The Arts in Psychotherapy 48 (2016) 62–68

Contents lists available at ScienceDirect

The Arts in Psychotherapy

The mechanism of music for reducing psychological stress: Music preference as a mediator

Jun Jiang [a], Daphne Rickson [b], Cunmei Jiang [c,*]

[a] Education College, Shanghai Normal University, Shanghai, China
[b] New Zealand School of Music, Wellington, New Zealand
[c] Music College, Shanghai Normal University, Shanghai, China

ARTICLE INFO

Article history:
Received 22 August 2015
Received in revised form 7 February 2016
Accepted 16 February 2016
Available online 27 February 2016

Keywords:
Valence
Arousal
Music preference
Psychological stress
Mediator

ABSTRACT

In order to examine the mechanisms through which music might alleviate psychological stress, a study of the effects of music listening following induced stress was conducted. Female music education students ($N = 200$) were randomly assigned to eight groups, after experiencing induced stress via a mental arithmetic test. Individuals in each group listened through headphones to one piece of music classified in terms of the levels of arousal and valence of music, and familiarity. Participants rated their tension and state anxiety levels before and after music listening, as well as their levels of valence and arousal for music, music preference, and familiarity, after listening. The results revealed that the levels of arousal and valence, and the degree of music preference predicted tension and state anxiety levels, and the effects of music valence and arousal on stress reduction were partially mediated by music preference. The most important factor in reducing stress was the degree of liking for the music, but not the degree of familiarity with the music. Our findings have important implications for individuals, and clinicians, who use music to reduce stress.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Psychological stress (hereafter referred to as stress) is one of the most critical problems in modern society, and has become a great risk to human health. Listening to music is a non-invasive intervention, which can be used to alleviate stress because of its close correlation with emotion (e.g., Bradt, Dileo, & Shim, 2013; Linnemann, Ditzen, Strahler, Doerr, & Nater, 2015; Robb, Nichols, Rutan, Bishop, & Parker, 1995; Thoma et al., 2015). Not all music is appropriate for stress reduction however (Chafin, Roy, Gerin, & Christenfeld, 2004; Yehuda, 2011). Knowing how various factors associated with music listening can impact on stress reduction would enable music listeners to more readily choose music appropriate for this purpose, and increase efficacy.

Music is considered to have properties that induce arousal (low arousal vs. high arousal) and valence (low pleasure vs. high pleasure), which are in turn mediated by listeners' music training background, music preference, and familiarity with the piece. More specifically, low-arousal music is considered to be more effective than high-arousal music in alleviating tension or state anxiety (Fisher & Greenberg, 1972; Gan, Lim, & Haw, 2015; Iwanaga, Kobayashi, & Kawasaki, 2005; Iwanaga & Moroki, 1999; Lingham & Theorell, 2009; Sandstrom & Russo, 2010); high-pleasure music tends to reduce stress more effectively than low-pleasure music (Sandstrom & Russo, 2010); musically trained listeners were found to have a lower state anxiety score after listening to low-arousal music compared with untrained listeners (Smith & Morris, 1977); familiar music can make listeners less anxious (Sung, Lee, Li, & Watson, 2012), calm and tranquil (Margounakis & Politis, 2012). Furthermore, it has been suggested that music preference correlates negatively with state anxiety (Smith & Morris, 1977), and positively with relaxation (Stratton & Zalanowski, 1984). The effect of preferred music listening on stress reduction has been reported for college students (Davis & Thaut, 1989; Iwanaga & Moroki, 1999; Jeong, 2008), air traffic controllers (Lesiuk, 2008), and patients (Clark et al., 2006; Rosenow & Silverman, 2014). There is also a positive correlation between years of music training and perceived and felt emotions (Castro & Lima, 2014; Lima & Castro, 2011; Rawlings & Leow, 2008). In these studies, the longer the music training listeners have, the more intensely they were able to perceive and experience the emotional impact of the music.

In contrast, other studies found no association between arousal (Rohner & Miller, 1980; Stratton & Zalanowski, 1984), music preference (Sandstrom & Russo, 2010), familiarity (Chafin et al., 2004; Hatta & Nakamura, 1991), music training (Knight & Rickard, 2001;

* Corresponding author at: Music College, Shanghai Normal University, 100 E. Guilin Road, Shanghai 200234, China.
E-mail address: cunmeijiang@126.com (C. Jiang).

http://dx.doi.org/10.1016/j.aip.2016.02.002
0197-4556/© 2016 Elsevier Ltd. All rights reserved.

Laohawattanakun et al., 2011) and stress reduction. These contradictory findings suggest the relationships amongst these factors are complex. Indeed, several studies have observed the interactions between arousal and familiarity (Iwanaga, Ikeda, & Iwaki, 1996), between arousal and music preference (Jiang, Zhou, Rickson, & Jiang, 2013), and between music type and music training (Wang, 2014). For example, Jiang et al. (2013) found that listening to low-arousal music induced significantly lower tension and state anxiety levels than listening to high-arousal music when music was not preferred. However, there was no significant difference between low-arousal and high-arousal music for reducing tension and state anxiety levels when music was preferred.

The aim of the present study was to examine the mechanisms through which music might alleviate psychological stress. Specifically we aimed to determine how the factors influence stress reduction and which factor plays the most important role in stress reduction. In order to examine the role of music training on stress reduction, we included participants with different lengths of music training ranging from 0.5 to 14 years. Potential participants who experienced induced stress after a mental arithmetic test were included in this study.

2. Method

2.1. Participants

Two hundred and eighty female undergraduates majoring in music education were recruited for this study. This study was approved by the Ethics Committee of Shanghai Normal University. All participants had normal hearing, volunteered for the research and provided written informed consents. Eighty participants were excluded because they did not experience induced stress after a mental arithmetic test. Consequently, 200 participants took part in this experiment and were assigned to eight experimental groups ($n = 25$), each listening to one piece of music: familiar high arousal-high pleasure music (FHHM), familiar high arousal-low pleasure music (FHLM), familiar low arousal-low pleasure music (FLLM), familiar low arousal-high pleasure music (FLHM), unfamiliar high arousal-high pleasure music (UHHM), unfamiliar high arousal-low pleasure music (UHLM), unfamiliar low arousal-low pleasure music (ULLM), and unfamiliar low arousal-high pleasure music (ULHM). Table 1 presents the participants' characteristics and the means and standard deviations of tension and state anxiety levels before and after the mental arithmetic task (stressor). A one-way analysis of variance (ANOVA) indicated that there were no significant differences in age, $F(7,192) = 1.31$, $p = .249$, $\eta_p^2 = .05$, and length of music training, $F(7,192) = 0.85$, $p = .549$, $\eta_p^2 = .03$, across the eight groups. To assess the efficacy of the stressor, we conducted a two-way ANOVA on tension or state anxiety level, with time (prestressor and poststressor) as the within-subjects variable and group (FHHM, FHLM, FLLM, FLHM, UHHM, UHLM, ULLM and ULHM) as the between-subjects variable. For the tension level, There was a significant main effect of time, $F(1,192) = 1007.81$, $p < .001$, $\eta_p^2 = .84$, but the main effect of group, $F(7,192) = 0.55$, $p = .797$, $\eta_p^2 = .02$, and the time by group interaction, $F(7,192) = 0.43$, $p = .884$, $\eta_p^2 = .02$, were not significant. For the state anxiety level, the main effect of time was significant, $F(1,192) = 604.13$, $p < .001$, $\eta_p^2 = .76$, although the main effect of group, $F(7,192) = 1.27$, $p = .266$, $\eta_p^2 = .04$, and the interaction between time and group, $F(7,192) = 0.49$, $p = .844$, $\eta_p^2 = .02$, did not reach significance. These results indicated that the mental arithmetic task increased participants' stress levels, and the eight groups did not differ in the tension and state anxiety levels prior to listening to music.

2.2. Stimuli

A pretest study was conducted to select music excerpts for this study. Thirty two music excerpts were selected by the experimenters, each representing one of the four quadrants of Russell's (1980) circumplex model. In this model, emotional states reflect a mixture of two core dimensions, valence and arousal representing pleasantness (hedonic tone) and excitation (intensity). There are thus four quadrants in the circumplex model including high-pleasure and high-arousal emotions, low-pleasure and high-arousal emotions, low-pleasure and low-arousal emotions, and high-pleasure and low-arousal emotions. The heuristic value of the two-dimensional model was confirmed measuring emotional expression and induction through music (e.g., Eerola & Vuoskoski, 2011; Ritossa & Rickard, 2004; Schubert, 1999; Vieillard et al., 2008). Twenty female undergraduates majoring in music education who did not participate in the formal experiment listened to the excerpts, and rated each on valence, arousal, and familiarity. In terms of valence, the excerpts with a mean rating higher than five were considered as high-pleasure music, a mean rating lower than three being low-pleasure music. Similarly, the excerpts with a mean arousal rating higher than five were high-arousal music, while those with a mean rating lower than three were considered as low-arousal music. Familiar excerpts were those with a familiarity rating higher than five, while unfamiliar excerpts were those with a familiarity rating lower than three. In order to ensure the participants in the FHHM, FHLM, FLLM, and FLHM groups were familiar with music excerpts, all of the participants were asked to listen repeatedly to the four pieces of music rated 'familiar' in the pre-test (*Victory*, *Mars—the Bringer of War*, *Ase's Death*, and *Tempo di Bolero moderato assai*), and as far as possible to remember them within two weeks prior to the formal experiment. Based on the ratings, the most representative eight excerpts (see Table 2) were selected as the music stimuli. All music excerpts were instrumental music composed by Western composers to avoid the influence of lyrics on listeners' emotional responses to music (Ali & Peynircioglu, 2006; Brattico et al., 2011; Hunter, Schellenberg, & Schimmack, 2010; Stratton & Zalanowski, 1994). The duration of all excerpts was 4:35 with a 1-s fade-in and/or a 1-s fade-out (Kreutz, Ott, Teichmann, Osawa, & Vaitl, 2008; Sandstrom & Russo, 2010).

2.3. Measures

A mental arithmetic test as a stressor was administered to induce participants' stress. There were 50 items (e.g., 1. $8026 - 37 = ?$ 10. $7386 \times 2 = ?$) in the test, and participants were required to complete the items within 5 min.

The Tension Rating Scale was used to measure the levels of tension participants felt. They were required to rate their own levels of tension on a 4-point Likert scale with 1 being "*not at all*", 2 being "*slightly*", 3 being "*moderately*", and 4 being "*very much*". Higher ratings indicate more tense participants felt. The State Anxiety Inventory, a subscale of State-Trait Anxiety Inventory (STAI; Spielberger, 1983), was used to measure the state anxiety levels. STAI is a 40-item self-report questionnaire with 20 of the items making up the State Anxiety Inventory (SAI), and the other 20 items making up the Trait Anxiety Inventory (TAI). The STAI uses a 4-point Likert scale response format with a range from 1 ("*not at all*" for the SAI or "*almost never*" for the TAI) to 4 ("*very much so*" for the SAI or "*almost always*" for the TAI). Higher scores indicate higher levels of anxiety. Test–retest stability coefficients for the SAI range from .16 to .62, and correlations for the TAI range from .73 to .86 (Spielberger, 1983). The STAI has also demonstrated good concurrent and construct validity (Spielberger, Sydeman, Owen, & Marsh, 1999).

Download English Version:

https://daneshyari.com/en/article/343579

Download Persian Version:

https://daneshyari.com/article/343579

Daneshyari.com