Participatory Artificial Intelligence Generated Music for Pressure Healing

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This study explores the potential of AI-generated music for stress reduction and healing in terms of the impact of social stress on mental health. After the COVID-19 epidemic in 2020, industrial and economic uncertainty increased dramatically, and the emotional and psychological state of individuals became a stressful phenomenon. Stress is perceived differently for each person, such as nervousness, unpleasant external forces, or non-specific reactions. Psychologists believe that stress is a stimulus that reflects the assessment of threat perception, coping patterns, psychological defense, and social environment. Stress encompasses biochemical, physiological, behavioural, and psychological changes. According to the World Health Organization, 70% to 90% of psychosomatic disorders are mainly caused by emotional stress and psychology. Therefore, music is a medicine for the soul, not only to make people feel better. The United States Psychological Association (APA) has studied that music can improve the body's immune system, reduce stress, reduce preoperative anxiety, and found that music can increase the body's immunoglobulin A and natural killer cells, and cells can attack viruses to improve the effectiveness of the body's immune system and reduce stress hormone cortisol content, so music has many benefits for body.

The objectives of this study : 1. To prevent psychological problems and alleviate stress, anxiety and underlying physiological conditions. 2. Using music as an emotional connection, comprehensively understand the crux of physiological and psychological states, design new strategies and methods, and develop a new type of music healing direction. The research process is divided into four steps, Step1: define the experimental question: the relationship between stress and music, and does music have the effect of relieving stress? Step 2: Experimental and Method Design: Experimental Design: (1) Music Editing (Test Materials) (2) Stress Assessment Form Test and Provide In-depth Interview Content Design on Stress Conditions and How to Cope with and Adjust to Stress (3) Conduct AI-generated Music Genre Tests and Responses ; The research method was participatory, qualitative and quantitative analysis. Step 3: Participant data analysis: (1) music samples and the subject's emotional response (2) comparison and analysis of the difference between the subject and the researcher in each generative AI music work, and measure whether the change in heart rate value is the influence of music with a simple physiological measuring instrument. Step 4: Constructing Patterns: Establish new vocabulary with specific emotions as a basis for subsequent testing, and concretize musical characteristics and structural elements into new definitions. Analysis of the results of this study: 1. Different music experiences can allow the parties to participate in the creation to achieve stress relief. 2. The measured values found that music helps to reduce heart rate, although the difference in the presentation of music works does not affect the final result, even if the produced music style is different, the emotional feelings and reactions are positive. Therefore, the conclusion of this study is that in the part of the stress assessment standard test and in-depth interview, there are three factors of stress: family, work, and interpersonal relationship, and the solution is that the participants use music as a medium to reduce stress and heal, which is also the most direct and fastest way to reduce the feeling of depression and negative emotional influence, and change their mood and adjust their mood to the most comfortable state through music. After the questionnaire interviews and experiences provided by the participants, the emotional response content was given, and new results were found, such as new music forms: bedroom, Lo-fi, Korea music, which did not appear in many previous research papers on related music genres. Experiment 2: The researchers and testers also found that: 1. Stress and music are positively correlated and connected.

2. Music can be designed according to personal preferences to achieve their own stress reduction effect, rather than being limited by a fixed form of music type. For the follow-up research, a new model criterion will be constructed: it can increase the emotional response of different test groups to music and introduce new music genres for in-depth discussion and research, find new opportunities and develop new musical perspectives.

1. Introduction

After the COVID-19 pandemic in 2020, industrial and economic uncertainty increased dramatically, and the emotional and psychological state of individuals became a stressful phenomenon. The World Health Organization recognizes that between 70% and 90% of psychosomatic disorders are mainly due to emotional stress and psychological stress. Music can uplift the mind, defeat depression, relieve pain, and promote physical and mental health. This study investigates the therapeutic potential of using AI-generated music to address the impact of social stress on mental health [18].

Provides comprehensive tools and techniques to help individuals better cope with stress and improve their overall physical and mental health. Combined with AI-generated music, it has attracted a lot of attention and research in the field of stress therapy. Previous research has mainly focused on the following aspects: 1. The emotional impact of music: to explore the impact of different styles and types of AI-generated music on the emotional state of individuals. Several studies have explored how specific musical elements and mood styles can effectively regulate the mood of subjects and help reduce stress and anxiety. 2. Music Therapy Effects: Many studies have explored the use of AI-generated music in stress therapy. The objectives of this study are: 1) to address the psychological aspects of preventive health care to reduce stress, anxiety, and potential physical risks, 2) to use music as an emotional connection tool to integrate psychopreventive care and mental health impacts, and 3) to enhance comprehensive health prevention to promote mental health. In addition, physiological measurements of the physiological response to AI-generated music: heart rate, which is used to evaluate the effect of AI-generated music on physiological responses. Provides objective indicators of the positive impact music has on stress levels. Based on the purpose of physical and mental health as the core of the pilot study, the research structure is designed as follows:

1.1 Precursor Experimental Studies

1.1.1Experimental problem setting: The relationship between stress and music? Whether the music has a stress-relieving effect ?

1.2 Experiments and Methods

1.2.1Music Clips (Test Data): The Stress Assessment Form tests and provides in-depth interviews on stress conditions and how they respond to and adjust to stress、AI-generated music genre testing and reactions

1.2.2Methods:Participatory study design、Qualitative Analysis、Quantitative Analysis.

1.3 Analyze the data (Test Results).

Music samples and testers emotional responses、The tester and the researcher each create an AI music work, compare and analyze the differences.、Measure whether there is a difference in heart rate and music through a physiological measuring device.

1.4 Follow-up study, Establish measurement standards.

Establish new vocabulary with specific emotions as a follow-up test standard.
Concretize musical characteristics and structural elements as a new definition.
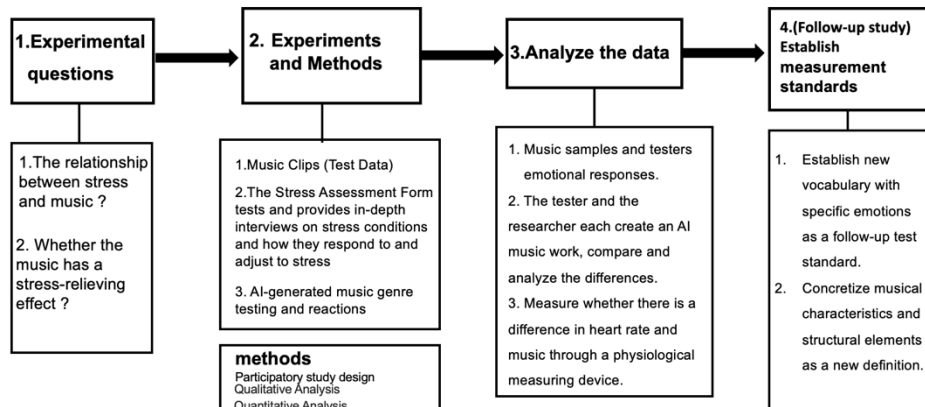

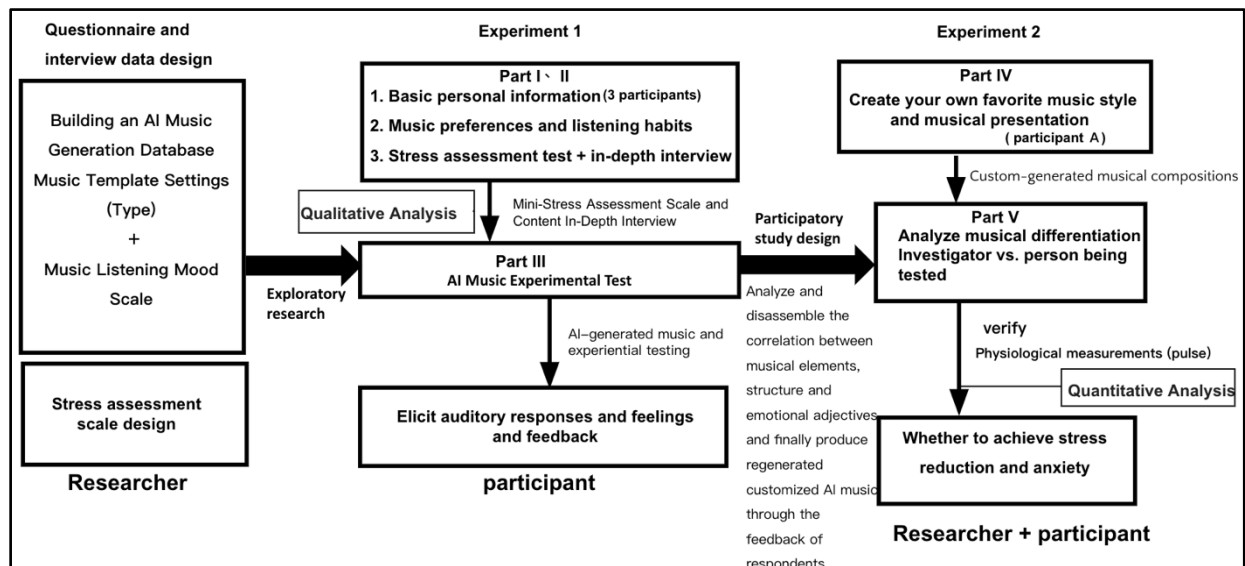**Figure 1: Schematic diagram of the pilot experiment**

Figure2：flow chart

2. Literature Review

AI-Generated Music- AIVA (Luxembourg)

The meaning of AIVA Artificial Intelligence Virtual Artist. AIVA is a start-up AI composition technology company founded in Luxembourg in 2016. The goal is to create an AI composition system that provides composers with tools to help them create ideas. At the same time, AIVA is also the world's first officially registered AI composer, AIVA is registered as a certified composer with the Society of Composers (SACEM) in France and Luxembourg. After training neural networks with a large amount of classical music and releasing his first album Genesis, AIVA slowly added training in various musical styles to create more diverse music. In the early stage, we mainly created customized music for customer needs, such as game background soundtracks, advertising soundtracks, theme songs performed on Luxembourg's National Day, and customized pop music for singers[19][20]. It is "algorithmic creation". Depending on the creative process, it can be classified as "computer-generated music". Using artificial intelligence technology and algorithms to create original music, imitate and learn the musical styles and techniques of human musicians, and generate new music based on this. The creative process reduces the need for manpower, time, and energy, and results in a rich, diverse musical composition.

Conception

a. Emotion generation: Some AI-generated music applications involve emotion generation of music that is sufficient to express a specific emotion or elicit a specific emotional response.

b. Personalized generation: Based on the user's personal preferences and characteristics, the generated personalized music experience is more suitable for individual needs.

c. Creativity and Exploration: Music generation methods usually involve the creation and exploration of the music creation process, enabling computer systems to generate musical compositions with distinctiveness[9][10].

3. Methods

3.1 Participatory research method

Participatory action research is a participatory democratic process that focuses on practical knowledge development. Collaborative research between partners is emphasized, recognizing that each partner has unique strengths, and that participants and researchers work together to identify problems, ask questions, and take action [10].

3.2 participators: 3 females (Participants A, B, C)

Age: 29 years (2, Participant A, Participant B) and 43 years (Participant C) 1

3.3 Tool

The design concept was to create AI-generated music samples [19], stress rating scale[15], feeling mood scale, and four forms as evaluation and measurement tools in AIVA, first to evaluate physiological factors, followed by in-depth interviews on psychological factors, and finally to use AI software tools to produce music compositions and evaluate emotional states through blood pressure and heart rhythm monitors.

3.3.1 Musical Elements

Music is a form of social behavior, through which people can communicate emotions and life experiences with

each other, and this role is most prominent in songs. The feeling presented by music is composed of three elements of music: melody, rhythm and harmony. Music style and genre play a key role in the music generation process of AIVA, and users provide clear style and genre requirements to help AI create music that meets the needs, the following is an explanation of the three elements of music: 1. Melody: The main line is composed of musical notes in sequence, which is the "sound" of music, which is known and remembered. Characteristics: (1) Emotional expression: convey various emotions: happiness, sadness, tension, and calmness, which are achieved through pitch changes and note selection. (2) Memory points: easy to be remembered and attract listeners. 2. Rhythm: The notes and time arrangement are the "heartbeat" of the music, which determines the flow and dynamics of the music, and the characteristics: (1) Time organization: The rhythm organizes the time of the music, provides a framework for the melody, and ensures that the music is presented in an orderly manner. (2) Emphasis and contrast: The strength and weakness of the beat can create a sense of tension or release. (3) Danceability: Many music styles rely on rhythm, which makes people's bodies swing naturally to the beat. 3. Harmony: The acoustic effect formed by multiple notes being sounded at the same time, providing background and overall musical support for the melody. Features: (1) Rich timbre: Enhance the depth and layering of music. (2) Harmony and dissonance: It affect the emotional expression of music, harmonious harmony gives comfort, and discordant harmony brings a sense of tension or unease. (3) Functionality: guide the development of the melody, create the musical structure and emotional atmosphere. Taking the AIVA style generation type as the main axis of the system, this study chooses to use two elements of music: melody (memory point) and rhythm (flow sense) as the core of the test genre to make music selection, and many common genres in the previous literature are used as the basis for research, such as: hip-hop, pop, jazz, electronic music, folk, rock, rhythm and blues, etc., this study is studying the diversity of generative AI music in adding different types of music: instrumental solo, epic, film, soundtrack, etc. For the generative AI music genre, from the selection of one to five songs, each piece of music is presented in a different way with different auditory and emotional expressions. Subjects are asked to judge according to their favorite genre in the test, and finally choose the one who likes the music type the most and expresses the feeling of emotional experience. Users can listen to the whole music through the genre music database and select, as shown below, set the type, the system will automatically generate all the styles of the relevant music, and so on different genre settings.
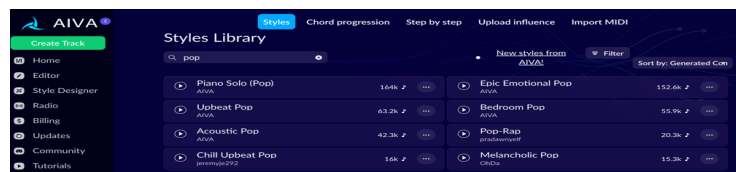

Figure3 : AIVA creates an interface for AI-generated music styling

3.3.2 Music Genres

The musical form is an art form with far-reaching significance, which can affect people's emotions and psychological strength, improve mood, and bring positive energy, which is an important feature, and each style has particularity and charm. Choose your favorite music style, know and understand different cultures and histories, and choose according to your emotional preferences, such as: relaxation, comfort, you can choose softer, pleasant melodies of jazz, folk, country music; If you need more energy, choose rock and hip-hop music with strong rhythm. For the selection of music, this study will make a brief discussion of the music type, style characteristics, musical expression mode and application field of the test music, and organize the relevant track tracks of the generative music database test in the following table.

Musical genre	Music characteristics / music expression	AI-generated music tracks
Pop Music	Pop is an abbreviation for popular, which means popular, popular music, known for its easy-to-remember melodies and touching lyrics, and it is also the most widespread music genre, sometimes called mainstream and pop music. Pop songs specifically refer to the lyrics that are mainly based on modern trends, such as: life, family affection, love narrative, etc. There are also substreams of pop music, such as: pop electronic, pop synthesizer, pop dance music, pop rock, etc., and the music presentation is dominated by modern pop instruments. Each country has its own pop music, and different countries have different styles, such as: J-pop is an indicator of Japan pop music: a song that originated in the Meiji era. C-POP is a Chinese pop music indicator, with Chinese music sung by singers from China, Hong Kong, Macao and Taiwan, including Singapore, Malaysia, Thailand and other characteristics, focusing on lyrics and melody display. K-POP is a Korea pop music category, including: dance music, modern rhythm and blues, pop electronic music, hip-hop music.	piano solo pop
		Bedroom pop
		chill upbeat Pop
		Upbeat Pop
		Pop Punk
		Epic Emotional pop
		Acoustic Pop
		Techno-pop
		Relaxing Electro Pop
		IDM-Techno-pop
		80's Tokyo Night Pop
Jazz	A style characterized by improvisation, rich rhythms, the creation of free melodies.	Jazz Lounge
		Paino solo
Orchestral	He often accompanies films and produces movie soundtracks. They usually play classical music or accompany opera, and sometimes pop music.	Orchestral Ambiant
		Playful Immersive
		Orchestral Cinematic

hip-pop	Hip-hop culture consists of rap, DJ, graffiti, hip-hop and *beatbox*, and hip-hop has evolved into a variety of genres and styles to become the mainstream of today's music market. Accompaniment is mostly produced by musical sampling, called "hip-hop music". Accompanied by a rhythmic chant that is rap in the style of rap music. Hip hop's Old School common style Boombap、Jazz Hip hop、G-Funk，Old school fixed single repetitive melody rhythm, Focusing on rhyme, the rhythm is basically based on 4 beats, embodying Flow, the subject matter is varied, and the strength is simple. Post-90s New school Freedom of expression。Jazz Hip hop ,The melody in the sample Jazz is more ethereal, provocative, not just a loop, but changes after a few bars.	Lo-Fi(Hi-Hop)
		Hip pop & Violions
		Dark Ambient with Hip-pop Spice-Fast
Folk/Country	This genre is a mix of folk, gospel and blues with guitar. The style and rhythm are generally simple, light, and catchy, and it is by far the most popular style in the United States.	Traditional Folk
		Punk Rock
		Rockweed
Electronic house	It belongs to electronic music styles, such as: Tiekno, house, ambient, jungle music style.	Ambient Electronic
		Electronic house
		New Age
Acoustic	Acoustic does not use electronic devices, it is not a genre, it is an expression and arrangement technique, and it is used in a variety of genres. It is characterized by the true timbre of pure piano, guitar and percussion instruments without plugging, and the humanistic spirit with a sense of simplicity. The original version of the song is designed to emphasize the human voice, and it is played with a simple instrument, the acoustic guitar.	Ambient Acoustic
Soundtrack	Song-Oriented Soundtrack Album, the soundtrack is the largest soundtrack type in the city, and it is the main force in the commercial market. Record music for films, TV dramas, radio dramas, cartoons, and video games. The original soundtrack songs are divided into original music to compose songs for the movie, and pre-existing music is selected to meet the needs of the story and drama. The purpose of the production is to restore TV and movies with theme music, so that people's emotions and memories can be reproduced.	Soundtrack（post-Apocalyptic）
		Spooky Horror Soundtrack
Epic Music	Characterized by classical music. It is characterized by a large symphony orchestra, a very imposing chorus, a clear hierarchy, a sense of space, a strong rhythm, a magnificent atmosphere, and a sense of indignation, often creating a magnificent mood and atmosphere. Most of the music features describe themes such as "war", "revolution", "heroic songs", and "war songs", and the music feels magnificent, passionate, blood-pumping, majestic, and mysterious. Such as: epic plots, fantasy, sci-fi, heroes, war movies.	Epic Orchestra (Modern cinemastic)
		Epic Dragon born (Fantasy)
		Dark Epic
		Epic world
		Epic cinematic Thriller
Cinematic	Cinematic soundtrack style.	Solo paino（soft）
		Solo paino
		Cinematic
		Synth wave
		String Ensemble
		Mallet
		Playful
Rock＆Roll	Rock 'n' roll: Guitar-dominated, often with a strong sense of rhythm. It is a dynamic and powerful style, with strong guitars, drums, and a way to express freedom and dissatisfaction through musical instruments, which is loved by young people. The rock band plays powerful music using electric guitars, bass and drums. There are many genres of rock music, such as: metal punk, punk, prog-rock, etc. Different types of rock music are popular all over the world. Funk rock in rock music does not emphasize melody, but focuses on bass and drums with a strong sense of rhythm.	Wylde Stallions(rock
		Punk Rock
		Rockweed

Table1: Music Genres and AI-generated music tracks

3.3.3 Test the music sample setting

In order to gain diversity and select different types of music, the researchers selected 11 genres as test samples from the many samples of the original AI, about 30 songs, such as: hip-hop, pop, jazz, folk, rock, instrumental solo, epic, movie, etc., each song has a different emotional expression. In this study, the primary objective of this study is to select the type of music that the subject prefers by breaking down information about the style of the system design to select the type of music that the subject prefers after choosing the style they like [19].
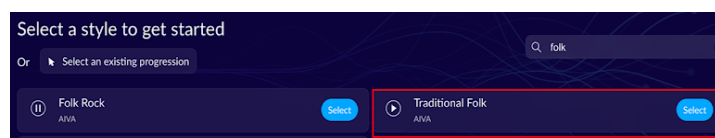

Figure4 : AIVA Creating AI-Generated Music Samples

5

3.3.4 Musical mood adjective vocabulary setting

When a piece of music is composed by musicians and composers, certain elements are used to convey a specific emotion or atmosphere, and when the listener listens to it, it will elicit a variety of emotional responses, and the psychological mechanisms that cause the emotions become more complex, esoteric and different from person to person. Therefore, this study summarizes the relevant emotional expression content mentioned in the previous literature into more complete specific words and expositions of musical emotional adjectives as a reference, so that the tester can clearly and completely state the emotional feelings and experiential responses, as shown in the following table [12][13].

	Musical mood (musical mood specified)		Auditory sensory response (physiological)	Emotional expression (adjective) (psychological)	Emotional orientation
1	Pleasant/cheerful	Music with a light rhythm and bright melody often makes people feel happy, happy or excited	Pleasure Happy	Happy, joyful, pleasant, joyful Intoxicated, adoring, passionate	Pleasure(+)
2	Exhilarating/excited	Music with strong rhythms and high energy that can feel uplifting, exciting or energizing	rouse	Excited, jubilant, energetic, uplifting	Pleasure(+)
3	Romantic/sensual	Music with soft melodies and sensual harmonies, often associated with love or romantic feelings	romantic	Romantic, tender, loving, sweet Gentle and soft	Pleasure(+)
4	Relax/soothe	Slow tempo, soft melodies and simple harmonies help create a relaxed, serene atmosphere	harmonious reverent calm	Peaceful, serene, soothing, smooth Tranquil, tranquil, peaceful, peaceful Calm and relaxed	Pleasure(+)
5	Melancholy/contemplation	Slow-paced, melodic music, often with sad or contemplative emotions	sadness depressed Pathos	Grief, Painful , sorrow, sadness Cool, lonely, sad, melancholy Pensive, melancholy, heavy, deep	Unpleasure(-)
6	Adventure/Fantasy	Adventure or fantasy ambient music, including symphonic or epic music	mysterious	Mysterious, magical, unknown, haze Suspenseful	Unpleasure(-)
7	Shock/Suspicion	Music with a sense of suspense and tension is often used in suspense genre media such as movies and games	agitated	Excited, nervous, anxious, restless	Unpleasure(-)
8	Fear/nervousness	Deep tones, intense rhythms, and complex harmonies can create feelings of fear, nervousness, or restlessness	rapid	Jumpy, unrestrained, compact	Unpleasure(-)

Table2 Music mood adjective

3.3.5 Stress Rating Scale

Stress assessment is when many people experience chronic stress, usually for a long period of time, such as when many stressors occur at the same time or when traumatic experiences are constantly reminded . Lin Wenzhi, Tang Shenghui, Tu Yunjin, Zhang Jinbiao (2010) The increase of work pressure produces negative emotions such as depression, anxiety, frustration, hopelessness, and physical and mental exhaustion, which leads to a decrease in job satisfaction. Persistent long-term stress can also lead to burnout, which refers to physical, emotional, intellectual, and spiritual exhaustion, resulting in a lower sense of personal fulfillment, emotional exhaustion, and a depressed personality. There are many kinds of trials in the course of your life, and they happen one after the other, such as: life changes (sudden death of relatives and friends, abnormal or absent physical functions, long-term care for the sick or disabled), changes in life patterns (marital crisis, job change)., environmental stress (economic pressure, debt), interpersonal relationship (romantic relationships, getting along with friends, communication between superiors and subordinates in the company) and other stresses. In the long run, it causes psychological stress and burden. This simple stress scale asks about personal feelings and thoughts in the past month, and is filled in according to the frequency of feelings or thoughts of a particular thought[4][15][21].To relieve the intensity of the pressure, the following table is a reference template.

Please circle the last month to half a year, and you are under stress ("0" pressure is very small, "4" pressure. is very high)

Number	Recall the frequency of each of the following situations over the past month	Never (0%)	Occasional (25%)	Sometimes (50%)	Frequently (75%)	Always （100%）
1	I often feel upset and lose my temper when I am frustrated.	0	1	2	3	4
2	I'm prone to arguments with others.	0	1	2	3	4
3	I feel like there's always something to do.	0	1	2	3	4
4	I don't think it's useful to try harder.	0	1	2	3	4
5	I feel like life is very hard.	0	1	2	3	4
6	I'm tired of life.	0	1	2	3	4
7	I always felt like I wasn't good enough.	0	1	2	3	4
8	I feel uneasy about things I can't grasp (nervousness and stress).	0	1	2	3	4
9	I'm always busy.	0	1	2	3	4
10	I often feel alone and lonely.	0	1	2	3	4
11	I do what I need to do right away, and I always know how to schedule it.	0	1	2	3	4
12	When I was in a bad mood, I couldn't relieve it, so I needed to use cigarettes, alcohol, drugs, snacks, etc. to suppress my anxiety.	0	1	2	3	4
13	There are always things in life that I can't put at ease.	0	1	2	3	4
14	The uncertainty of my life makes me anxious, and I feel guilty when I relax in my free time.	0	1	2	3	4
15	I'll do what I'm interested in	0	1	2	3	4
16	It is common to feel that difficult things are piling up and that you can't overcome them yourself.	0	1	2	3	4
17	I often feel frustrated and frustrated because things are not done well.	0	1	2	3	4
18	I'm not as motivated as I used to be.	0	1	2	3	4
19	I'm a nervous person.	0	1	2	3	4
20	I get angry because a lot of things happen that are beyond my control.	0	1	2	3	4

Scoring criteria: 0-28 normal pressure 、29-42 pressure is on the high side、43-56 Excessive pressure

Table3 Stress Assessment Scale [21]

3.3.6 Feeling Mood Scale

The following table template is used in the experimental 2-step evaluation form to examine whether there is a difference in emotional response after performing music creation according to the emotional rating scale used before and after music creation [14].

	Item	Not at All 0%	slight 25%	medium 50%	Harm 75%	Very powerful 100%
1	Feeling nervous, rapid and irregular heartbeat					
2	I feel like I'm prone to tantrums					
3	Feeling distracted and unable to concentrate					
4	Feeling irritable and anxious					
5	Feeling tired and unwell					

Table4 Feeling Mood Scale

3.3.7 A table of the four mechanisms by which music evokes emotions

This measurement table format specifically states the auditory experience during Experiment 1, and is designed with an imaginary perception of the specific statement in order to concretize the purchase experience.

Explain the Nouns：This description is provided for the Participants to explain when doing the music experience.[5][6][13]

Emotional Contagion	Musical Expectancy	Visual imagery	Episodic memory
(Musical Mood) **Psychosexual feelings** **After hearing, express feelings**	The imagery conveyed by music **Auditory _ expression of feelings**	**Images come to mind**	**Spatial scenes and past experiences**
Description People feel the emotions conveyed by the music and then internalize them.	Description In the course of a piece of music, whether it meets or violates the listener's expectations of the music, it may cause emotions.	Description When you hear music, you think of some visual images, and you feel emotionally associated with those visual images.	Description Music evokes memories of past experiences about oneself and evokes emotions associated with those experiences. Emotions are often present in our memories, so we can say that certain memories are "happy" or "painful".

Table5 Aggregate design of this study[13]

4. Experimental Procedure

Experiment 1

Part I : General Information、Part II : Mini-Stress Assessment Scale and In-depth Interviews、Part III : AI Music Testing and Auditory and emotional experience.

Experiment 2

Part IV : Researcher + Participant Each creates a piece of music that they feel can relieve stress、Part V : Analyze and compare the differences between the two music genres.

4.1 Part I: General Information

This part is the preliminary stage of the experiment, to understand the basic information of the participants, relevant music background, music habits, etc., as follows:

Participants: 3 females (Participant A、B、C), Age : 29 for 2 (Participant A、B)、43 for 1 (Participant C), Music Background : one music department (Participant A)、two non-music departments. (Participant B、C), Music experience : One has studied piano and cello for 7 years . (Participant A)、 The other two are shorter learners. (Participant B、C), Listening to music : 4-6 hours / day for one person. (Participant B) 、1-3 hours / day for two people. (Participant A、C) , Favorite style : All three love lyrical and pop songs, Favorite Genre : All three of them like Korean music. Dislike type : Heavy metal 、 Classical 、Chinese pop, Listening to music : After work, Resting and relaxing, Taking a bath, Listening to music experience : The three of them listened to the melody and rhythm.

Background	Participant A_ Master UX Designer (age29) Department of Music, Art	Participant B_ bachelor Service Industry (age29) Non-music Department, enterprise logistics management	Participant C_ bachelor Technology Industry (age43) Non-music Department, business management
1. Learn about the music experience	7 years in piano and 4 years in cello	Jazz drumming for 1 year	Piano 1 year, harmonica
2. The amount of time the music is used	1-3 hours (at least 1 time in 1-3 days) Use music App：Spotify	4-6 hours (once a day) Use music App：Spotify	1 hours (at least 1 time in 1-3 days) Use music App：KKBOX
3. The latest favorite style	Passionate classical music Lyrical songs POP	Indie music Bedroom POP Lyrical songs	POP Lyrical songs Metal, Rock (fast-paced)
4. Like the type / Don't like types	Japanese and Korean music /Heavy Metal Rock (Unacceptable Speed)	Japanese, Korean, Western, Thai, /Chinese pop music	Korean music, Chinese pop music, electronic music /Classical (Uninteresting)
5. The habit of listening to music	Quiet, when I take a break When I`m working	Wake up in the morning, after work, ride, take a shower	When relaxing and resting, I need to concentrate on listening to music
6. The experience of listening to music	Musical background (melody, rhythm) Musical content (lyrics, instruments)	When you are in a mood, you want to read the lyrics, you listen to music with headphones on late at night, and you want to hear how the instrument is expressed. Listen to the melody and rhythm first	Listen to the melody and rhythm of the music first

Table6 Personal Information

4.2 Part II: Pressure Measurement and In-Depth Interviews

There are many kinds of trials in the process of life experience, which occur one after another, such as: life changes (sudden death of relatives and friends, abnormal or absent physical functions, long-term care for sick family members or people with disabilities), life changes (marriage, job change, promotion), environmental pressure, changes in economic status (financial pressure, loans, debts), interpersonal relationships (romantic relationships, getting along with friends, communication between superiors and subordinates in the company) and other stresses. Over time, it can cause psychological stress and burden. This scale asks you how often you feel or think about a particular thought in the last month. Although some of the questions appear to be similar, they are actually different, so each question needs to be answered. Try to answer in a quick and unthinking way. There are the following five choices for each question in this section, please fill in according to the number and frequency of occurrence. Choose from 0 to 4 laps that best represents your stress response and state as follows: "0" never (0%), "1" occasionally (25%), "2" sometimes (50%), "3" always (75%), "4" always (100%).

Participant A : Score__50 (Stressful, source of stress: work)

Lack of self-confidence, self-identity, and frustration: When you are frustrated at work, it will affect your emotions and begin to reflect on your own problems, whether it is a personality influenced by your family growth background, and the influence of your parents' educational concepts (obedience and obedience) will lead to a lack of self-identity, no self-confidence, and negative emotions and self-isolation.

Number	Recall the frequency of each of the following situations over the past month	Never (0%)	Occasional (25%)	Sometimes (50%)	Frequently (75%)	Always （100%）
1	I often feel upset and lose my temper when I am frustrated.	0	1	2	③	4
2	I'm prone to arguments with others.	0	1	②	3	4
3	I feel like there's always something to do.	0	1	2	3	④
4	I don't think it's useful to try harder.	0	1	2	③	4
5	I feel like life is very hard.	0	1	②	3	4
6	I'm tired of life.	0	1	②	3	4
7	I always felt like I wasn't good enough.	0	1	2	③	4
8	I feel uneasy about things I can't grasp (nervousness and stress).	0	1	2	③	4
9	I'm always busy.	0	1	2	3	④
10	I often feel alone and lonely.	0	①	2	3	4
11	I do what I need to do right away, and I always know how to schedule it.	0	1	2	3	4
12	When I was in a bad mood, I couldn't relieve it, so I needed to use cigarettes, alcohol, drugs, snacks, etc. to suppress my anxiety.	0	①	2	3	4
13	There are always things in life that I can't put at ease.	0	1	2	③	4
14	The uncertainty of my life makes me anxious, and I feel guilty when I relax in my free time.	0	1	2	③	4
15	I'll do what I'm interested in	0	1	②	3	4
16	It is common to feel that difficult things are piling up and that you can't overcome them yourself.	0	1	2	③	4
17	I often feel frustrated and frustrated because things are not done well.	0	1	②	3	4
18	I'm not as motivated as I used to be.	0	1	②	3	4
19	I'm a nervous person.	0	1	2	③	4
20	I get angry because a lot of things happen that are beyond my control.	0	1	②	3	4

Table7 The results after the test

Participant B ：Score__33(Medium stress, source of stress: parents of the family)

Family Factors: 1.The way parents educate and influence people's personalities. 2. Loneliness in life: Absence of siblings.

Number	Recall the frequency of each of the following situations over the past month	Never (0%)	Occasional (25%)	Sometimes (50%)	Frequently (75%)	Always （100%）
1	I often feel upset and lose my temper when I am frustrated.	0	①	2	3	4
2	I'm prone to arguments with others.	0	①	2	3	4
3	I feel like there's always something to do.	0	1	②	3	4
4	I don't think it's useful to try harder.	⓪	1	2	3	4
5	I feel like life is very hard.	0	1	②	3	4
6	I'm tired of life.	0	①	2	3	4
7	I always felt like I wasn't good enough.	0	①	2	3	4
8	I feel uneasy about things I can't grasp (nervousness and stress).	0	1	②	3	4
9	I'm always busy.	0	①	2	3	4
10	I often feel alone and lonely.	0	①	2	3	4
11	I do what I need to do right away, and I always know how to schedule it.	0	①	2	3	4
12	When I was in a bad mood, I couldn't relieve it, so I needed to use cigarettes, alcohol, drugs, snacks, etc. to suppress my anxiety.	0	①	2	3	4
13	There are always things in life that I can't put at ease.	0	1	2	③	4
14	The uncertainty of my life makes me anxious, and I feel guilty when I relax in my free time.	0	1	②	3	4
15	I'll do what I'm interested in	0	1	2	③	4
16	It is common to feel that difficult things are piling up and that you can't overcome them yourself.	0	1	②	3	4
17	I often feel frustrated and frustrated because things are not done well.	0	①	2	3	4
18	I'm not as motivated as I used to be.	0	1	2	3	④
19	I'm a nervous person.	0	1	②	3	4
20	I get angry because a lot of things happen that are beyond my control.	0	1	②	3	4

Table8 The results after the test

Participant C ：Score__14

Light stress, sources of stress: children, work, interpersonal relationships

Number	Recall the frequency of each of the following situations over the past month	Never (0%)	Occasional (25%)	Sometimes (50%)	Frequently (75%)	Always （100%）
1	I often feel upset and lose my temper when I am frustrated.	0	1	②	3	4
2	I'm prone to arguments with others.	0	①	2	3	4
3	I feel like there's always something to do.	0	1	②	3	4
4	I don't think it's useful to try harder.	0	①	2	3	4
5	I feel like life is very hard.	0	①	2	3	4
6	I'm tired of life.	⓪	1	2	3	4
7	I always felt like I wasn't good enough.	⓪	1	2	3	4
8	I feel uneasy about things I can't grasp (nervousness and stress).	0	1	②	3	4
9	I'm always busy.	⓪	1	2	3	4
10	I often feel alone and lonely.	⓪	1	2	3	4

11	I do what I need to do right away, and I always know how to schedule it.	0	(1)	2	3	4
12	When I was in a bad mood, I couldn't relieve it, so I needed to use cigarettes, alcohol, drugs, snacks, etc. to suppress my anxiety.	(0)	1	2	3	4
13	There are always things in life that I can't put at ease.	(0)	1	2	3	4
14	The uncertainty of my life makes me anxious, and I feel guilty when I relax in my free time.	(0)	1	2	3	4
15	I'll do what I'm interested in	(0)	1	2	3	4
16	It is common to feel that difficult things are piling up and that you can't overcome them yourself.	0	(1)	2	3	4
17	I often feel frustrated and frustrated because things are not done well.	(0)	1	2	3	4
18	I'm not as motivated as I used to be.	0	1	(2)	3	4
19	I'm a nervous person.	0	(1)	2	3	4
20	I get angry because a lot of things happen that are beyond my control.	(0)	1	2	3	4

Table9 The results after the test

Small conclusion

According to the analysis of the evaluation results of the three participants, from the questionnaire test and in-depth interviews, it was learned that there will be stress in life, some are family, work, Interpersonal relationships, all three choose to use music as a medium as a tool to reduce stress and body, because the choice in music can state their current situation, achieve resonant feelings, can quickly move to the depths of the heart and can be converted into a positive energy frequency, therefore, this study analyzed that Participant A (unmarried, 29 years old, designer) stress showed half of the score, the score after the test was 50, the source of stress was work, and the part of Participant B (unmarried, 29 years old, service worker) was slightly lower, the score after the test was 33, the source of stress was family factors, and Participant C (married, 43 years old, technology industry) was the lowest, with a test score of 14, source of stress: work relationships. In response to the results of the test, a participant was asked to have an in-depth discussion with the researchers in Experiment 2 to create AI music, and physiological measurements were used to analyze and compare the differences before and after using music as a medium to reduce emotional stress. In this phase, Participant A will be involved in Experiment 2 Study, Factors: The expression of life stress is stronger and the feeling is more obvious, and the test will make the results more obvious. (See Figure 5).

4.3 Part III: AI Music Testing and Auditory and emotional experience

(Please refer to 3.3.1 for a description of the contents).The picture below shows the repertoire tested.
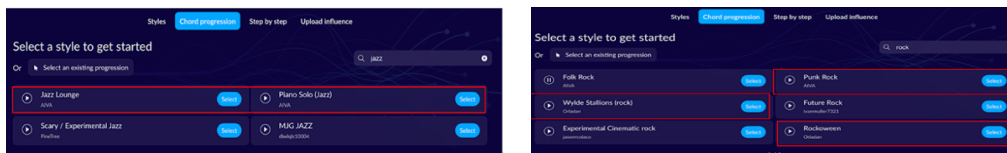

Figure5 sample setup and testing

4.3.1A vocabulary for Expressing emotions and feelings during musical experiences

Number	Type Features	AI-generated Music track	Participants	Emotional contagion	Musical Expectancy	Visual Imagery	Episodic Memory
				(Musical Mood) Psychosexual feelings	Music conveys imagery Auditory expression of feelings	Images come to mind	Spatial scene screen
1	8_Acoustic	Ambient Acoustic	Participant A				
			Participant B				
			Participant C				

Table10 Conduct an AI music test (Music Experience)

4.3.2 Testing - Conduct music testing and analysis of test results

The purpose of the emotional response measurement of the music test: to say the emotionally related words. after the test music after the musical stimulus response is not limited, and after the completion of each music test, the results are found to have auditory adjectives: relaxed, calm, comfortable. By post-feeling vocabulary, the music genre is pushed back to measure the new music type. The results of the three participants found that they felt the feeling of relaxation in the music. experience, type: Lo-Fi, Bedroom pop, electronic pop (The test results are shown below).

Musical style	Participants	Emotional Contagion	Musical Expectancy	Visual Imagery	Episodic Memory
		(Musical Mood) Psychosexual feelings	Music conveys imagery Auditory expression of feelings	Images come to mind	Spatial scene screen
Bedroom pop	Participant A	Joyful and relaxing	American rock	Rustic	When driving
	Participant B	Pleasant	Rustic feel	Country Movies	rustic
	Participant C	Joy	Relax and enjoy	Hualien seaside	When driving
Relaxing Electro Pop	Participant A (dislikes)	Funny	Classical with a modern twist	No picture	No picture
	Participant B	sensibility	No	To express an emotion	Emotional telling
	Participant C	Just relax	Plain	Plain	No picture
Lo-Fi (Hi-Hop)	Participant A	Dispirited	Dark decadence	People sit on the sofa in a nightclub, drink and chat	City
	Participant B	flexible	Slow pace	Relax and enjoy	No
	Participant C	peace	Calm and relaxing	No	No

Table11 Analysis of Test Results

4.4 Part IV: Comparison of music analysis by the Researcher and Participant A

Participant A's response to the test content, the right picture（Above） shows the simple table of heart rhythm test and emotional feelings before the test, and the left picture（Above） shows the researcher's test content response. The test process is divided into the pre-test heart rhythm score and emotional feeling immediate response, the next step is to start making music, and finally, through the presentation of music performance, the heart rhythm and emotional current feeling response are tested again, both heart rate decreases（Below）, and the emotional response scale also has a significant slowdown response.
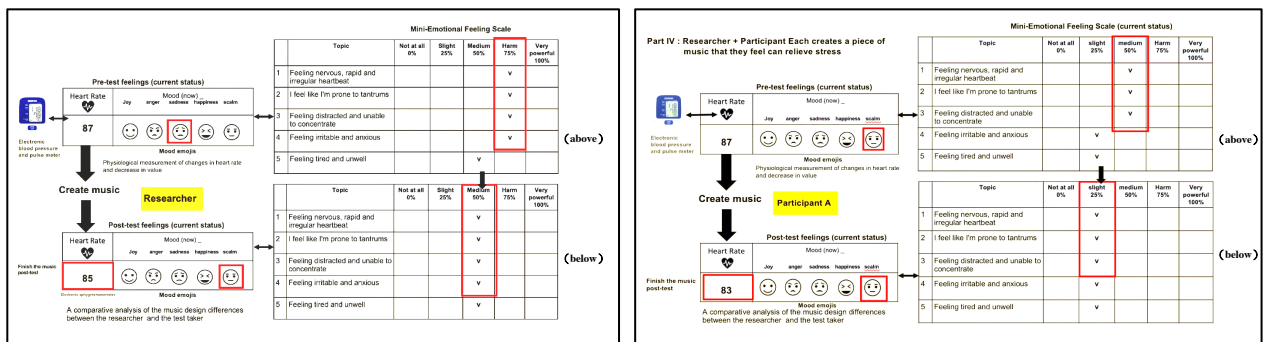

Figure 6 : The test process and the performance of the results _Researcher (Left) 、Participant Ａ(Right)

4.5 Part V : Analyze and compare the differences between the two music genres

The pictures below are all musical works by the participants and researchers, and the two musical expressions are the feelings of the participants after completing the musical feelings, and they are also expressing their own emotional reactions. Participant A's work, the feeling of making music is in the visual imagination, and the adjective is: the feeling of being vast and flying. In the researcher's musical works, music is expressed in the adjectives of visual imagination: relaxation, freedom, and a sense of ease.
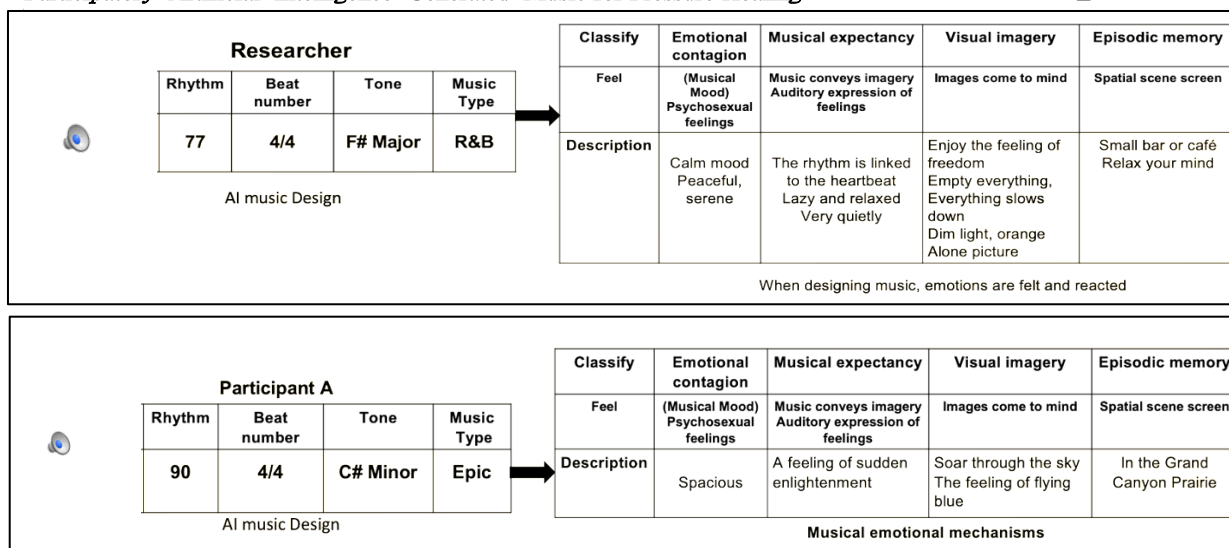
Figure7 : The test process and the performance of the results _ Researcher (above)、 Participant A (below)

5. Results

A. The feeling of different music can allow the parties to participate in the creation by themselves to achieve the effect of relieving stress. B. The pulse is measured with a simple blood pressure monitor, and music helps to lower the heart rate. C. In this study, we found commonalities in the emotional mechanism of music, such as "visual imagination" of music: "freedom, soaring in the sky", and "emotional feelings" feeling: "expansive, calm". In conclusion, in the differentiation of musical elements, the final difference result is not affected, even if the musical elements produced are different, they are all positive results in terms of emotional feelings.

			Auditory sensory response (physiological)	Emotional expression (adjective) (psychological)	Emotional orientation
	Musical mood (musical mood specified)				
1	**Pleasant/cheerful**	Music with a light rhythm and bright melody often makes people feel happy, happy or excited	Pleasure Happy	Happy, joyful, **pleasant,** joyful, Intoxicated, adoring, passionate **Participant A**	Pleasure(+)
2	**Exhilarating/excited**	Music with strong rhythms and high energy that can feel uplifting, exciting or energizing	rouse	Excited, jubilant, energetic, uplifting	Pleasure(+)
3	**Romantic/sensual**	Music with soft melodies and sensual harmonies, often associated with love or romantic feelings	romantic	Romantic, tender, loving, sweet Gentle and soft	Pleasure(+)
4	**Relax/soothe**	Slow tempo, soft melodies and simple harmonies help create a relaxed, serene atmosphere	harmonious reverent calm	Peaceful, serene, soothing, smooth, Tranquil, tranquil, peaceful, peaceful **Researcher** **Calm and relaxed**	Pleasure(+)
5	**Melancholy/contemplation**	Slow-paced, melodic music, often with sad or contemplative emotions	sadness depressed Pathos	Grief, Painful , sorrow, sadness Cool, lonely, sad, melancholy Pensive, melancholy, heavy, deep	Unpleasure(-)
6	**Adventure/Fantasy**	Adventure or fantasy ambient music, including symphonic or epic music	mysterious	Mysterious, magical, unknown, haze Suspenseful	Unpleasure(-)
7	**Shock/Suspicion**	Music with a sense of suspense and tension is often used in suspense genre media such as movies and games	agitated	Excited, nervous, anxious, restless	Unpleasure(-)
8	**Fear/nervousness**	Deep tones, intense rhythms, and complex harmonies can create feelings of fear, nervousness, or restlessness	rapid	Jumpy, unrestrained, compact	Unpleasure(-)

Table12 Music mood adjective

6. Conclusion

In the course of the experiment, the following conclusions were obtained: Experiment 1: Stress Assessment Form Test and In-depth Interview. There are two sources of stress : family, work and relationships. A. Family factors : a. It is different from the living habits of parents, The parenting style leads to a lack of self-confidence in the child. b. Children often get sick and can affect their mood. c. Loneliness in life: Living separately from one's siblings leads to loneliness in a life that no one can share. B. Work and interpersonal factors: Poor way of getting along with colleagues and communicating with supervisors can lead   to low mood. Ways to address stress : Music Healing : The most direct and fastest way to reduce low mood or negative emotions, and use music to change your mood and adjust yourself to the most comfortable state.

Based on the basic information provided by the participants and the emotional response vocabulary given after the music test and experience, the conclusion finally found that new music genres, such as Bedroom, Lo-fi, and K-pop music, have not appeared in many previous studies of related music genres.

Experiment 2 Part IV, V. In two musical compositions, the following results can be obtained: a. Stress and music are positively correlated and connected. b. Music can be designed through personal preferences to achieve their own stress relief effect.

Follow-up research: a. Conduct in-depth research on new music genres and styles, and identify new opportunities to get a different perspective on music. b. Participants were able to increase the male test and analyze and compare the differences between male and female expressions of musical emotions and vocabulary. c. Future research should improve text analysis methods to improve the accuracy of emotion extraction and the ability to identify topics.

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