

Analysis of the Musical Factors and Personal Factors Affecting the Music-Evoked Autobiographical Memory among Teenagers

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Abstract: Music-evoked autobiographical Memory (MEAM) is a distinct form of autobiographical memory that is intricately intertwined with the experience of music. The present study centers its attention on the many musical and human aspects that exerted an influence on the Music-Evoked Autobiographical Memory process among adolescents. Through the administration of a questionnaire to a sample of 312 high school and college students, the researcher discovered that various factors, including the genre of music, the level of mood-matching between the music and the individual, the emotional response elicited during listening, and the level of arousal experienced by the listener, exert substantial influences on the MEAM. The results of this study provide evidence in favor of the concept that individual emotional experiences and the substance of music might influence the process of memory. This result demonstrates the potential implications of MEAM for the fields of music therapy, education, and the music industry.

Keywords: music-evoked autobiographical memory, teenager, music industry

1. Introduction

Music-evoked autobiographical Memory (MEAM) refers to the phenomenon that familiar music acts as a potent stimulus for the retrieval of autobiographical memories. This cognitive process involves the activation of various neural networks encompassing auditory perception, memory retrieval, and emotional processing. The unique ability of music to serve as a retrieval cue for autobiographical memories demonstrates its capacity to engage sensory, cognitive, and emotional dimensions simultaneously.

The current research on MEAM has primarily focused on music's influence on memory formation and retention. These existing studies have explored how music enhances encoding, storage, and retrieval processes in memory, examining the role of music in facilitating the creation of memories and improving the long-term retention of information [1]. While these findings contribute to our understanding of the music's influence on memory process, they do not directly address the specific factors that influence the activation of memory through music. Therefore, this research aims to investigate the musical and personal factors that influence the process of MEAM, exploring how different elements such as melody, rhythm, lyrics, and emotional content contribute to the activation and retrieval of memories.

In order to carry out this study, an evaluation of the existing studies on MEAM will be conducted: the present studies aim to review a range of research over the past several decades about the various aspects associated with the activation of music-evoked memory. By synthesizing the findings from these studies, the author will identify and delineate the most salient factors contributing to this phenomenon. Next, a survey will be undertaken to investigate the phenomenon of music-evoked memory among high school and college students, with the aim of further examining the elements that contribute to its activation.

By identifying the specific factors that modulate the effects of music on memory activation, like the type of music, emotional valence, individual differences, and environmental context, this study is able to provide insights into designing music therapy, creates a more scientific approach to song list design, and brings practical implications on music education. Ultimately, this research has the potential to impact both theory and practice in the field of cognitive psychology and education.

2. Methodology

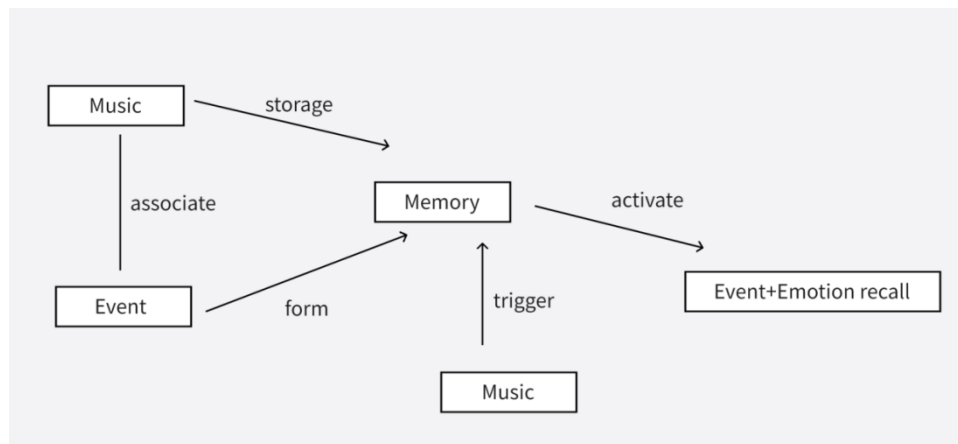


Figure 1: The framework of the music-evoked autobiographical memory.

To begin the research, a framework of the MEAM process is made (figure 1). The process of MEAM involves a dynamic interaction between the listener's experiences, music, and memory formation. Here's a detailed description of this process.

First, event and Music Experience: During a particular event, the listener is exposed to background music or deliberately chosen music that accompanies the event. This could be a personal encounter, a special occasion, or any significant life experience. Second, memory Formation: As the listener experiences the event while listening to music, the brain processes and encodes information from the overall experience, forming memories associated with the specific context. Third, association between Event and Music: The unique aspect of the memory formation process occurs when the brain establishes a strong association between the event and the music played during that event. Fourth, memory Storage: The encoded memories, including the connection between the event and the accompanying music, are stored in different regions of the brain, like the hippocampus and auditory dorsal stream [2]. Fifth, Memory Retrieval: Later, when the listener encounters the same piece of music again, the music acts as a powerful cue for memory retrieval. The familiar musical stimulus triggers the activation of associated memories formed during the original event. Sixth, enhanced Memory Activation through Music: the distinguished characteristics of music, like its melodies, rhythm patterns, and emotion, can stimulate neural networks involved in memory representation and facilitate the recall of specific events, emotions, or details associated with the experience. Seventh, memory reminiscence: The listener is then able to reminisce aspects of the original event, emotions,

or details connected to the experience. These information are all triggered by listening to the same music that served as a cue for memory activation.

The process demonstrates how music becomes intertwined with memory formation and retrieval. By using music as a retrieval cue, individuals can go deep into their autobiographical memory, re-experience the emotion related to the event, and recall the details associated with it.

2.1. Factor Analysis

To examine the factors that affect the MEAM process, a survey will be conducted. The survey will include questions related to one's music experience as well as the memory triggered by the music. Before the survey, the author reviewed past studies related to music and memory to explore the possible factors that have influence on the memory process.

First, musical elements of the song. A study conducted by BMC Neuroscience has revealed the influence of titles and melodies on people's FOK(feeling of knowing). The study suggests that when listening to instrumental music, people tend to recall the title better by using melodies as cues than by using the title to recall the melodies. And for music with lyrics, the result was the opposite, even when the lyrics are absent, people tend to recall melodies more often than titles [3]. This research indicates that the presence of lyrics in a music piece impacts the way individuals remember and retrieve information associated with the song, indicating that the melodies and lyrics interact and may play important roles in people's MEAM process.

Second, valence and arousal level of the song. A recent study on music-evoked autobiographical memory has demonstrated the emotions related to music-evoked memory. The study shows that about 30% of the song could trigger the listener's autobiographical memory, and the majority of these song has also evoked strong memories, primarily positive [4]. Such result is consistent with the retrieval of emotional memories study which shows positive and high arousing events can enhance recall [5]. In conclusion, this study provides the idea that various elements of music-listening like valence and arousal level should be analyzed in different ways.

Third, the attractiveness of music. A study about the emotion level of music has shown the effect of music's attractiveness on memory. The participants first listened to 40 music experts, and were asked to rate their valence and intensity; a week later when they listened to these experts again, the music that was more attractive was recognized as significantly better [6]. This study suggests that the attractiveness of music has an important effect on memory activation, showing that music with high attractiveness can lead to better recall and recognition of the piece as well as the event related to the music.

Fourth, mood-matching level. Another study on music's effect on working memory shows that people tended to recall the mood-matching music significantly better than the mismatching music, and their working memory was greater under the mood-matching music condition [7]. Such results reveal the possible intervention for cognitive decline among elders with appropriate music. Moreover, this finding highlights the importance of mood-matching music in facilitating memory activation and enhancing the experience related to music, suggesting that the mood-matching level could be a crucial factor for the music-evoked memory.

2.2. Target Analysis and Survey Design

Teenagers, as the largest music audience, have a significant impact on popular music and are passionate about expressing themselves through it. Their scale and enthusiasm are unmatched by other age groups, making them the best representatives of the entire population's interaction with music. Moreover, music is a valuable tool for teenagers to communicate, discover themselves, and support their intellectual and moral development, which is crucial for their future.

Given this setting, high school students and college students will be the target population of the questionnaire. With the aim of obtaining statistically significant results, the researcher has determined that a sample size of 300 individuals, coming from different regions in the country, will be necessary. This sample selection was chosen to ensure the reliability and representativeness of the findings, allowing for a comprehensive understanding of the broader teenager's music and memory engagement.

Relevant studies have found that the MEAM process is influenced by music listening emotions, genre, perceived attractiveness, listener arousal, and mood congruence. The author incorporates these factors into survey questions to measure their influence. The questionnaire also asked about the listener's education, musical tastes, and extroversion. Since musical experience is subjective, the above information may potentially affect music-evoked memory.

The questions of the survey are categorized into three key dimensions: music, event and listener. The music genre, attractiveness and valence and the music elements of the song belong to music category; the emotion of the event, the arousal level of the event, and the time interval between the first exposure to music and the re-listening belong to the event category; the personal information and the emotional feeling of re-listening to the song belong to the listener category. The questions of the survey focus on one particular song that triggers the strongest memory for the listener, and ask their experience of listening to the song. By focusing on one song, the abstract concept like attractiveness and arousal level can be specified to the participants.

3. Result Analysis

312 samples were collected by the end of the survey, and few factors have demonstrated significant effect on the MEAM. The majority of the questions in the survey is about the song with strongest memory activation. Throughout the survey, there are some key elements in the memory formation and the activation process that appears to play an important role in connecting the song and the event and also make them memorable. These factors, therefore, are the desired finding for the survey.

3.1. Reliability and Validity

Reliability, refers to the degree to which a questionnaire is trustworthy in measuring what it intends to measure, and it primarily demonstrates the consistency, coherence, and stability of the test results. This article adopts the α coefficient to represent the consistency reliability within the scale, which is currently the most commonly used approach in scientific research. The testing formula is:

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum \sigma_i^2}{\sigma^2}\right) \quad (1)$$

In the above method, k represents the number of items in the questionnaire, σ_i^2 denotes the variance of the survey results for the i -th item, and σ^2 represents the total variance of all survey results. A higher α value indicates a greater consistency among the items within the questionnaire, representing better reliability of the scale. When the α coefficient is below 0.6, it indicates low reliability, and it is necessary to consider revising the questionnaire or selecting controversial indicators. A reliability above 0.9 indicates highly stable questionnaire data, while a range of 0.7 to 0.8 is considered relatively stable.

The aforementioned approach was utilized to determine the reliability of each dimension and the total reliability of the influencing factors in the questionnaire. The outcomes of these calculations are displayed in the table provided. Based on the data presented in the table, it is evident that the

dependability values for each dimension in this survey surpass 0.6, suggesting a notable degree of result stability and a discernible level of reliability.

Table 1: Reliability analysis.

N of Items	n	Cronbach α
6	312	0.720

Validity testing assesses how well a complete evaluation system meets evaluation goals. Validity testing assesses questionnaire reliability and efficacy. Construct validity is the focus of this paper. The table 2 shows the results of the author’s KMO (Kaiser-Meyer-Olkin) test on questionnaire items for construct validity.

Table 2: Validity analysis.

KMO and Bartlett’s Test		
KMO		0.709
Bartlett’s Test of Sphericity	Chi-Square	122.125
	df	15

The validity indicators of the scale are determined through the process of exploratory factor analysis. In the results of the exploratory factor analysis, when $KMO > 0.9$ and the significance of Bartlett’s test of sphericity (p-value) is less than 0.05, it indicates that the questionnaire is highly suitable for principal component analysis. When $0.8 < KMO < 0.9$, it is considered suitable; when $0.7 < KMO < 0.8$, it is moderately suitable; when $0.6 < KMO < 0.7$, it is less suitable; and when KMO is below 0.5, it is not suitable for factor analysis. From the data in the table 2 above, the factor analysis in this study yielded a KMO value of 0.709, which is greater than 0.6. This shows that the validity of the survey is satisfactory.

3.2. Descriptive Analysis

3.2.1. Arousal Level

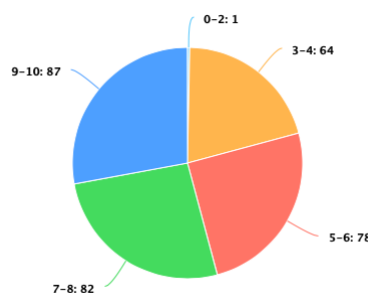


Figure 2: Pie chart of question about arousal level.

In the survey, a question is related with the emotional intensity which represents the arousal level of the listener when listening to the song: to rate their emotional intensity with 0 represents mild [8], little arousal and 10 represents an intense, high arousal. The result of this question is that 312

participants give answers with the average of 6.67 which stands for a relatively high arousal. Furthermore, there are 82 out of 312 people fill out the number of 7 and 8 that stand for the high arousal, and they take up the 26.28% of the total population; there are 87 out of 312 people fill out the number of 9 and 10 which stand for a very high arousal, taking up the 27.88% of the total population (figure 2). Among the participants, a combined total of 54.16% reported experiencing a high or very high level of arousal upon initially listening to the music that afterwards elicited their most powerful recollection. In contrast, only one individual out of the 312 participants (0.32%) indicated a very low level of arousal by selecting the number 2. This discovery suggests that the amount of arousal plays a role in the activation of memory through music. The proposition posits that the majority of humans require an elevated level of emotional arousal in order for music to establish a robust association with their memory, hence enabling the memory to consolidate and persist over an extended period.

3.2.2. Mood-Matching

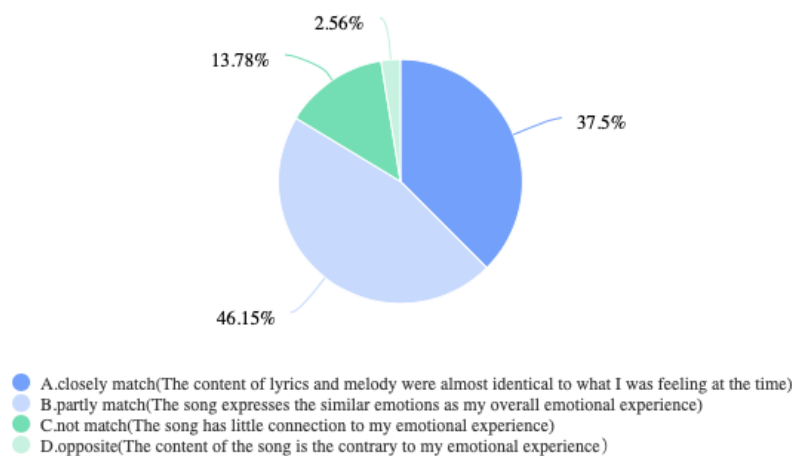


Figure 3: Pie chart on question on mood-matching level.

Another factor is the mood-matching level. In the question asked about how well does this song (the song that triggers the strongest memory) match listener's mood, there are four options: very match, partly match, not match and opposite. These options cover all the possibility for the listener's music experience. As can be seen in figure 3, 37.5% of the participants describe the song as "closely match" to their emotion, and 46.15% of the participants choose the "partly match". Together, 83.65% of participants feel that the song that evoked strongest memory matched their emotion. This result highlights the importance of mood-matching level in the formation of music-evoked memories. When the emotional content of a song resonates with the listener's mood, a stronger and more profound connection between the song and the event is established, enhancing the subsequent memory recall.

3.3. Lyrics' Influence on Memory Activation

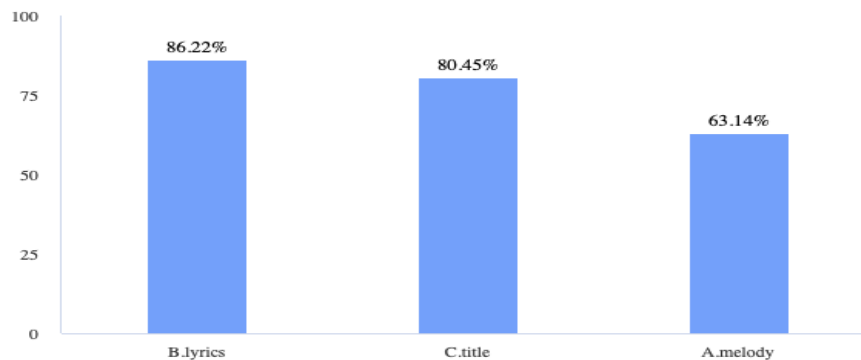


Figure 4: Histogram on question about music content.

Additionally, the inquiry pertains to the specific components inside a song that elicit the recollection. (Which particular aspect of the music prompted your memory?) The study has shown the noteworthy influence of lyrics and titles on the process of memory activation. Given that respondents have the option to select multiple answers for this particular question, it is important to note that the cumulative percentage may exceed 100%. Furthermore, as shown in figure 4, the findings indicate that a significant majority of individuals, namely 86.22%, perceive lyrics as the primary factor that stimulates their memory. In comparison, 80.45% of participants attribute this effect to the title, while a comparatively lower percentage of individuals, specifically 63.14%, associate it with the music. This finding indicates that the lyrical component holds the greatest significance in terms of eliciting music-evoked memory within a song. The lexical and narrative elements of a musical composition seem to have a significant impact on building a connection between those who engage with the music and their personal memories.

4. The Effect of Previous Emotional Experiences on Feelings During Re-Listening

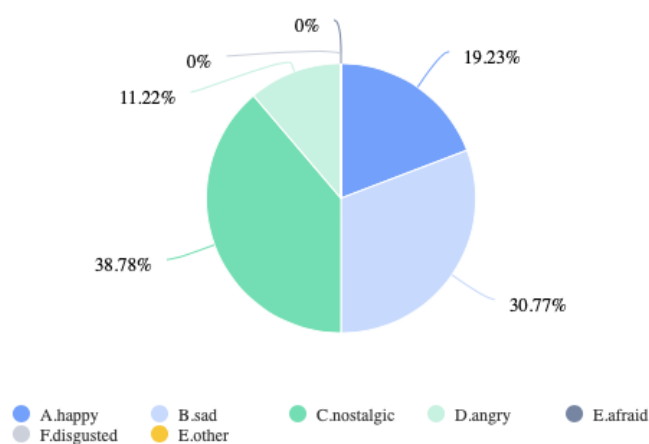


Figure 5: Pie chart on previous emotional experience.

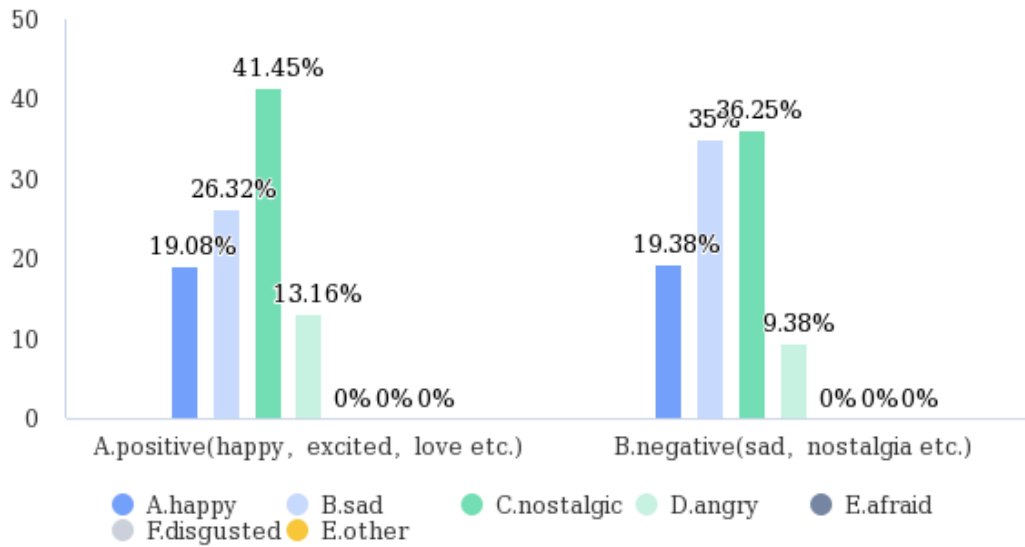


Figure 6: Histogram on the contrast of previous emotional experience and later experience.

In a question about the feeling of re-listening the song that evoked strong memory, participants have given a negative result. Based on the data in figure 6, 38.78% of participants have reported to experienced the feeling of nostalgia which is the most common feeling of re-listening the song; 30.77% of participants have reported to feel sad after listening to the song again; 11.22% of the participants have reported to feel angry. Since nostalgia is a complex emotion that include both positive and negative aspect, its valence will be categorized as ambivalent [9]. Consequently, the aggregate proportion of negative sentiment amounts to 41.99%, surpassing the proportion of good sentiment, which stands at 19.23% (figure 5). This observation indicates that although the song elicited a strong recollection with heightened emotional intensity, the act of re-listening to it does not consistently result in a positive experience. Instead, individuals often encounter feelings of nostalgia and sadness when revisiting the song.

Further analysis is also conducted on the emotional experience. The author did a cross-over between the previous emotional experience and the feeling of the re-listening. As shown in figure 6, 41.45% of participants who previously experienced positive emotion when listen to the song reported to have the feeling of nostalgia when re-listening, which is higher than the percentage of participants who once experienced negative emotion(36.25%). Similar to happiness, the positive group have reported a higher percentage(13.16%) of feeling angry than the negative group(9.38%). In contrast, 26.32% participants who have formerly experienced positive emotion feel sadness when re-listen to the song, lower than the percentage of feeling sadness of participants who once experienced negative emotion(35%). For the feeling of happiness, both group of participants have reported a similar result(19.08% and 19.38%).

This finding suggests that while feelings of nostalgia and sadness are commonly associated with re-listening to a significant song, the specific emotional response is also influenced by prior experiences. Individuals who have had more positive emotional encounters in the past may have a more nuanced and complex emotional reaction, whereas individuals with negative emotional experiences are more likely to feel negative mood like sadness.

4.1. Correlation Analysis

Table 3: Correlation analysis of music and personal factors.

	1	2	3	4	5	6	7	8	9	10	11	12
MEAM(1)	1											
music genre of the song(2)	0.552*	1										
valance of the song(3)	0.053	0.018	1									
Emotion when listening(4)	0.176*	-0.037	0.026	1								
Mood-matching level(5)	0.438*	0.155**	0.036	0.031	1							
Emotion intensity(6)	0.455*	-0.070	-0.098	0.155**	0.054	1						
time interval(7)	0.282*	0.171**	0.016	0.033	0.051	-0.054	1					
melody(8)	0.065	0.035	-0.106	-0.054	0.005	0.022	0.049	1				
lyrics(9)	0.065	0.013	-0.057	-0.036	0.037	-0.120*	0.105	-0.305**	1			
title(10)	0.047	-0.065	-0.021	0.085	-0.057	-0.018	0.053	-0.377**	0.084	1		
The emotion intensity during re-listening(11)	0.552*	0.114*	-0.039	-0.052	0.059	-0.006	0.009	0.061	0.083	0.047	1	
memory vividness(12)	0.374*	0.100	0.038	0.084	0.590**	0.011	0.049	-0.070	0.041	0.002-0.029	0.002-0.029	1

To conduct static analysis, the factor “MEAM” is calculated from the average data of emotion intensity during re-listening and memory vividness.

A correlation analysis was conducted to examine the associations between Music Memories and 11 variables. These variables included the music genre of the song, valance of the song, emotion experienced while listening, level of mood-matching, intensity of emotion, time interval, melody, lyrics, title, intensity of emotion during re-listening, and memory vividness. The Pearson correlation coefficient was employed to assess the magnitude of the associations.

From the table 3, the analysis reveals that Music Memories is significantly correlated with music genre of the song, emotion, mood-matching level, emotion intensity, time interval, and the emotion intensity during re-listening. The correlation coefficients for these variables are 0.552, 0.176, 0.438, 0.455, 0.282, and 0.552, respectively. All of these coefficients are greater than 0. However, since the emotion intensity during re-listening is counted as part of the music memory, its correlation with music memory is insignificant. Thus, the result implies that Music Memories has a positive correlation with music genre, emotion, mood-matching level, emotion intensity and time interval.

4.2. Regression Analysis

Table 4: Regression analysis of music and personal factors.

	Unstandardized Coefficients		Standardized Coefficients	t	p	collinearity diagnostics	
	B	Std. Error	Beta			VIF	tolerance
Constant	0.338	0.021	-	16.258	0.000**	-	-
music genre	0.090	0.002	0.446	51.434	0.000**	1.073	0.932
emotion	0.095	0.007	0.115	13.461	0.000**	1.038	0.964
Mood matching level	0.093	0.006	0.171	16.260	0.000**	1.575	0.635
Emotion intensity	0.087	0.002	0.472	55.296	0.000**	1.037	0.964
R ²	0.979						
Adj R ²	0.978						
F	1991.059***						
D-W	2.012						

Dependent Variable: MEAM

*p<0.05 **p<0.01

A linear regression analysis was conducted, wherein the independent factors included music genre, emotion, mood-matching level, and emotion intensity, while the dependent variable was MEAM. The model's R-squared value is 0.979, suggesting that the variables of music genre, emotion, mood-matching level, and emotion intensity collectively account for 97.9% of the observed variability in Music Memories.

The F-test for the model shows that it is statistically significant ($F = 1991.059, p = 0.000 < 0.05$), indicating that at least one of the variables, music genre, emotion, mood-matching level, and emotion intensity, has a significant relationship with Music Memories. Additionally, the VIF values of all variables in the model are less than 5, indicating the absence of multicollinearity. The Durbin-Watson (D-W) value is around 2, suggesting the absence of autocorrelation and no relationship among the sample data, indicating a good model fit.

The specific analysis reveals (table 4) that the regression coefficient for music genre of the song is 0.090 ($t = 51.434, p = 0.000 ** < 0.01$), for emotion is 0.095 ($t = 13.461, p = 0.000 ** < 0.01$), for mood-matching level is 0.093 ($t = 16.260, p = 0.000 ** < 0.01$), and for emotion intensity is 0.087 ($t = 55.296, p = 0.000 ** < 0.01$). This implies that all four factors have a significant positive impact on Music Memories.

5. Discussion

The findings of this study provide compelling evidence regarding the factors influencing music-evoked memory. Personal conditions of the listener, including the emotional experience and arousal level during music listening, appear to be critical determinants in shaping music-evoked memory. Additionally, the music selection itself assumes a significant role in the process: the mood-matching level of music is directly related to the vividness of music-evoked memory; diverse music genres evoke distinct emotional responses in listeners, ultimately yielding varying levels of music-evoked memory. This study has confirmed or supplemented similar studies on music-evoked

autobiographical memory. Such finding has proven the study of Janata on music-evoked autobiographical memory [10], in which the emotion type of the listener after exposure to the same music is examined with the majority of positive strong positive emotion and nostalgia. The result is also consistent with the study of involuntary retrieval in music-evoked autobiographical memory [11] while explaining the “other stimulus features” mentioned in the study. Overall, this research has deepened the current studies in the understanding of Music-Evoked Autobiographical Memory.

Meanwhile, there are certain limitations of the study that need to be identified. First, since the participants of the survey are all teenagers, and the entire study has been focusing on students from high school and college, the result can't be applied to people from all ages, thus the study has little use for the music intervention of Alzheimer's disease which is a common topic of music therapy. Second, the concept of music-evoked autobiographical memory is abstract, despite the efforts the author made to clarify and embody this concept, the results still can't explain the memory process in all scenarios. Third, the main method used in this study is survey which lacks objectivity. Thus, further researches on the brain mechanism of MEAM is needed for a more comprehensive understanding.

6. Conclusion

The findings of the survey suggest that the music genre, mood-matching level, emotion during listening, and emotion intensity have a significant positive impact on MEAM. This suggests that different music genres possess distinct emotional appeals, which in turn influence the level of activation and retention of memories associated with the music. For example, genres like rock or metal may evoke stronger emotions, leading to a deeper connection with the music and greater memory activation. Furthermore, the mood-matching level of a song plays a crucial role in memory formation. When individuals listen to music that aligns with their current mood, they experience a strong engagement with the music, facilitating a stronger bond between the individual and the musical content. Consequently, this enhanced engagement and emotional resonance result in a more effective retrieval of memories. The emotion experienced during listening also shows a significant impact on the memory process. To illustrate, according to the finding of Figure 6, positive experiences can lead to a broader emotional range and a deeper understanding of the intricacies of different emotions whereas negative emotional experiences may be more prone to feeling negative moods like sadness when listening to music again. Lastly, the high arousal level is proven to form a stronger MEAM. When individuals experience high arousal while listening to music, their memory formation is affected. Stronger emotions can enhance memory encoding processes, and emotional intensity associated with the music serves as a cognitive “tag,” aiding in the consolidation and retrieval of associated memories.

In addition, the study on the music content of the song has given result from a different perspective. The music itself also has influence on the listener's music-evoked memory. The title and lyrics of the song is the most important retrieval cue in music-evoked memory. They have the ability to form connection between the song and the listener's experience, and thus enhance the encoding and retrieval of memories.

This study on MEAM among teenagers has many future applications. The most important application is music therapy. The key concept in music therapy is to use music as a medium to help the patients to express themselves. Now with a further understanding of the music-evoked autobiography memory process, the therapists are able to select the most appropriate music piece for patients based on their past experience and their music preferences. Additionally, the findings can inform music education practices for high school students, enabling teachers to incorporate meaningful music into educational approaches to enhance students' learning, memory consolidation, and emotional engagement. Furthermore, the understanding of MEAM can offer valuable insights for

the design of music playlists on numerous music apps, allowing for personalized and emotionally resonant music experiences.

References

- [1] Haj, M. E., Postal, V., & Allain, P. (2012). Music enhances autobiographical memory in mild Alzheimer's disease. *Educational Gerontology*, 38(1), 30–41. <https://doi.org/10.1080/03601277.2010.515897>
- [2] Rauschecker, J. P. (2014). Is there a tape recorder in your head? How the brain stores and retrieves musical melodies. *Frontiers in Systems Neuroscience*, 8. <https://doi.org/10.3389/fnsys.2014.00149>
- [3] Peynircioglu ZF, Tekcan AI, Wagner JL, Baxter TL, Shaffer SD. Name or hum that tune: feeling of knowing for music. *Mem Cognit*. 1998;26:1131–1137. [PubMed] [Google Scholar].
- [4] Janata, P., Tomic, S. T., & Rakowski, S. K. (2007). Characterisation of music-evoked autobiographical memories. *Memory*, 15(8), 845–860. <https://doi.org/10.1080/09658210701734593>
- [5] Buchanan, T. W. (2007). Retrieval of emotional memories. *Psychological Bulletin*, 133(5), 761–779. <https://doi.org/10.1037/0033-2909.133.5.761>
- [6] Eschrich, S., Münte, T. F., & Altenmüller, E. (2008). Unforgettable film music: The role of emotion in episodic long-term memory for music. *BMC Neuroscience*, 9(1). <https://doi.org/10.1186/1471-2202-9-48>
- [7] Ward, E. V., Isac, A., Donnelly, M., Van Puyvelde, M., & Franco, F. (2021). Memory improvement in aging as a function of exposure to mood-matching music. *Acta Psychologica*, 212, 103206. <https://doi.org/10.1016/j.actpsy.2020.103206>
- [8] Citron, F., Gray, M. A., Critchley, H., Weekes, B. S., & Ferstl, E. C. (2014). Emotional valence and arousal affect reading in an interactive way: Neuroimaging evidence for an approach-withdrawal framework. *Neuropsychologia*, 56, 79–89. <https://doi.org/10.1016/j.neuropsychologia.2014.01.002>
- [9] Leunissen, J. M. (2023). Diamonds and rust: The affective ambivalence of Nostalgia. *Current Opinion in Psychology*, 49, 101541. <https://doi.org/10.1016/j.copsyc.2022.101541>
- [10] Janata, P., Tomic, S. T., & Rakowski, S. K. (2007b). Characterisation of music-evoked autobiographical memories. *Memory*, 15(8), 845–860. <https://doi.org/10.1080/09658210701734593>
- [11] Belfi, A. M., Bai, E., Stroud, A., Twohy, R., & Beadle, J. N. (2022). Investigating the role of involuntary retrieval in music-evoked autobiographical memories. *Consciousness and Cognition*, 100, 103305. <https://doi.org/10.1016/j.concog.2022.103305>