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Role of Musical Education in Cognitive Emotion Regulation- A Study Among Young Adults

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Abstract

The contemporary thrust area of neuroscience and cognitive psychology extends its interest in the musical contribution in brain and behaviour. Music has been found to influence the wellbeing, cognitive flexibility, emotion regulation among healthy as well as clinical population. Hence a brief study in this area, to explore the role of musical education in cognitive emotion regulation was warranted in the Bengali socio-cultural context, so that the importance of further critical research can be understood, in this area. The current study used purposive sampling to determine the sample, which was divided into four groups with respect to the specific research inclusion and exclusion criteria. The sample comprised of 120 individuals, 30 individuals in each group. Cognitive Emotion Regulation Questionnaire (CERQ) was used as the measurement tool. Mean, Standard Deviation, ANOVA and t-test were used as the statistical models. Result showed significant differences with respect to self-blaming, rumination and acceptance among the four groups.

Keywords: *Cognitive emotion regulation, music, education*

It has been found that the psychology of music is related to understand different psychological aspects and processes involved playing, listening, singing and composing music. The brain and music relationship with respect to the various components of music like, rhythm, melody, pitch, timbre, dynamics, etc.; is a great area of research interest over last century (Platel, 2002; Rakshit, 2017). Contemporary research in the area of neuroscience highlights how musical training, regular practise and exposure can influence the higher cognitive capacities and provides a healthy functioning of human brain. (Fabuhashi, 2001; Rakshit, 2017; Nasreen, et al., 2016). Music also serves as a catalyst to emotional expression, the vocal or instrumental engagement with the help of lyrics or notation helps in the expression of the suppressed emotional feelings. It has the power to evoke profound emotions in the listeners as well as the practitioners (Gabrielsson, 2011; Das, Chatterjee & Das, 2018; Rakshit, 2017). Engagement with music also contributes to decrease the negative emotional outcomes, influencing the emotion regulation (Marik & Stegemann, 2016; Das, Chatterjee & Das, 2018).

Gross & Thompson, (2007) referred emotion regulation as a heterogeneous set of strategies by which individuals may decrease, maintain or increase emotions according to the objectives. With the increase of interest in the cognitive psychology and neuroscience, a rich interest in the area of Cognitive Emotion Regulation grew. Cognitive emotion regulation is the cognitive way of managing the input of emotionally arousing information (Garnefski et al., 2001). Therefore, the relationship between music and cognitive emotion regulation can be examined thoroughly, as musical activity led to adaptive performance of the executive functioning, where the higher order cognitive functioning is being significantly influenced through music (Zuk, et al., 2014; Nasreen, et al., 2016; Hannon & Trainor., 2007) with better cognitive flexibility compared to non-musicians (Zuk, et al., 2014).

Musical Training and Musical Education are the terminologies that are used interchangeably, but there lies a difference in these two terms, with respect to the Bengali socio-cultural context. Music Training per se is the training in any particular genre of music (gharana), where the guru shishya Parampara is central; including intensive training in any particular gharana. On the other hand, Musical Education is inclusion of Music in academics throughout the world, where music is treated as a subject imparted through various graduation and post-graduation courses. It is a different system unlike musical training, where several types of exposure through various teachers are carried out with different syllabi in universities. Nevertheless, musical education is embedded in musical training.

Therefore, it can be understood that Music has a significant role to play in the cognitive functioning, hence the current study, has attempted to explore the role of musical education if any, in cognitive emotion regulation among young adults. But there are several questions that must be raised here, like “are there any neuronal mechanisms that modifies cognitive functioning through music?”, “are the behavioural manifestations due to cognitive emotional regulation are mediated by music?” Hence, the present study can act as a precursor to start the critical and necessary investigations in this much less explored area.

Objective

The objective of the study was to determine if there is any significant difference present among four groups (without training, with musical training but different educational background, education in Vocal Music, education in instrumental music) corresponding Cognitive Emotion Regulation.

Methods

Sample

The sampling technique used to draw the sample from the population was Homogeneous Purposive Sampling.

The total sample comprised of 120 participants, divided among 4 groups as per the requirement

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criteria of the research. Each group comprised of 30 participants. Group 1 comprised of the participants who were not associated with any form of musical training or education. Group 2 comprised of the participants who were not associated with musical education but has received musical training. Group 3 comprised of the participants who were graduates in Vocal Music from Kolkata. Group 4 comprised of the participants who were graduates in Instrumental Music from Kolkata. Participants included in the study were young adults aged 18 to 25 years, and scoring average in Cattell 'G' Culture Fair Intelligence Test. The groups were matched in terms of Intelligence, Age, Sex and Socio-economic background.

Specific Inclusion and Exclusion Criteria:

For group 1: participants who had never received any formal training in Music, aged 18-25 years, Graduates, living in Kolkata, with average Intelligence quotient were included in the research.

For group 2: participants who had received formal training in Music, aged 18-25 years, Graduates in subjects other than Music, living in Kolkata, with average Intelligence quotient were included in the research.

For group 3: participants who were graduates in Vocal Music, aged 18-25 years, living in Kolkata, with average Intelligence quotient were included in the research.

For group 4: participants who were graduates in Instrumental Music, aged 18-25 years, living in Kolkata, with average Intelligence quotient were included in the research.

Participants with history of any physical disability, head injury, epilepsy, mental illness, drug abuse, and scoring low average or above average in Cattell 'G' Culture Fair Intelligence Test were excluded from the research.

Tools

The current study followed ICMR Policy on research integrity andthe four basic principles of research ethics that are: autonomy, beneficence, non-maleficence and justice.

- Informed Consent: The purpose and aims of the research was debriefed to the participants in the consent form. The participant who understood and consciously agreed to participate in the research signed the consent form for further research participation. Further, confidentiality of the data collected was assured.
- Information Schedule: Personal information about the participants was collected through information schedule as per the requirements of the research.
- Cattell 'G' Culture Fair Intelligence Test: In this research the Level 3 of Cattell 'G' Culture Fair Intelligence Test was used to measure the Intelligence Quotient of the participants. The test was developed by Raymond, B. Cattell, 1971 to measure the fluid intelligence.
- Cognitive Emotion Regulation Questionnaire: This tool was used to measure the cognitive emotion regulation strategies used by the participants of the four groups after they experience any negative event or situation. The tool was developed by Garnefski, Kraij&Spinhoven, 1999. The questionnaire is a self-report measure consisting of 36 items. It has 9 sub-domains namely Self-blame, Acceptance, Rumination, Positive refocusing, Refocus on planning, Positive reappraisal, Putting into perspective, Catastrophizing, and Other-blame.

Procedure

Step 1: The participants were debriefed about the study and given the consent form. Those who consciously agreed to participate, signing the consent form Information Schedule was asked to fill. After filling the information schedule, the Cattell 'G' Culture fair Intelligence Test was administered. The participants whose IQ score was found to be in the Average category were further selected for the study. The selected participants were further asked to fill the Cognitive Emotion Regulation Questionnaire. The time required for the completion of the tools administration were 1 hour 30 minutes approximately. Furthermore, based on the inclusion and the exclusion criteria participants were selected and divided into four groups.

Step 2: Respective Standard method of administration was followed for the tools.

Step 3: After the completion of the data collection, the responses given by the participants were scrutinized and scored.

Step 4: Scoring for all the tests were done manually according to the respective manuals of the tools used. The statistical treatment of the scores was done using IBM SPSS version 21.0

Results and Discussion

The current study followed a matched group design, to determine if there is any significant difference present among four groups (without training, with musical training but different educational background, education in Vocal Music, education in instrumental music) corresponding Cognitive Emotion Regulation.

From table 2, it has been found that there is a significant mean difference among the four groups, namely without training, with training, education in only vocal music and education in only instrumental music with respect to self-blaming, acceptance and rumination. The F-ratio found with respect of self-blaming was 2.69 ($p< 0.05$ level). F-ratio found with respect to Acceptance was 4.06 ($p<0.05$ level) and f-ratio found with respect to Rumination was 3.39 ($p<0.05$ level). Further independent t-tests have been done to compare four groups with each other, which have been discussed in the following.

Further analysis showed, in case of Self blaming significant t-values were found between without training group vs. education in only vocal music (t

value of 3.08, significant at 0.01 level) and education in only instrumental music groups (t value of 2.73, significant at 0.01 level) and between with training group vs. education in only vocal (t value of 2.91, significant at 0.01 level) and education in only instrumental music groups (t value of 2.92, significant at 0.05 level). Therefore, it can be said that individuals with training but with different educational background (mean 8.96) who have higher self-blaming as a style of cognitive emotion regulation. It can also be said that individuals with education in instrumental music has higher self-blaming (mean 10.46) than the individuals without any training in music (mean 8.83), and the individuals the individuals educated in only vocal music have low self-blaming (mean 7.5) than the individuals without any training in music (mean 8.83), and the with training but with different educational background (mean 8.96) who have higher self-blaming as a style of cognitive emotion regulation.

Table 1: Showing the Mean and Standard Deviation among Without Training group (N= 30), With Training and education in other streams group (N=30), Education in Vocal Music group (N=30) and Education in Instrumental Music group (N= 30)

Cognitive Emotion Regulation	Without Training		With Training and education in other streams		Education in Vocal Music		Education in Instrumental Music	
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Self-Blame	8.83	1.41	8.96	2.79	7.5	3.53	10.46	3.63
Acceptance	10	2.12	10.1	2.12	11.1	4.07	8.5	3.06
Rumination	12.6	1.2	11	1.8	7	2.3	12	2.1
Positive Refocusing	12.6	3.53	11.93	1.41	11	4.24	12.8	3.42
Refocus on Planning	13.76	4.94	14.03	2.77	14	2.82	14.8	3.97
Positive Reappraisal	14.16	4.24	13.86	2.12	14.5	2.12	14.2	3.34
Putting into Perspective	11.8	0.70	12.96	0.70	11.5	2.12	11.1	3.20
Catastrophizing	9.56	1.41	9.83	0.70	5	4.56	9.6	2.84
Other Blame	7.96	4.24	7.7	2.75	7	1.41	8.76	3.25

Table 2: Showing the Sum of Squares, Mean Square and F ratio representing the significance of difference with respect to the different sub domains of Cognitive Emotion Regulation among Without Training group (N= 30), With Training and education in other streams group (N=30), Education in Vocal Music group (N=30) and Education in Instrumental Music group (N= 30):

Source of Variation		Sum of Squares	Df	Mean Square	F-ratio
Self-blame	Between group	96.3	3	32.100	2.69*
	Within group	1382.06	116	11.91	
Acceptance	Between group	127.82	3	42.60	4.06*
	Within group	1216.76	116	10.48	
Rumination	Between group	93.36	3	31.12	3.39*
	Within group	1063.8	116	9.17	
Positive Refocusing	Between group	27.15	3	9.05	.663
	Within group	1582.83	116	13.64	
Refocus on Planning	Between group	17.49	3	5.83	.445
	Within group	1521.43	116	13.11	
Positive Reappraisal	Between group	37.49	3	12.49	1.03
	Within group	1401.10	116	12.07	
Putting into Perspective	Between group	53.53	3	17.84	1.52
	Within group	1359.93	116	11.72	
Catastrophizing	Between group	15.66	3	5.22	.422
	Within group	1434.20	116	12.36	
Other Blame	Between group	23.86	3	7.95	.850
	Within group	1085.09	116	9.35	

**p= <0.05*

In case of Acceptance significant t-values were found between education in vocal music vs. without training (t value 2.87, significant at 0.01 level), and with training groups (t value of 2.69, significant at 0.01 level). Therefore, it can be said individuals educated in vocal music has higher acceptance (mean 11.1) than without training group (mean 10) and with training group (mean 10.1) who have lower acceptance as a style of cognitive emotion regulation.

In case of Rumination significant t-values were found between education in vocal music group vs. without training (t value of 2.50, significant at 0.05 level) and with training group (t value of 2.56, significant at 0.05 level), and between education in vocal group vs. education in instrumental group (t value of 2.10, significant at 0.05 level). Therefore, it can be said that individuals educated in vocal music (mean 7) ruminate lesser than the individuals without any training in music (mean 12.6) and the individuals with training but education in other domain (mean 11). It was further seen that, amongst the education in music group, the individuals with education in vocal music (mean 7) ruminate lesser as a style of emotion regulation than the individuals with education in instrumental music (mean 12).

From the above results discussed, it can be said that the individuals with education in instrumental music use self-blaming and rumination so as to regulate their emotions more than that of the individuals with education in vocal music. Moreover, it can be said that individuals with education in vocal music use acceptance more than self-blaming and rumination so as to regulate their emotion. This can be explained as per (Cooper & Wills, 1989; Kenny & Ackermann, 2009; Vaag, Giæver, &Bjerkeset, 2013), who have found that professional musicians have to go through tremendous physical, social and psychological stresses in order to gain success in their career. The self-blaming and ruminating style of emotion regulation leads to mental health issues among the musicians, Jones et al. (2014), found that musician scoring high in reflective rumination have a high score in musical ability further it was also found that brooding rumination was a better predictor of depression among the musicians. Hence, introspecting, self-blaming and continuously worrying over a same incident or event may help an individual to be self-reflective, but it may be fatal too. Fox, Dutton, Yates, Georgiou and Mouchlianitis (2015); Quinn and Joormann (2015), found that musicians with ruminative personality are less able to cope with stressful conditions of life, which may further contribute to depression and related mental disorders. The current finding and literature indicate, the ruminative cognitive emotion regulation of the instrumental musical students' needs to be addressed for their better well-being.

On the contrary, individuals having education in vocal music are more accepting than self- blaming or ruminating, which can be due to the mechanism; singing or vocalization of music provide better emotional expression and emotional communication. Welch (2005), pointed out that, human vocalization is diverse, which contains important components of musical development and it influences the early abilities to communicate through music. Neurologically speaking, spoken language is bilaterally processed, where left hemisphere deals with semantics and phonetic whereas right hemisphere deals with tone and prosody. The tunes of speech are the first linguistic components to be learned and they are indistinguishable from the intra and interpersonal communication of music, for example caregiver's singing of lullabies and play songs directed to the infants. Moreover, the underlying integration of connation with cognition and perception form a network of linked vocal and emotional behaviour that is further pivotal to communication. The primary emotions (six) are communicated vocally and belong to human vocal behaviour, which is also an integral part of human musical communication found across the human life span. These emotional features are used to communicate complex meanings, aesthetic values, and music from childhood to adulthood.

Peretz, (2001), has pointed out that various distinct cortical and subcortical structures of right hemisphere are linked with the emotional evaluation of the vocal sounds. Fear, anger, joy, sadness, surprise and disgust are commonly vocally expressed Titze, (1994), and are well differentiated by strong vocal acoustic variations through music. Hence, voice is an essential part of human identity and expression which leads to emotional catharsis in a better way; giving rise to musical communications Scherer (1995), where, acceptance as a cognitive style of emotion regulation may be maximally used whenever vocal musicians are psychologically challenged.

Therefore, the current study warrants further investigation regarding the cognitive emotion regulation styles of the individuals who are instrumentally and vocally educated in music. The current study has raised questions regarding the communicability of music and its ability to foster emotional expression through human voice and speech as well as the general ability of music to foster cognitive emotion regulation.

Conclusion

The present study has indicated about the role of musical education in cognitive emotion regulation. Significant findings have been found, which has reflected regarding the usage of self-blaming and rumination as cognitive style, higher among the individuals with instrumental music education to regulate their emotions, whereas usage of acceptance as a cognitive style to regulate emotion has been found among the individuals with vocal music education.

The study has contributed to know about the different cognitive emotion regulation style among

the individuals with different levels of musical education. It has contributed to think about the role of vocal music in emotional communicability which may be a reason for better acceptance among the individuals educated in vocal music. Hence, this study may provide further scope to explore ability of vocal music in fostering acceptance, and help us to know how self-reflection, introspection may contribute to rumination, self-blaming; further exploring the influence of rumination and self-blame in the mental health among the instrumental musicians. Overall, this study has also highlighted the importance of investing the cognitive emotion regulation among musicians, and has raised many questions which may further foster investigation in this area.

Although the current study has limitations like,

- No. of participants are less, decreasing generalizability
- Cross-sectional study

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