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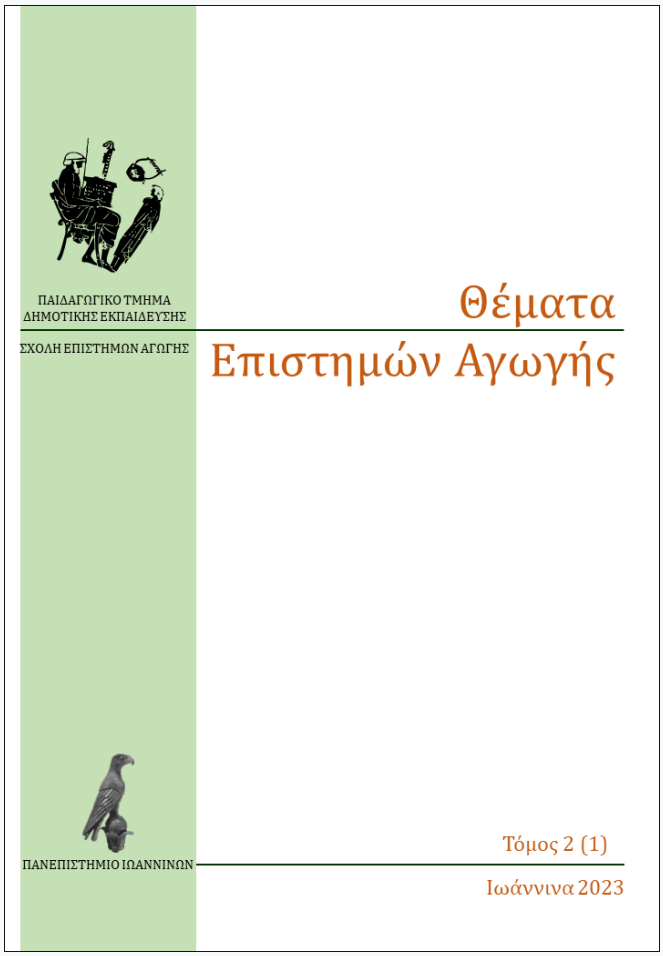

Music listening as an emotion regulation strategy of university-students during COVID-19 lockdown

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Music listening as an emotion regulation strategy of university-students during COVID-19 lockdown

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Abstract. The purpose of the current study was to examine the impact of positive music listening experience and musical emotion regulation strategies as predictors of university-students' affect during COVID-19 lockdown. Two hundred and three undergraduate students completed an on-line self-report questionnaire consisting of Positive Music Listening Experience Scale, Music Uses and Gratifications Scale, Positive and Negative Affect Schedule. Results indicate that students' positive affect is positively related with positive music listening experience as well as with negative mood management, whereas negative affect is negatively related with negative mood management. Furthermore, positive music listening experience was the only predictor of positive affect, while both emotion regulation strategies were predictors of negative affect. Results indicate the importance of music listening as an emotion regulation strategy of students during pandemic. The practical applications and limitations of the research are discussed.

Key-words: COVID-19, emotion regulation strategies, music listening, positive affect, negative affect, university-students

Η μουσική ως στρατηγική ρύθμισης του συναισθήματος του φοιτητικού πληθυσμού στη διάρκεια της απαγόρευσης της κυκλοφορίας λόγω του COVID-19

Περίληψη. Σκοπός της παρούσας μελέτης ήταν να εξετάσει την επίδραση της θετικής εμπειρίας μουσικής ακρόασης, καθώς και τις στρατηγικές ρύθμισης του συναισθήματος μέσω της μουσικής ως προγνωστικούς παράγοντες του συναισθήματος του φοιτητικού πληθυσμού κατά τη διάρκεια της απαγόρευσης της κυκλοφορίας λόγω του COVID-19. Διακόσιοι τρία άτομα από προπτυχιακό φοιτητικό πληθυσμό συμπλήρωσαν διαδικτυακό ερωτηματολόγιο αυτοαναφοράς, αποτελούμενο από τις κλίμακες: Positive Music Listening Experience Scale, Music Uses and Gratifications Scale, Positive and Negative Affect Schedule. Τα αποτελέσματα έδειξαν ότι το θετικό συναίσθημα του φοιτητικού πληθυσμού συσχετίζεται θετικά με τη θετική εμπειρία μουσικής ακρόασης, καθώς και με τη διαχείριση της αρνητικής διάθεσης, ενώ το αρνητικό συναίσθημα συσχετίζεται αρνητικά με τη διαχείριση της αρνητικής διάθεσης. Επιπλέον, η θετική εμπειρία μουσικής ακρόασης ήταν ο μοναδικός προγνωστικός παράγοντας του θετικού συναισθήματος, ενώ και οι δύο στρατηγικές ρύθμισης του συναισθήματος ήταν προγνωστικοί παράγοντες του αρνητικού συναισθήματος. Τα αποτελέσματα αναδεικνύουν τη σημασία της μουσικής ακρόασης ως στρατηγικής ρύθμισης του συναισθήματος του φοιτητικού πληθυσμού κατά τη διάρκεια της πανδημίας. Συζητούνται οι πρακτικές εφαρμογές και οι περιορισμοί της έρευνας.

Λέξεις κλειδιά: COVID-19, στρατηγικές ρύθμισης του συναισθήματος, μουσική ακρόαση, θετικό συναίσθημα, αρνητικό συναίσθημα, φοιτητικός πληθυσμός

Introduction

A substantial number of recent studies have aimed to examine university-students' well-being as related to the pandemic specific circumstances (e.g., Ballester-Ferrer et al., 2022; Krautter et al., 2022; Plakhotnik et al., 2021). In this context, there is additional data to support negative impact of COVID-19 pandemic on students' mental health and affect. For example, obsession, anxiety, and fear were identified in the questionnaires administered to approximately 500 university-students in China, resulting from conditions such as challenges of remote learning and home quarantine (Jiang, 2020). Fear of the coronavirus was mentioned to result in stress, while psychological trauma and harmful effects were expected as outcomes of physical distancing measures and economic problems (Lange & Sun, 2022). Among other findings, depression symptoms were highly rated by the majority of students participating in the study of Sun et al. (2021).

Similar findings about the psychological effects of COVID-19 pandemic can be found in surveys conducted on university students in different countries. Mild to severe generalized anxiety disorder was demonstrated in 65% of the students and high level of perceived stress in 56% of the students in a sample of 914 students participating in the study of Rogowska et al. (2020) administered in Poland. Related supporting findings were also revealed in a British study held by Gadi et al. (2022). Specifically, the levels of five distinct emotions including sadness, irritability, fatigue, frustration, and loneliness, were investigated. Most commonly, each of those emotions appeared to be increased, while more than half of the students were mentioned to experience feelings of anxiety, stress, worry, irritability, fear, and difficulty relaxing (Gadi et al., 2022). A quantitative study administered in China revealed that university students classified their perceived stress and anxiety levels as moderate (Adjepong et al., 2022). Increased levels of depression, anxiety, stress, and negative affect were found by Kornilaki (2022) on university students in Greece. Such findings could formulate an argument towards an increasingly negative impact of Covid-19 related conditions to university-students' affect, or an admission that "university life is at least moderately stressful" (Adjepong et al., 2022, p.4).

Emotion regulation is one of the most widely developed area in psychological research (Tull & Aldao, 2015) and refers to the processes that modify the frequency, intensity, and duration of emotional states (Gross, 2015) to function adaptively (Beauchaine & Cicchetti, 2019). When people are asked about their emotion regulation, they usually describe their efforts to down-regulate negative emotions, such as anger, sadness, and anxiety (Gross et al., 2006) or to up-regulate positive emotions, such as love, interest, and joy (Quoidbach et al., 2010). Gross and John (2003) proposed two main emotion regulation strategies: *cognitive reappraisal,* which is associated with positive behavioral, emotional, and cognitive outcomes and *suppression,* which is related to negative and maladaptive adjustment. Emotion regulation not only reinforces psychological health and well-being, but also helps to deal with negative life events and stress (for review, see Kobylińska & Kusev, 2019). The ability to regulate emotions' experience and expression, within challenging situations, is fundamental for healthy development across the lifespan (Zeman et al., 2006).

Researchers have been increasingly interested in the effect of music upon emotions for decades (Gross, 1998; Juslin & Lakka, 2004; Sloboda & O'Neil, 2001; Uhlig et al., 2013). Although feelings through music are reported to vary among individuals (Baltes & Miu, 2014), the psychological response to rhythm is viewed as a universal human experience (Zentner &

Scherer, 2008). Particularly, a substantial amount of research has revealed that music listening may enhance the development of pleasant emotions like excitement, relaxation, calmness, affection, and satisfaction (Juslin et al., 2008; Juslin & Laukka, 2004; Maksimainen & Saarikallio, 2015), esthetic enjoyment, like beauty (Istók et al., 2009) and ultimate experiences, like surprise, desire, sensuality, power, or exceedance (Zentner & Scherer, 2008). Accordingly, a number of recent studies reported that musical therapy sessions may take effect as beneficial interventions because they increase positive affect and reduce negative affect (e.g., Fredenburg & Silverman, 2014).

Concurrently, music listening can be employed as a tool for emotion regulation, as some individuals choose music in order to reduce negative emotions (Getz et al., 2012) and high levels of stress (Getz et al., 2012; Vella & Mills, 2017) or even to reduce their negative moods and increase their positive moods (Lonsdale & North, 2011). From a biological perspective, slow, meditative music is expected to reduce stress by adjusting heart rate, a part of the different natural body rhythms (Bernardi et al., 2006; Bringman et al., 2009; Chlan, 2000; Hilz et al., 2014; Nomura et al., 2013; Thaut & Hoemberg, 2014). Pursuing this further, evidence supports the use of music as a means to manage emotions (Allen et al., 2009; Juslin et al., 2014; Juslin & Laukka, 2004; Sloboda & O'Neill, 2001). Indicatively, music is thought to have a positive impact on long term mood disorders like depression (Miranda & Claes, 2009; Miranda et al., 2010). Ter Bogt et al., (2017) claimed that adolescents with anxious and depressive behavior are more likely to look for comfort through music. Further, young adults often turn to music in response to their feelings of anger or in an effort to vent their emotions (Labbé et al., 2007; Sharman & Dingle, 2015). In a recent study involving university-students, (Cook et al., 2019) certain types of music were able to determine the result of emotional regulation.

As the COVID-19 pandemic offered a unique opportunity to study individual strategies to a collective stressor, there are several studies which examined how people used music to regulate their emotions effectively in response to this situation (Hennessy et al., 2021). For example, people in Spain dedicated to musical activities during the lockdown to cope, and declared that music listening helped them relax, escape, and raise their mood (Cabedo-Mas et al., 2021). Hennessy et al. (2021) examined in an online survey if people from four different countries (Italy, United Kingdom, United States, and India) used music to manage their emotions and found that there was a positive relationship between the use of music listening for affect regulation and current well-being, particularly for participants from India. Furthermore, another online research conducted by Granot et al. (2021) in 11 different countries found that music was remarkably effective at expressing negative emotions and retaining good mood, across cultures. In a sample consisting of 402 domestic and international university-students in Australia, it was found that strategies such as music listening were effective under the circumstances of a pandemic, as they were related positively with well-being (Vidas et al., 2021). Additionally, in a survey with over 700 students in Canada music was rated in the top spots for maintaining well-being and 52% of the participants indicated or consider participating in music therapy classes (Finnerty et al., 2021).

While research in Greece has examined how university-students experienced online education (Giannoulas, et al., 2021) and the psychological consequences of the pandemic on them (Kornilaki, 2022), very little evidence exists about how students regulated their negative emotions and whether they did use music as a strategy to regulate them. Therefore, the purpose of the current study was to examine the impact of positive music listening experience and musical emotion regulation strategies as predictors of university-students' affect during COVID-19 lockdown and to explore the potential distinctive influences of different sources of emotion regulation on students' affect as well.

We formulated the following hypotheses:

1. Positive music listening experience and musical emotion regulation strategies will be correlated positively with students' positive affect and negatively with negative affect.

2a. Positive music listening experience and musical emotion regulation strategies will be identified as positive predictive factors of students' positive affect.

2b. Positive music listening experience and musical emotion regulation strategies will be identified as negative predictive factors of students' negative affect.

Method

Participants and procedure

Participants were 203 undergraduate students. More specifically, they were 173 (85.2%) women and 27 men (13.3%). Their average age was 24.97 years old (*SD*= 8,80). The study was conducted in October 2021, when students returned to university after the country's lockdown due to the COVID-19 pandemic. For the purpose of the study, we created a comprehensive online questionnaire. The survey was promoted through social media so that we could recruit enough students. Participants were provided with an electronic form describing the objective of the study and the confidential nature of their participation. In addition, the form elaborated on issues of protection of privacy and ethics, and provided contact details of the first author. Participants were asked to confirm that they had read the form and that they were willing to participate in the study. Upon receipt of this confirmation, they were directed to the questionnaires described below. Students were asked to respond to all the answers, while they were informed participation would be anonymous.

Measures

The impact of music listening was measured by the Positive Music Listening Experience Scale (*PMLES*; Chang et al., 2021). The PMLES consists of one item on the frequency of intentional listening to music and 14 items regarding the effects of this listening on (1) coping, for example "Helps me to better cope with worries", (2) solitude, for example "I Prefer to do alone", and (3) contemplative experience, for example "Gives me a sense of beauty that nothing else can". These comprised three subscales, respectively. The total PMLES score was estimated by adding all 15 items. The score for the 15 items ranges on a five-point Likert-type scale from 1 (not at all or never) to 5 (very much or very often). In the current study, Cronbach's was α = .94.

Musical emotion regulation strategies were measured by two subscales from the 48-item Music Uses and Gratifications scale by Lonsdale and North (2011). The scale includes eight subscales, each with six items, measuring additional reasons for listening to music that are less affective in nature (all subscales had good internal consistency; $\alpha \geq .74$). For the purpose of this research only two subscales were used. Specifically, the first related to positive mood management, where music is used to entertain and create positive moods, and the second related to negative mood management, where music is used to alleviate negative feelings and to enhance mood. Both subscales have been previously employed in a similar recent study (Cook et al., 2019). Participants were asked to rate the extent to which each statement accurately described why they listened to music, and responses were measured on an 11-point scale (0 = not at all, 10 = completely). Examples of the questions are: "I hear music as a relief from stress (negative mood management)" or "I hear music to feel better (positive mood management)". In the current study, the Cronbach's for these two subscales were $\alpha \geq .73$.

Positive and negative trait affect was measured by Positive and Negative Affect Schedule (*PANAS*; Watson et al., 1988). The PANAS is a 20-item self-report instrument that consists of two affect scales (10 items each), positive trait affect and negative trait affect. Each scale is measured by a 5-point Likert-type scale ranging from 1 (very slightly or not at all) to 5 (extremely). Participants were asked to indicate the extent to which they have had a certain feeling over the past week (for example: interested, excited, guilty, scared). Some examples of the questions are the following: "Indicate the extent you feel enthusiastic right now" or "Indicate the extent you feel disappointed right now". In the current study, Cronbach's was α= .849 for positive affect and α= .840 for negative affect.

Results

According to the answers (Table 1), there were high levels of positive music listening and musical emotion regulation strategies and students' positive affect while there were low levels of students' negative affect.

Table 1. Mean and standard deviation of the variables

Variables	*M*	*SD*
Positive Music Listening[a]	3.68	.76
Positive Mood Management[b]	7.41	1.91
Negative Mood Management[b]	8.61	1.58
Positive Affect[c]	3.14	.94
Negative Affect[c]	1.85	.86

Note. [a]*Scale 1-5,* [b]*Scale 1-10,* [c]*Scale 1-5.*

In order to examine the relationship between positive impact of music listening, musical emotion regulation strategies and students' affect during the pandemic of COVID-19, Pearson correlation coefficient r was calculated (Table 2). In terms of positive affect, a positive moderate correlation was found with positive impact of music listening $r(201) = .27$, $p < .01$, as well as with negative mood management $r(201) = .25$, $p < .01$, whereas in terms of negative affect, a negative moderate correlation was found only with negative mood management $r(201) = -.14$, $p < .05$.

Table 2. Correlation between variables

Variables	1	2	3	4	5
Positive music listening	-				
Positive mood management	.43**	-			
Negative mood management	.40**	.59**	-		
Positive affect	**.27****	.11	**.25****	-	
Negative affect	.06	.04	**-.14***	-.02	-

*Note. 1. Positive music listening, 2. Positive mood management, 3. Negative mood management 4. Positive affect, 5. Negative affect. *p < .05, **p < .01*

Moreover, a multiple regression analysis was performed, with students' positive affect as the dependent variable and both positive impact of music listening and musical emotion regulation strategies as predictors (Table 3). The resulting model was statistically significant (F =8.03, df = 3, p <.05) and explained 33% of the variance (R^2 = .03) of students' positive affect. Of the 3 predictor variables participating in the model, only positive impact of music listening emerged as statistically significant.

Table 3. Multiple regression analysis for predicting positive affect by music listening and musical emotion regulation strategies

Predictors	B	Std. Error	Beta	t	Sig.
(Constant)	1.36	.39		3.45	.00
Positive music listening	**.29***	.09	.23	3.08	**.00**
Positive mood management	-.07	.04	-.13	-1.56	.12
Negative mood management	.14	.05	.24	2.79	.01

*Note. *p < .0,5 **p < .01*

Afterwards, a multiple regression analysis was performed with students' negative affect as the dependent variable and both positive impact of music listening and musical emotion regulation strategies as predictors (Table 4). The resulting model was statistically significant (F =3.92, df = 3, p <.01) and explained 56% of the variance (R^2 = .06) of students' negative affect. Of the 3 predictor variables participating in the model, musical emotion regulation strategies, thus positive mood management and negative mood management, emerged as statistically significant.

Table 4. Multiple regression analysis for predicting negative affect by music listening and musical emotion regulation strategies

Predictors	B	Std. Error	Beta	t	Sig.
(Constant)	2.22	.37		5.95	.00
Positive music listening	.11	.09	.09	1.22	.22
Positive mood management	**.08***	.04	.18	2.00	**.05**
Negative mood management	**-.16****	.05	-.29	-3.31	**.00**

*Note. *p < .05, **p < .01*

Discussion

The purpose of the current study was to examine music listening and musical emotion regulation strategies as predictors of university-students' affect during COVID-19 lockdown and to explore the potential distinctive influences of different sources of emotion regulation on their affect as well. In regard with Hypothesis 1, it was found that students' positive affect was positively related with positive music listening experience as well as with negative mood management, while students' negative affect was negatively related with negative mood

management. These findings are in line with previous research indicating that music listening enhances pleasant emotions (Juslin et al., 2008; Juslin & Laukka, 2004; Maksimainen & Saarikallio, 2015) and explaining why individuals use music as a tool to regulate their negative emotions (Getz et al., 2012; Vella & Mills, 2017). Results extend the emotion regulation theory about adaptability of emotional states (Beauchaine & Cicchetti, 2019; Gross, 2015). Furthermore, from the field of psychoanalysis, music-listening has been reported to open space for people to connect to their own life stories and to show greater acceptance for disruptive phases e.g., the death of a loved one (Storr, 1992). This has also been reported to coincide with greater demand for music-listening. This might allow us to expect that participants who scored higher on the first PMLES item would show greater acceptance to the disruptive effects of the pandemic and the restricting policies that followed it.

Moreover, the impact of positive music listening experience was a positive predictor of students' positive affect (Hypothesis 2a), while positive mood management and negative mood management were negative predictors of students' negative affect (Hypothesis 2b). These findings suppose that students who listen to the music have increased levels of positive affect, while students who listen to the music either to feel better or to find relief from stress have reduced levels of negative affect. Therefore, the present findings are in line with previous ones proposing that music as an emotion management tool can operate as a positive relaxation factor and lighten negative emotions (Shifriss et al., 2015). Music-listening has also been linked to increased levels of imagination deployment (Hess, 2021), which is in turn associated with problem-solving abilities (McFarland et al., 2017). Intentional music-listening and the effects it has on negative emotion management could be seen as prospective problem-solving, where the problem is the changes brought about by the pandemic and thus protect the listener from feelings of helplessness.

In the face of the pandemic, where people had to make drastic changes in their everyday habits, routines and ways of socialization, music-listening helped them face and metabolize the hardship that came with uncertainty and anxiety due to the invisible enemy (Finnerty et al., 2021). Given that emotion regulation is fundamental during challenging situations of human life (Zeman et al., 2006), present findings propose that adaptive strategies such as music listening can help people deal with negative life events like COVID-19 pandemic. Building on from this, the use of music as a tool for psychological well-being can be generalized outside the strict context of the pandemic and the changes in social habits that followed.

The present study reveals a general trend towards the beneficial results of exposure to music. Given that the findings concern university students in emerging adulthood (Arnett, 2000, 2012) and that emerging adults spend most time on the internet and listening to music (Coyne et al., 2016), it seems that music could not be taken as the predictor of mental health for general population. Music listening is already used as a therapeutic tool for mental health problems, and this provides a solid basis for assuming that the introduction of music therapy to universities could be a promising field for the promotion of mental health well-being among students. Further research is needed, as well as meticulous planning and careful implementation. Drawing from research on assisted vs. self-guided mental health interventions, on the other hand, a general tendency for the greater effects of the former can be seen (Fischer et al., 2020). Bringing these together, we could formulate the basis for a common ground between the two. A class or workshops where students are taught the importance of musical characteristics like timbre and tempo, how they help shape musical experience and how we could use them as targets for channelling and changing our mood (e.g., Swaminathan & Schellenberg, 2015) could be suggested as an idea for improving the mental well-being of students around the globe.

In general, our research indicates positive music listening experience and musical emotion regulation strategies as important factors to predict university-students' affect during a global crisis experienced at the same time by large populations and suggests a general trend for students' mental well-being. Nevertheless, the present study has some limitations. The cross-sectional design and the small number of participating students do not permit the generalisation of the findings. Future studies with longitudinal design and more participants are needed to permit causal inferences among these variables. Of course, local, and culture-specific ways of interpreting musical characteristics would have to be taken into consideration (Ryczkowska, 2022). The lack of such explorations can be considered as another limitation of our research. Our study also brings to light the importance of listening to self-selected music. Future qualitative research could also include students' interviews to examine in-depth factors that bring the focus into the act of selecting music with certain characteristics such as timber, tempo, tone (McAdams & Giordano, 2015; Siedenburg et al., 2016) to mirror and/or to modify the listeners' emotions during specified and adverse circumstances, such as that of a global health crisis.

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