboratory measures of music preference (Table 2). These correlations were low to medium.

In the online measurement, however, additional small positive correlations were observed between the Classical and Intense preference dimensions, as well as between Contemporary and Jazzy and a medium correlation between Jazzy and Intense music (Table 2). These correlations were not present in the laboratory measurement of music preferences. Interestingly, in the laboratory measurement, the Intense and Contemporary music preference dimensions were negatively correlated with the Unpretentious music preference dimension (Table 2), suggesting that the participants who preferred Unpretentious music showed a lower preference for Intense and Contemporary music.

Additional analyses were also conducted to explore potential gender differences and discrepancies between the two methods of measuring music preferences (online and in the laboratory).

Additional Analyses

Moreover, Wilcoxon matched pairs test was conducted to compare the participants' declarative ratings of the music preference dimensions (online) with their ratings after listening to music clips (laboratory phase) ($N=43$) (Table 3). Additionally, gamma correlation coefficients have been calculated between declarative and listened ratings of musical preference dimensions for the subsample ($N=43$) (Table 4).

Table 3

Results of Wilcoxon matched pairs test between declarative and listened ratings of musical preference dimensions ($N=43$)

	Declarative preferences		Listening preferences		<i>z</i>	<i>p</i>	<i>r</i>
	<i>M</i> (<i>SD</i>)	<i>C</i> (<i>IQR</i>)	<i>M</i> (<i>SD</i>)	<i>C</i> (<i>IQR</i>)			
CLA	2.26 (0.86)	2.50 (1.50)	2.74 (0.92)	2.74 (1.25)	3.87	<.001	0.66
INT	2.55 (1.14)	2.33 (1.67)	3.00 (1.09)	3.00 (1.67)	3.35	<.001	0.54
CON	3.14 (0.99)	3.00 (1.67)	3.19 (0.85)	3.33 (0.83)	0.63	.528	0.10
JAZ	3.01 (0.89)	3.20 (1.40)	3.36 (0.61)	3.50 (0.90)	3.31	<.001	0.52
UNP	2.91 (0.72)	3.00 (1.00)	3.32 (0.63)	3.25 (1.00)	4.38	<.001	0.69

Note. *C* = median, *IQR* = interquartile range, *r* = Rosenthal's effect size, *CLA* = Classical, *INT* = Intense, *CON* = Contemporary, *JAZ* = Jazzy, *UNP* = Unpretentious.

A statistically significant difference was found between the declarative ratings and the ratings after listening to the clips for the Classical, Intense, Jazzy, and Unpretentious preference dimensions. Classical and Unpretentious music preference dimension showed the most pronounced difference with a large effect size, while the Intense and Jazzy music preference dimensions showed a significant difference with a moderate effect size (Table 4) according to Bartz (1999, p.184). In these cases, the participants expressed a higher level of liking for the music preference dimensions after listening to the clips compared to their initial declarative ratings (Table 3).

Table 4

Gamma correlation coefficients between declarative and listened ratings of musical preference dimensions (N=43)

Music dimension	<i>r</i> (listened vs. declarative rating)
Classical	.62**
Intense	.65**
Contemporary	.57**
Jazzy	.65**
Unpretentious	.59**

Note. ** $p < .01$

The results show strong correlations between all five dimensions of music preference based on listening behaviour and the participants' declarative ratings, with the Intense and Jazzy dimensions being the most strongly correlated. This suggests that, despite significant differences between the declarative and listened ratings for four of the music preference dimensions (Table 4), the participants are consistent in their preferences as their preferences follow a similar trend regardless of the method of measurement (Table 4).

Mann-Whitney U tests were conducted to investigate gender differences in music preference ratings in the five dimensions of music preference, both online and in the laboratory (Table 5).

Table 5

Mann-Whitney U test results of gender differences in the participants' ratings for each of the five musical preference dimensions in online (N=101) and laboratory (N=43) setting

Online setting							
	Men (N=25)		Women (N=76)				
	<i>M</i> (<i>SD</i>)	<i>C</i> (<i>IQR</i>)	<i>M</i> (<i>SD</i>)	<i>C</i> (<i>IQR</i>)	<i>z</i>	<i>p</i>	<i>r</i>
CLA	2.18 (0.96)	2.00 (1.00)	2.64 (1.11)	2.50 (2.00)	1.84	.063	0.18
INT	2.91 (1.15)	3.00 (1.67)	2.36 (0.97)	2.33 (1.33)	-2.02	.042	-0.20
CON	3.24 (0.88)	3.00 (1.67)	2.86 (0.98)	2.67 (1.17)	-1.48	.136	-0.15
JAZ	2.87 (0.98)	3.00 (1.80)	2.98 (0.89)	2.90 (1.20)	0.26	.798	0.03
UNP	2.64 (0.70)	2.50 (1.00)	3.19 (0.71)	3.25 (0.75)	2.93	.003	0.29
Laboratory setting							
	Men (N=18)		Women (N=25)				
	<i>M</i> (<i>SD</i>)	<i>C</i> (<i>IQR</i>)	<i>M</i> (<i>SD</i>)	<i>C</i> (<i>IQR</i>)	<i>z</i>	<i>p</i>	<i>r</i>
CLA	2.40 (0.69)	2.50 (0.75)	2.98 (1.00)	3.00 (1.50)	2.08	.036	0.32
INT	3.43 (1.01)	3.33 (2.00)	2.69 (1.05)	2.83 (1.67)	-2.08	.037	-0.32
CON	3.27 (0.68)	3.33 (0.67)	3.13 (0.97)	3.33 (1.00)	-0.02	.980	-0.00
JAZ	3.28 (0.71)	3.40 (1.00)	3.41 (0.55)	3.60 (0.80)	0.49	.622	0.08
UNP	2.96 (0.60)	3.00 (0.50)	3.58 (0.52)	3.75 (0.88)	3.05	.002	0.47

Note. *C* = median, *IQR* = interquartile range, *r* = Rosenthal's effect size, *CLA* = Classical, *INT* = Intense, *CON* = Contemporary, *JAZ* = Jazzy, *UNP* = Unpretentious.

The online measurement revealed significant differences in the Intense and Unpretentious dimensions. Men reported significantly higher preferences for Intense music, whereas women rated Unpretentious music significantly higher. The effect sizes were small ($r = -0.20$ and 0.29) (Table 5).

In the laboratory measurement, significant gender differences were observed for Classical, Intense, and Unpretentious dimensions. Women indicated significantly higher preferences for Classical and Unpre-

tentious music, while men had a higher rating for Intense music. The effect sizes were small ($r = \pm 0.32$) to moderate ($r = 0.47$) (Table 5).

The results indicate gender differences in music preferences, with stronger effects observed in the laboratory setting compared to the online setting, particularly for Unpretentious music (Table 5).

Discussion

One of the aims of this study was to determine whether there is a relationship between depressive symptoms and preferences for the five dimensions of music preference: Intense, Classical, Contemporary, Jazzy, and Unpretentious. The same participants rated their music preferences in two phases of the study, and the results showed that the Intense music was positively associated with depressive symptoms in both the online and laboratory measurement of music preferences. However, no significant correlations were found between depressive symptoms and the other four music preference dimensions (Classical, Contemporary, Jazzy, and Unpretentious). As no differences in depressive symptoms were found between the participants in the online and laboratory measurements, it is unlikely that the differences in depression scores influenced the observed differences in music preferences in the two settings.

The relationship between depressive symptoms and a preference for Intense music obtained in this study supports the hypothesis that individuals with higher levels of depression are more likely to prefer Intense music, a finding that is consistent with the study by Ter Bogt et al. (2021a) and Miranda and Claes (2007). In their study, adolescent girls' preference for heavy metal music was found to be associated with increased depressive symptoms, while preference for soul and pop music was associated with lower levels of depression. According to their interactive influence perspective, individuals may initially gravitate towards music styles that resonate with their emotional state, with genres such as heavy metal, punk, and rock—characteristic of the Intense preference dimension—conveying negative, despairing messages that may increase depressive feelings. Conversely, genres such as soul and pop, with their uplifting melodies and comforting lyrics, can help to alleviate depressive symptoms. An alternative explanation for these findings could be found in early models of physiological underarousal in depression (Grossberg, 1972). According to the low positive emotion model, depressed individuals respond less strongly to pleasant stimuli, while the elevated negative emotion model states that they respond more intensely to negative stimuli (Benning & Oumeziane, 2017). It is possible that people with depression respond more strongly to the negative emotions expressed in Intense music genres such as heavy metal, rock, and punk, which emphasise aggression, despair, and loss, while responding less to the positive emotional cues offered by genres such as soul and gospel in the Unpretentious music preference dimension, which tend to be more soothing and romantic (Rentfrow & Gosling, 2003). In addition, individuals with depressive symptoms often have problems with emotion regulation and rely on maladaptive strategies such as rumination and avoidance when engaging with music (Kanagala et al., 2021). According to mood congruency theory, they are more likely to select music that reflects their current emotional state, which may exacerbate rather than alleviate stress (Skånland, 2013), contributing to the findings that depressive symptoms are associated with unhealthy music consumption, as individuals with depression listen to music that sustains negative emotions rather than adaptively regulating them (Kanagala et al., 2021). This may explain why the participants with higher depressive symptoms showed a stronger preference for Intense music genres such as rock, heavy metal, and punk, as these genres often convey themes of anger, sadness, and emotional intensity that are consistent with their affective state (Miranda & Claes, 2008).

Regarding the associations between the music preference dimensions, the results showed that Classical music was positively correlated with Intense, Unpretentious, and Jazzy music and that Intense music

was positively associated with Contemporary music. In addition, a positive correlation was found between Jazzy and Unpretentious music. Greasley and Lamont (2006) found through interviews that social interactions and environmental changes significantly influence music preferences, suggesting that preferences are not static but evolve over time. Music is made up of different attributes such as tempo, rhythm, and emotional tone, and individuals may prefer certain musical characteristics regardless of genre. For example, some people are attracted to sad or instrumental music regardless of whether it belongs to the rock, classical, or jazz genre (Rentfrow et al., 2012). Consequently, music preferences may not be limited to specific genres, but reflect a broader attraction to certain musical qualities, such as energy or emotional depth, which may be present in multiple genres. Interestingly, results from laboratory measures of music preferences have shown that the Intense and Contemporary music preference dimensions were inversely correlated with the Unpretentious music preference dimension. This finding is consistent with previous research by Bonneville-Roussy and Eerola (2018), who found that genres within the Unpretentious preference dimension (such as country, pop, and gospel) contrast strongly with genres within the Intense (e.g., punk, heavy metal) and Contemporary (e.g., electronic, hip-hop) preference dimensions. The contrasting characteristics of these genres—ranging from the melodic, simple patterns of Unpretentious music to the loud, distorted qualities of Intense music—suggest that these preference dimensions appeal to different emotional experiences (Bonneville-Roussy et al., 2017). The lack of similar results in the online phase of the study may be due to the use of genre-based measures, which may not have fully captured the participants' nuanced preferences for certain musical attributes.

Furthermore, this study aimed to investigate potential differences between the two methods of measuring music preferences (online and laboratory settings) to determine whether the type of measurement influences the preferences stated by the participants. Significant differences were found between the participants' declarative preferences (online measurements) and their ratings after listening to music clips (laboratory measurements) for the Classical, Intense, Jazzy, and Unpretentious preference dimensions, suggesting that listeners may be influenced by the specific characteristics of the music itself rather than by preconceived assumptions about music genres. This observation is consistent with research findings by Bonneville-Roussy and Rust (2018), which suggest that social influences are more likely to shape genre preferences, while preferences for actual music clips may be less influenced by external factors such as stereotypes or social desirability. This suggests that music clips, as opposed to declarative broad music genres, provide a more direct measure of individual preferences without the influence of social or cultural associations.

In addition, this study also aimed to examine gender differences in music preferences. Gender differences were found, with men preferring Intense music more than women, and women showing a stronger preference for Unpretentious music. This is consistent with previous research, suggesting that women tend to prefer softer, more vocal and melodic music (e.g., soul, R&B, pop), while men show a greater preference for harder, more aggressive music genres such as heavy metal and rock. These types of gender differences in music preferences have been documented since adolescence and persist into adulthood (Bonneville-Roussy & Rust, 2018).

Limitations and Suggestions

A potential limitation of the current study is the use of a music preference model that may be more appropriate for English-speaking populations (Bonneville-Roussy et al., 2017; Rentfrow et al., 2012) and may not fully capture music genres that are more prevalent in the Croatian context, such as turbofolk (Žauhar & Levak, 2020). In addition, the relatively small sample size limits the significance of the results. Another limitation is that the participants were not explicitly asked about their familiarity with the music

clips, meaning that familiarity was assumed rather than measured, which may have influenced their stated preferences.

Future studies could address these limitations by including a broader range of music genres relevant to the Croatian context. In addition, increasing the sample size would improve the reliability and generalisability of the results. To better control for the influence of familiarity, participants in future studies should also indicate whether they recognise the music clips presented in the study.

However, the two-phase design used in this study may have helped to alleviate some of these limitations by providing a more accurate representation of the relationship between depressive symptoms and music preferences. The combination of online surveys with controlled listening tasks in the laboratory may have improved the reliability of the data and reduced potential biases. These strengths allowed the study to explore the relationship between depressive symptoms and music preferences, particularly in relation to the Intense music preference dimension, which includes genres such as heavy metal, rock, and punk. Although a low positive correlation was found, the results are preliminary and should be interpreted with caution due to the limitations of the study. However, the results suggest that music may play a role in reflecting or enhancing emotional states in individuals with depressive symptoms. Future research is needed to further investigate these relationships and explore the potential of music-based interventions for individuals with depressive symptoms.

Conclusion

The study observed a small positive correlation between the level of depressive symptoms and preference for Intense music in both online and laboratory setting—the participants who scored higher on the depression scale also showed a greater preference for Intense music. The participants' music preferences were generally consistent across declarative and listening-based measures, though they showed a stronger preference for Classical, Intense, Jazzy, and Unpretentious music after listening (laboratory setting). Gender differences were also observed in both phases of the study—in the online setting, men preferred Intense music more than women, who favoured Unpretentious music, whereas in the laboratory setting, men also favoured Intense music more than women, who showed a greater preference for the Unpretentious, as well as for the Classical music.

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