EFFECTS OF IMPROVISATIONAL CHINESE BAMBOO FLUTE COURSE ON AUTISTIC TRAITS, EMOTION REGULATION, AND PERCEIVED STRESS AMONG THE MUSIC MAJOR UNIVERSITY STUDENTS IN HUNAN PROVINCE, CHINA

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by

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LIST OF ABBREVIATIONS

AQ-28	Autism Spectrum Quotient-28
ASC	Autism Spectrum Condition
ASD	Autism Spectrum Disorder
CDC	Centers for Disease Control
ERQ	Emotion Regulation Questionnaire
PSS	Perceived Stress Scale
PERMA	Positive Emotion, Engagement, Relationships, Meaning, and Achievement
IPS	Institut Pengajian Siswazah
USM	Universiti Sains Malaysia

LIST OF APPENDICES

KESAN KURSUS SERULING BULUH CINA BERIMPROVISASI TERHADAP TRET AUTISTIK, REGULASI EMOSI, DAN JANGKAAN STRES DALAM KALANGAN PELAJAR UNIVERSITI BIDANG MUZIK DI WILAYAH HUNAN, CHINA

ABSTRAK

Kajian ini meneroka kesan kursus seruling buluh improvisasi Cina selama 12 minggu ke atas pelajar muzik universiti tahun pertama, menganalisis perubahan dalam ciri-ciri autistik, regulasi emosi, dan tekanan yang dirasai. Penyelidikan ini menggunakan data kuantitatif yang dikumpulkan melalui soal selidik sebelum dan selepas kursus serta data kualitatif yang diperoleh melalui temu ramah separa berstruktur berdasarkan model PERMA. Kajian kaedah campuran ini melibatkan 33 orang pelajar dari sebuah universiti di Wilayah Hunan.Dapatan kajian menunjukkan bahawa 30% peserta memaparkan tahap ciri-ciri autistik yang tinggi pada peringkat awal. Analisis selepas kursus menunjukkan perubahan positif yang signifikan dalam dimensi rutin dan imaginasi bagi peserta yang menunjukkan tahap ciri-ciri autistik yang tinggi. Dari segi regulasi emosi, penurunan ketara dicatatkan dalam penggunaan penahanan ekspresif dalam kalangan peserta dengan ciri-ciri autistik yang tinggi, manakala efikasi kendiri meningkat secara signifikan, menunjukkan kemahiran pengurusan tekanan yang lebih baik.Pandangan kualitatif yang diperoleh melalui temubual berdasarkan model PERMA mengukuhkan dapatan ini, dengan menonjolkan bagaimana kursus ini berjaya meningkatkan regulasi emosi dan memberi kesan positif terhadap pengurusan tekanan serta ciri-ciri autistik. Dapatan kajian ini menyokong integrasi pendidikan muzik seperti kursus seruling buluh improvisasi Cina sebagai

sebahagian daripada kurikulum universiti untuk memupuk perkembangan emosi dan psikologi pelajar muzik. Secara keseluruhannya, penyelidikan ini memperkayakan bidang muzik dan pendidikan inklusif dengan menunjukkan bagaimana pendekatan pedagogi yang adaptif dapat secara berkesan menyokong kejayaan akademik, pertumbuhan peribadi, dan kesejahteraan keseluruhan dalam kalangan pelajar muzik peringkat universiti, khususnya bagi mereka yang memaparkan ciri-ciri autistik yang tinggi.

EFFECTS OF IMPROVISATIONAL CHINESE BAMBOO FLUTE COURSE ON AUTISTIC TRAITS, EMOTION REGULATION, AND PERCEIVED STRESS AMONG THE MUSIC MAJOR UNIVERSITY STUDENTS IN HUNAN PROVINCE, CHINA

ABSTRACT

This study explores the effects of a 12-week improvisational Chinese bamboo flute course on first-year university music students, analyzing changes in autistic traits, emotion regulation, and perceived stress. The research utilized both quantitative data collected through standardized questionnaires before and after the course and qualitative data gathered from semi-structured interviews guided by the PERMA model. A mixed-methods approach was employed on a sample of 33 students from a Hunan Province university. The findings showed that 30% of participants exhibited high levels of autistic traits at baseline. Post-course analysis revealed significant improvements in routine and imaginative dimensions for individuals with high autistic traits. In terms of emotion regulation, expressive suppression decreased significantly among those with higher autistic traits while perceived self-efficacy increased markedly, indicating better stress management skills. Qualitative insights gained from in-depth interviews based on the PERMA model further enriched these results by highlighting how this course improved emotion regulation and positively impacted stress levels as well as autistic traits. These outcomes support incorporating musical education like improvisational Chinese bamboo flute courses into university curricula to foster emotional and psychological growth among music major students. In summary, this research enriches the field of music and inclusive education by showcasing how adaptive pedagogical approaches can effectively foster academic

success, personal growth, and overall well-being among music majors at the university level, particularly for those students who exhibit high autistic traits.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Music plays an important role no matter what the occasion. Music affects our emotions in one way or another. Using music to regulate emotions is common for many music lovers, and even listening to music during leisure time can be an indispensable part of life. The first World Conference on Arts Education, held in Portugal in 2006, developed The Road Map for Arts Education, which included guidelines for music education. The Road Map for Arts Education (2006) defines the purpose of arts education, emphasizing "high-quality arts education that promotes emotional development and enhances students' internal satisfaction, physical and mental health, independent thinking and other feelings that create an enjoyable and satisfying course environment." Arts education, such as music education, is instrumental in developing individual abilities.

Autism Spectrum Disorder (ASD) is a variety of pervasive developmental disorders with impairments in social interaction activities with stereotyped and repetitive behaviors, including primarily autism, Asperger's syndrome, and undifferentiated pervasive developmental disorders. Autistic trait is a new concept extended from autism spectrum disorders (APA, 2000). Autistic traits are persistently distributed in the population and are present not only in individuals with autism but also in the general average population. People possessing significant autistic characteristics yet not fulfilling clinical diagnostic standards demonstrate behaviors akin to, but less pronounced than, those with autism, specifically in areas of social engagement, communication abilities, and behavioral tendencies (APA, 2013). Autistic traits encompass a spectrum of personality, behavioral, and cognitive features,

which are similar to the characteristics of individuals who have the clinical diagnosis of autism spectrum disorder (ASD). It is essential to highlight that while autistic traits share specific characteristics with ASD, having autistic traits does not necessarily imply a diagnosis of ASD. The autism spectrum model emphasizes a continuum of traits that exist in the general population, challenging the notion that autism is a distinct clinical condition separate from typical development (Baron-Cohen et al., 2001). In higher education, individuals with elevated autistic traits may manifest features related to social interactions, communication, and behavior. Therefore, it is noteworthy to distinguish autistic traits in neurotypical university students from a clinical diagnosis of ASD.

There are increasingly more studies that explored the factors associated with autistic traits in neurotypical students, revealing correlations with increased feelings of loneliness, fewer and shorter friendships (Jobe & White, 2007), as well as higher levels of depression (White et al., 2011). Additionally, these traits have been linked to heightened social anxiety, hostility, and aggression (White et al., 2011; 2012) in the university setting. Students exhibiting high levels of autistic traits may encounter social and emotional challenges during their university experience (Magurandam, 2020). Understanding and recognizing these traits in the neurotypical population can contribute to a more inclusive and supportive educational environment that caters to a diverse range of characteristics and needs among students.

For a long time, society's emphasis on academic performance has led teachers to focus only on cognitive education and parents to care only about intellectual development and academic performance, often neglecting the development of emotional management (Sun, 2019). However, emotions affect cognitive course and

behavioral performance. In the context of higher education, teachers and parents usually only notice emotional problems when university students show severe psycho-social problems such as depression and anxiety disorders (Liu, 2018). Therefore, it is essential that university students, especially those with high autistic traits, are introduced to positive ways of expressing their feelings and regulating their emotions as a way to avoid emotional outbursts and cultivate a positive sense of responsibility and self-fulfillment (Zhao, 2017).

Emotion is a state of arousal that arises when an individual is stimulated in some way, which the individual experiences but is not easily controlled by the individual, and which interferes with or facilitates the individual's behavior, leading to changes in the individual's physiology and behavior (Tyng et al., 2017). The concept of emotion regulation is crucial for university students. According to Gross's theory of emotion regulation in 2003, strategies for managing emotions can be generally categorized into two types: those focused on the antecedent and those focused on the response. This includes the two distinct strategies of cognitive reappraisal and expressive suppression. In this study, we specifically examine the impact of a bamboo flute course on the emotion regulation strategies of university students majoring in music, focusing on cognitive reappraisal and expressive suppression as outlined by Gross. The course, designed to integrate musical practice with emotional elements, provides an opportunity to observe how engagement in artistic activities influences students' ability to regulate their emotions. By exploring the changes in cognitive reappraisal and expressive suppression before and after the course, this research aims to deepen our understanding of the role of music education in fostering practical emotion regulation skills, which are crucial for the mental health and academic success of university students.

Cognitive reappraisal, a concept defined by Gross (2003), is a strategy used before fully developing an emotional response. It involves altering a situation's perception to change the ensuing emotional reaction. The premise here is that our interpretations of events shape our emotional responses. Cognitive reappraisal, which involves altering one's perspective on a situation, for instance, viewing a stressful event as a challenge rather than a threat, can change the type and intensity of emotions, typically resulting in more favorable outcomes. Expressive suppression, in contrast, is a technique applied after emotions have arisen, aiming to control their external display (Gross, 2003). This method does not alter the internal emotional experience but regulates outward expression. While effective for short-term emotional management, Gross (2003) suggests that habitual use of expressive suppression may negatively impact long-term psychological health and social interactions, potentially diminishing positive emotional experiences and increasing stress levels.

University students and society must deal with a complex blend of competitive, technological, multicultural, and crisis-related pressures. (Barbayannis, 2022). According to Cohen et al. (1983), the impact of stress on an individual can be either positive or negative, depending on how the person interprets the stressful event. Building upon this perspective, Cohen et al. (1988) proposed that perceived stress comprises two dimensions: perceived helplessness and perceived self-efficacy. Perceived helplessness describes an individual's sense of powerlessness and lack of control in the face of stress and is often associated with negative emotions and mental health problems (Miller & Seligman, 1975).

On the contrary, perceived self-efficacy represents an individual's belief in their ability to handle stress and is linked to effective coping strategies, positive emotions,

and overall mental well-being(Caprara et al., 2022). Collectively, these two concepts highlight the intricate connection between an individual's perception of stress and their ability to cope with it effectively. In this context, our study focuses on the effects of an improvisational bamboo flute course on the perceived stress levels of music major university students. By integrating this unique musical training into their curriculum, we aim to explore whether such artistic endeavors can enhance their perceived self-efficacy, reduce feelings of helplessness, and thus positively influence their overall mental health and resilience in the face of academic and performance-related stressors. This approach contributes to understanding stress management in a specialized educational setting. It adds to the broader discourse on the therapeutic benefits of music education in enhancing student well-being.

The PERMA model, formulated by positive psychologist Martin Seligman (2011), is a theoretical construct designed to encapsulate the multifaceted aspects of well-being and happiness. The model outlines five fundamental pillars: Positive Emotion (P), Engagement (E), Relationships (R), Meaning (M), and Achievement (A), each representing a vital component of psychological flourishing. This study leveraged the PERMA model as an analytical tool to qualitatively examine the experiences of music major university students who engaged in an improvisational Chinese bamboo flute course and how this engagement subsequently influenced their well-being.

1.2 Background

This study focused on music primary university students. In general, university students who have recently transitioned from late adolescence to early adulthood face significant life and psychological changes, making them susceptible to depression (Park et al., 2020). In general, university students who have recently transitioned from

late adolescence to early adulthood undergo substantial life and psychological changes, which can make them more susceptible to emotional instability(Park et al., 2020). This pivotal developmental phase highlights the importance of comprehending mental health challenges within this demographic. While many studies have investigated autistic traits in students pursuing science-related fields, particularly engineering, a noticeable research gap exists concerning music majors (Habe et al., 2023). In China's higher education context, music major courses encompass various theoretical disciplines dedicated to music, requiring students to acquire extensive knowledge in music history, theory, Chinese and foreign folk music, and music aesthetics. These courses require the students to have proficiency in playing instruments, notably the piano, and a foundational grasp of composition techniques.

The existing disparity in research underscores the urgent need to address the unique psychological health challenges faced by music students during their transition to adulthood. Zhang Weiliang (2011), a distinguished Chinese flute and xiao performer, professor, and doctoral supervisor at the China Conservatory of Music, makes a significant contribution in this area. In his seminal work, "Study on Bamboo Flute Art," Zhang identifies common personality traits among music-significant students, providing invaluable insights into their distinct psychological characteristics. His findings reveal that these students typically exhibit optimism, cheerfulness, and generosity, characterized by warm interpersonal relationships and ease of social interaction. They display cooperative and adaptable natures and strong communication and expressive abilities. However, Zhang (2011) also notes a pronounced sense of individualism among these students, marked by a preference for solitude and resistance to constraints, paralleled by a lack of robust self-management and disciplinary

adherence in academic settings, often manifesting as tardiness and laxity in study discipline.

Furthermore, Zhang (2011) observes a propensity among these students for one-to-one interactions over team-based activities, indicating a distinct communication and behavioral pattern. This research emphasizes the importance of tailored psychological interventions for majormusic students. It lays a foundational understanding of their needs and characteristics, which is crucial for devising effective support mechanisms.

According to Gooding and Standley (2011), the year-round one-on-one lecture format tailored for music majors, coupled with students' consistent after-school practice routines, contributes to developing a mindset that is particularly adept at approaching tasks with a focused and individualized perspective. Furthermore, music major university students harbor a robust inclination towards performance, fostered by their frequent engagements on stage. This desire to perform is often deeply rooted in their early exposure to the arts and is accentuated by their advantageous personal circumstances. As a result, many majormusic students naturally possess an inherent sense of superiority and tend to exude a strong sense of self-confidence (Li & Hu, 2023). This combination of specialized training, consistent practice, and a deep-seated passion for performance shapes the unique characteristics observed among significant music students. In this regard, more information and comprehensive insight into the emotional intelligence of students majoring in music remain to be discovered.

Emotional regulation, which includes the cultivation of positive emotions and transforming negative emotions into opportunities for personal growth, is increasingly recognized as vital for mental well-being (Li, 2017). In this context, the "2022 China National Mental Health Report," encompassing a wide-ranging survey of nearly

80,000 university students aged 15-26 from 31 provinces, autonomous regions, and municipalities, including Shandong and Hebei, becomes particularly relevant. This comprehensive report assessed aspects such as lifestyle, academic career planning, and romantic psychology alongside the risks of depression and anxiety. It found that while the general mental health status of these students is primarily positive, a significant portion, approximately 21.48%, are potentially at risk for depression and 45.28% for anxiety.

Given these findings, the importance of improving emotional regulation skills among university students is evident. For students, particularly those with high autistic traits, who might struggle more with emotional regulation, learning to manage and control emotions through rational methods effectively is vital for cultivating a positive outlook on life and enhancing social adaptability. Therefore, strengthening these skills is a critical step towards ensuring the overall mental health and social well-being of university students in China. According to Maslow (1954), the most important criteria for psychological health are maintaining good interpersonal relationships and moderate expression and control of emotions. This suggests that there is a direct link between emotions and mental health. Positive emotions are very effective in promoting physical and mental health. When a person is in a negative mood, such as depression, he or she suffers some degree of physical and psychological damage. If a person is in a depressed mood for an extended period without timely adjustment, it may lead to dysfunction of the nervous system and endocrine function.

People with better emotion regulation skills exhibit better social competence and less problematic behaviors in social interaction situations than those who are often in a negative state. Rubin et al. (1995) found that children who lacked emotion regulation

skills were more susceptible to negative parental evaluations and peer rejection, which could affect their healthy development in areas such as socialization. Therefore, university students, especially those with high autistic traits, should develop emotion regulation skills to improve their social adjustment (Mazefsky et al., 2013) and stress management (Muniandy et al., 2022).

The PERMA model, developed by positive psychologist Martin Seligman (2011), provides a comprehensive framework for understanding well-being through five dimensions: Positive Emotion, Engagement, Relationships, Meaning, and Achievement. This model is particularly relevant to the study of autistic traits, as it addresses key areas that can help individuals with high autistic traits improve emotional regulation and social adaptability (Mazefsky et al., 2013). For instance, the dimensions of Positive Emotion and Relationships can aid individuals with autistic traits by fostering positive emotional experiences and establishing meaningful social connections, both of which are essential for overcoming challenges in emotional regulation (Seligman, 2011; Mazefsky et al., 2013). The Engagement dimension encourages sustained focus and immersion in activities, which can alleviate anxiety and enhance self-efficacy (Henry et al., 2021). Furthermore, the Meaning and Achievement dimensions provide individuals with a sense of purpose and accomplishment, which can strengthen their self-identity and contribute positively to their mental health (Jones & Frederickson, 2010). By integrating the PERMA model as a theoretical foundation, this study aims to explore how participation in a bamboo flute course may support music major students with autistic traits in their emotional regulation and psychological well-being.

This music possesses the capacity to regulate emotions and serves as a valuable tool for emotional management. Cook (1959) argued that using music to evoke emotions in listeners is a fundamental principle of music. Juslin (2013) further argued that the value of music is in evoking emotions. One way to regulate emotions and manage stress is by engaging in musical activities (Henry et al., 2021). Many individuals with autism or with high autistic traits remain intact musically (Sivathasan et al., 2021) and even love activities such as playing instruments and singing (Heaton, 2009). The positive response of individuals with autism to music suggests that music-based interventions may have a therapeutic effect on their autistic condition (Ke et al., 2022).

There are many therapeutic tools in the broad field of music therapy, and the Chinese bamboo flute is one of them. In China, the art of the Chinese bamboo flute, an essential part of our traditional culture, has been a treasure of Chinese civilization for 5,000 years. Three main techniques are commonly used in bamboo flute playing: breathing, fingering, and tongue exhalation. Playing the Chinese bamboo flute is a simple and convenient exercise course not affected by weather or venue. It improves lung capacity, promotes blood circulation, strengthens the immune system, and is suitable for physical and mental health. A bamboo flute is a good tool for the hands, brain, and qi-energy (Zhao, 2000). In addition, Chinese scholars report that practicing the Chinese bamboo flute can improve personal cultivation and cultural qualities, develop intelligence, foster coordination, build endurance and confidence, study, and, most importantly, adjust the mind and relieve stress and worry (Hu, 2000).

Music therapy has matured into a well-established discipline, offering relief and treatment to many individuals with mental illnesses. Currently, three types of music

therapy approaches are commonly used: receptive music therapy, recreative music therapy, and improvisational music therapy. Improvisational music therapy is improvisation-based with solid traits of spontaneity, creativity, and communication (Geretsegger et al., 2014). Improvisational music therapy is standard in Europe and the United States (Finnerty et al., 2023). In some European countries, music therapy is equivalent to improvisational music therapy (Raglio, 2022).

Improvisational music therapy, by definition, involves the spontaneous creation of music without predetermined forms, themes, or melodies. The primary focus is on using contextually relevant music that meets the moment's therapeutic needs (Geretsegger, 2012). This therapy is particularly effective in assisting and guiding autistic children to articulate their innermost thoughts and enhance their musical abilities. Through improvisational music therapy, children with autism can learn to express themselves more fully and authentically. Additionally, this therapeutic process aids in building positive interpersonal relationships and provides a platform for projecting the true inner thoughts of the autistic child (Keates, 2022).

The choice of the Chinese bamboo flute as the primary instrument for this study is based on its unique cultural, therapeutic, and practical qualities that set it apart from other musical instruments. Unlike many other instruments, the bamboo flute is deeply embedded in Chinese cultural heritage and traditional music, making it a culturally relevant tool for Chinese university students (Zhang, 2011). The bamboo flute’s distinctively rich and mellow tones are particularly effective for emotional expression, which can aid in emotional regulation and mental relaxation (Huang, 2022). Additionally, it is relatively easy to learn and does not require extensive physical exertion, which makes it accessible to students with varying levels of musical

experience (Wu, 2019). This accessibility, combined with its connection to traditional Chinese values and its demonstrated therapeutic benefits, provides a compelling reason to focus on the bamboo flute in this study. Culturally relevant instruments like the bamboo flute can enhance students' engagement and help foster a stronger sense of identity and emotional connection, which are crucial for interventions targeting mental well-being (Li, 2020).

1.3 Problem Statement

The high school entrance exam is a crucial moment in China, often seen as a life-changing event. High school students endure significant academic pressure. However, when they enter university, they often feel out of place. To cope with real-life conflicts, many university students turn to the internet, which temporarily helps but weakens their social skills and makes them more susceptible to mental health issues (Snyder et al., 2015). The 2020 China National Mental Health Report is concerning, showing that young people commonly experience anxiety and depression. It found a 24.5% detection rate of depression among adolescents and a similar 24.6% rate among university students, indicating a high occurrence of depression. Psychological problems in university students have been increasing, especially in the last three years. The COVID-19 pandemic has worsened mood swings and added stress to their mental health and crisis support. This study aims to investigate the impact of such challenges on the autistic traits, emotion regulation, and perceived stress of university students in China, focusing on the effects of a Chinese bamboo flute course on music major university students, especially those with high autistic traits.

Autistic traits are considered a continuum in the general population (Happé & Ronald, 2008; Constantino, 2011). The extent to which a person possesses autistic

traits can be assessed using the Autism Spectrum Quotient (AQ) (Baron-Cohen et al., 2001). The AQ is a self-report questionnaire, with higher scores indicating more autistic traits and lower scores indicating fewer autistic traits. In universities, past research has shown that a significant number of students have high levels of autistic traits (McLeod & Anderson, 2022). In the study conducted by Huo et al. (2020) in China, the probability of university students being at risk for ASD was 4.7%, while data from the Centers for Disease Control and Prevention indicate that one in 68 children may have ASD, with a prevalence rate of about 1.47%. The results of Huo et al. (2020) suggested a higher prevalence of ASD among university students; possibly, many students with high autistic traits do not obtain a formal diagnosis.

Individuals with high autistic traits are more frequently diagnosed with depression and anxiety than their normally developing peers (Rosenau et al., 2023).Low et al. (2023) found that students with very high autistic traits were less satisfied in university than other students. The transition to university can be stressful (Worsley et al., 2021) as students leave their established social networks at home, adjust to living independently, and make new connections to integrate into the university community (S. K. Henry, 2012). This, students who are experiencing high levels of social anxiety (Tan et al., 2023) or social communication differences and preferences for sameness, such as high levels of autistic traits (Jobe & Williams White, 2007) may find such changes in social networks particularly challenging, which in turn may influence university transition outcomes.

In China, university students face escalating academic, social, and personal pressures, leading to increased stress levels and mental health challenges. Transitioning from high school to university often brings a heavier academic workload,

heightened competition, and the challenge of adjusting to new social environments. Additionally, the societal and familial expectations to succeed and secure a prosperous future career add to this stress. Therefore, exploring the potential use of music therapy to reduce stress among university students in this context is one of the main focuses of this study.

Considering this, the discovery that 58.97% of 312 surveyed undergraduate students utilize music as a stress relief method, as reported by Zhu (2022), underscores the potential of using music for stress management. Music offers a non-invasive and easily accessible avenue for alleviating stress, providing emotional comfort, mitigating physiological stress symptoms, and diverting attention from stress-inducing thoughts (Chen, 2023). Considering the prevalent use of music for stress relief among students, there is a strong argument for integrating music-based interventions into university programs. While music psychologists have consistently highlighted the profoundly social aspect of musical engagement, the interpersonal consequences of musical involvement should be considered minor. Considering that emotion regulation problems and stress are affecting many university students with autistic or highly autistic traits (Mazefsky & White, 2014; McLeod & Anderson, 2022), it is timely to explore whether musical activities such as Chinese bamboo flute course can alleviate these distressing problems they face.

The PERMA model, conceived by Martin Seligman (2011), provides a robust framework for evaluating well-being through five key elements: Positive Emotion, Engagement, Relationships, Meaning, and Achievement. Despite its potential applicability in diverse contexts, its integration with specific psychological assessments in music education must be represented in scholarly literature. This

consideration is particularly evident when considering the potential correlations between the PERMA model's domains and the constructs measured by instruments such as the Autism Spectrum Quotient (AQ), the Emotion Regulation Questionnaire (ERQ), and the Perceived Stress Scale (PSS). This study is essential as it could confirm the effectiveness of the PERMA model as an all-encompassing instrument for evaluating how arts education influences student well-being. This might guide the creation of curriculums that enhance not only academic and musical skills but also students' overall psychological and emotional growth.

As a representative of Chinese music culture, the Chinese bamboo flute has traditionally served as a means for expressing emotions and has enjoyed widespread popularity. This adaptable instrument is suitable for both solo performances and ensemble participation, providing a wide range of flexibility. It holds a significant position among Chinese musical instruments, allowing players to channel their creativity and serving as a vehicle for emotional expression and the preservation of national culture. To safeguard the continuity of traditional skills associated with the Chinese bamboo flute, two common approaches have emerged: first, integrating it into band rehearsals to incorporate corresponding solos, repertoire, and unison performances; second, diversifying its performance by combining bamboo flute music with other art forms (Huang, 2022). Hence, leveraging the Chinese bamboo flute for music therapy is believed to enhance emotional well-being and stress relief among music major university students, especially those with high autistic traits.

1.4 Research Purpose

This study aimed to measure the effects of incorporating improvisational music therapy techniques into traditional Chinese bamboo flute courses on music university

students' autistic traits, emotion regulation, and perceived stress through a mixed-methods study.

1.5 Research Objectives

1. To investigate the autistic traits of music major students before taking the improvisational Chinese bamboo flute course.

2. To analyze the changes in autistic traits of music major students after completing the improvisational Chinese bamboo flute course.

3. To investigate the emotion regulation of music major students before taking the improvisational Chinese bamboo flute course.

4. To analyze changes in music major students emotion regulation after completing the improvisational Chinese bamboo flute course.

5. To investigate the perceived stress levels of music major students before taking the improvisational Chinese bamboo flute course.

6. To analyze the changes in perceived stress among music major students after completing the improvisational Chinese bamboo flute course.

7. To explore the effects of bamboo flute course on the autistic traits, emotion regulation and perceived stress of music major students using the five dimensions of PERMA theory.

1.6 Research Questions

1. What are the autistic traits of music major students before taking the improvisational Chinese bamboo flute course?

2. Any significant changes in autistic traits of music major students after completing the improvisational Chinese bamboo flute course?

3. What are the emotion regulation levels of music major students before taking the improvisational Chinese bamboo flute course?

4. Any significant changes in music major students emotion regulation after completing the improvisational Chinese bamboo flute course?

5. What are the perceived stress levels of music major students before taking the improvisational Chinese bamboo flute course?

6. Any signifcant changes in perceived stress among music major students after completing the improvisational Chinese bamboo flute course?

7. How does the Chinese bamboo flute course affect the autistic traits, emotion regulation, and perceived stress of music major students using the five dimensions of the PERMA theory?

1.7 Hypotheses

H_o1: There is no significant difference in the autistic traits of music major students before and after completing the improvisational Chinese bamboo flute course.

H_o2: There is no significant difference in the emotion regulation levels of music major students before and after completing the improvisational Chinese bamboo flute course.

H_03: There is no significant difference in the perceived stress levels of music major students before and after completing the improvisational Chinese bamboo flute course.

1.8 Significance of Study

This comprehensive study delves into the impact of an improvisational Chinese bamboo flute course on university students, particularly those majoring in music, and its influence on critical psychological aspects such as emotion regulation, perceived stress, and autistic traits. This study is both relevant and vital in light of increasing worries about university students' mental health. Research by Zhou et al. (2018) shows a higher propensity for psychiatric issues such as depression and anxiety in individuals with more pronounced autistic traits. Additionally, data from the "2022 National Depression Blue Book" indicates that the prevalence of depression has increased from 16% to 30%. This research provides valuable insights into alternative, creative methods for enhancing emotional and psychological well-being. Its exploration of the relationship between music education and these psychological variables contributes to a broader understanding of the benefits of music education. this research provides crucial perspectives on novel, creative methods to improve emotional and psychological health. Its exploration of the relationship between music education and these psychological variables contributes to a broader understanding of the benefits of music education.

The study stands out for its focus on the cultural richness of the Chinese bamboo flute, an instrument with deep roots in Chinese tradition. This approach extends the boundaries of conventional music education research by investigating the therapeutic potentials of traditional musical instruments. The unique flavor of traditional Chinese

folk music, based on the pentatonic scale, reflects Chinese culture's distinct emotions and values and has been noted for its role in emotion regulation and music therapy. The Chinese bamboo flute, as a significant element of Chinese folk music culture, embodies the spirit and culture of the Chinese people. This aspect of the study provides a unique perspective on how cultural heritage can be integrated into arts education to promote emotional health and broadens the scope of music education research by linking cultural practices to mental health benefits.

This study, conducted to address a void in current research, includes participants with a spectrum of autistic traits. In doing so, it provides an inclusive perspective on the benefits of music education for a diverse student body. This is particularly crucial in higher education settings, where inclusivity and support for students with different needs are essential. By exploring the potential of music education as a supportive tool for students across the autism spectrum, this research could be instrumental in guiding educators and curriculum designers. Furthermore, the Chinese bamboo flute course as a non-pharmacological intervention could significantly improve the levels of highly autistic traits among university students, aligning with modern educational trends and addressing practical solutions to students' psychological and behavioral issues.

Finally, the practical implications of this study are extensive. By demonstrating the positive impacts of the Chinese bamboo flute course on emotion regulation and stress reduction, the research could pave the way for the integration of similar programs into university curricula, underscoring the importance of arts education in student development and well-being. This study advocates for a holistic educational approach that balances cognitive learning with emotional and psychological care. Moreover, it could provide valuable strategies and tools for the Ministry of Education,

national and regional education departments, and educators to apply such courses for university students, including those with high autistic traits. This approach has the potential to enhance students' mental health education and contribute indirectly to the development of Chinese folk instrumental music, the flourishing of Chinese folk art, and the enrichment of Chinese culture in professional and functional ways.

1.9 Operational Definitions

1.9.1 Chinese Bamboo Flute

The Chinese bamboo flute is a musical instrument made of bamboo. It is an ancient Chinese musical instrument and the most representative and ethnic of Chinese instruments. Flutes are generally divided into southern and northern flutes. In this study, the Chinese bamboo flute is a long-bodied flute with a thick, soft, fresh, and mellow tone in the key of D.

1.9.2 Emotion Regulation

Emotion regulation is the process by which each person manages and changes his or her own emotions or those of others (Hoffmann et al., 2020). In this study, emotion regulation refers to the processes used to change emotions in terms of physiological activities, participative experiences, and expressive behaviors. Successful emotion regulation is primarily about managing emotional experiences and behaviors at moderate levels, which includes weakening or removing ongoing negative emotions, activating needed emotions, and masking or camouflaging a negative emotion. As can be seen, emotion regulation includes processes such as inhibition, weakening, and masking, as well as processes of maintenance and enhancement. In this study, emotion regulation was measured using the Emotion Regulation Questionnaire (Gross & John,

2003). Two emotion regulation strategies are covered in this questionnaire: cognitive reappraisal and expressive suppression. Cognitive reappraisal changes one's emotional response by altering the meaning attributed to the situation or stimulus. At the same time, expressive suppression refers to the effort to inhibit the outward display of emotions, even though the emotional response has already been generated internally (Cutuli, 2014).

1.9.3 Perceived Stress

Perceived stress is a critical psychological factor, particularly among university students who face unique challenges and pressures associated with academic life. Unlike objective stressors, perceived stress reflects an individual's subjective interpretation of stress, which can significantly impact their mental health, coping mechanisms, and overall well-being (Cohen et al., 1983). This distinction is essential because two individuals facing identical stressors may experience and respond to them differently based on their perceived stress levels.

In the context of university students, perceived stress can be influenced by various factors such as academic workload, performance expectations, social relationships, and future career uncertainties. Music major students, for example, often experience added stress due to performance pressures, frequent assessments, and the need for continuous practice to maintain technical skills. Studies have shown that high levels of perceived stress among students can lead to adverse outcomes such as anxiety, depression, and burnout, ultimately affecting academic performance and personal growth (Misra & McKean, 2000).

This study employs the Perceived Stress Scale (PSS) to assess the two primary dimensions of perceived stress: perceived helplessness and self-efficacy. The

dimension of perceived helplessness, which encompasses feelings of losing control and being overwhelmed, is particularly relevant to students who may struggle with adapting to academic demands and managing multiple responsibilities. On the other hand, self-efficacy, the confidence in one’s ability to handle stressors, plays a crucial role in buffering against stress-related negative effects. A higher sense of self-efficacy has been associated with better mental resilience, allowing students to effectively manage challenges without becoming overwhelmed (Bandura, 1997).

Understanding perceived stress in this context is vital, as it can inform targeted interventions aimed at reducing stress levels and promoting mental health. For instance, resilience-building programs, stress management workshops, and counseling services could be tailored to help students reframe their perception of stress and enhance their self-efficacy. By exploring perceived stress in relation to music major students, this study aims to shed light on how specific academic environments influence stress perception and coping, ultimately contributing to more supportive educational structures.

1.9.4 Music Major University Students

In this study, music undergraduates specifically refer to students majoring in music and dance at a university in Hunan Province. These students engage in full-time undergraduate study. Music primary university students represent a distinct segment within higher education, primarily focused on the comprehensive study and practice of music. These students engage in a rigorous curriculum including performance, music theory, history, and composition, demanding high artistic and technical proficiency. Their education involves intensive training, encompassing individual practice and ensemble participation, to hone their skills and deepen their understanding

of musical traditions. Alongside academic pursuits, these students frequently participate in performances, recitals, and competitions, experiences that contribute significantly to their professional development and personal growth. In this study, music major university students refer to first-year undergraduates majoring in music and dance in Hunan Province. These students, primarily skilled in piano or vocal music, possess foundational music expertise and are embarking on their formal university music education. While they have a background in specific musical disciplines, the Chinese bamboo flute represents a new area of study for all of them. The first encounter with the Chinese bamboo flute course presents a distinctive chance to investigate how learning a novel musical instrument impacts students' emotion regulation, stress management, and cognitive growth.

1.9.5 Autistic Traits

In the academic context, understanding autistic traits is essential for fostering inclusive learning environments, particularly as these traits are not confined to individuals with a formal Autism Spectrum Disorder (ASD) diagnosis. Autistic traits represent a spectrum of behavioral and cognitive features that, while associated with the broader autism phenotype, can be present in varying degrees within the general population. Among university students, such traits may manifest as social interaction challenges, communication difficulties, a preference for routine, and intense, focused interests. Recognizing these traits in students without a clinical ASD diagnosis allows educators and administrators to better address diverse learning needs (Baron-Cohen et al., 2001).

Research has shown that students with high levels of autistic traits may face unique social and emotional challenges within the university setting. For example,

social interaction difficulties may hinder their ability to form and maintain friendships, while a strong preference for routine can lead to increased anxiety when faced with academic or environmental changes (White et al., 2011). Additionally, individuals with high autistic traits may demonstrate heightened attention to detail, which can be advantageous in certain academic disciplines but may also lead to challenges in adapting to dynamic or ambiguous learning environments (Jobe & White, 2007).

This study utilizes the Autism Spectrum Quotient-28 (AQ-28) to assess these traits across five distinct dimensions: Social Skills, Routine, Attention Switching, Imagination, and Pattern Recognition. Each of these dimensions provides insight into specific areas that may impact students' academic and social experiences. For instance, difficulties in Social Skills could affect peer interactions and collaborative work, while limited Attention Switching capabilities might impact students' ability to manage multiple academic tasks. The Routine dimension is particularly relevant in a structured university environment, as disruptions to established patterns can be a source of stress for students with high autistic traits.

Understanding and acknowledging these traits within the student population highlights the critical need for neurodiversity awareness and accommodation in higher education. By identifying the specific needs associated with each dimension of autistic traits, educational institutions can implement tailored support systems, such as structured schedules, individualized learning approaches, and enhanced social support, that promote both academic success and emotional well-being (Mazefsky et al., 2013). This approach not only benefits students with high autistic traits but also enriches the broader academic environment by celebrating diverse cognitive profiles and fostering a culture of inclusivity.