

# Song Emotion Intelligence Analysis for Psychological Stress Relief

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## ABSTRACT

In today's digital and networked era, multimedia content such as images, audio, and video have become an important part of the data transmitted on the Internet's information superhighway. How to manage the stress in the college student population is directly related to the future life and development of college students. In this article, based on domestic and international data mining technology, the authors designed an intelligent analysis system for college students' mental health, pre-processed the data, then analysed these data in detail by using the outlier analysis algorithm in clustering algorithm, and finally mined the intrinsic connection between the psychological problems and attributes by using the Apriori association rule algorithm, so as to provide the decision makers with a reliable basis. This study puts forward reasonable solutions and suggestions for the problems existing in the psychological level of contemporary college students.

## KEYWORDS

DM, Intelligence Analysis, Multimedia Big Data, Psychological Stress, Song Therapy, Songal Emotion

## INTRODUCTION

As the backbone of the country's and society's future development, college students will face severe consequences if psychological factors affect their development (Vandebroek et al., 2018). In terms of their interpersonal environment, entering high school from junior high school, students face new teachers and classmates and a new learning environment and school management atmosphere; boarding students also face new living environments and conditions, as well as new psychological weaning (Yan et al., 2022). University teachers and students increasingly recognize song therapy. This study uses group song therapy, drawing on relevant theories of group psychological counseling, to systematically intervene in the psychological stress of college students and explore the application effect of group song therapy on stress reduction in college students. However, existing song fragment melody retrieval methods continue to be based on the physical characteristics of the song, and the retrieval process cannot continue when users do not remember the song melody (Wang, 2014). In the advanced semantic features of songs, emotional semantics are higher-level features beyond melodic semantics. Therefore, users' emotional needs must be considered thoroughly in song retrieval. At the

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same time, the users of emotional songs are not experts but ordinary users, which results in songs—searched based on input emotional characteristics—not being what users need (Li & Yu, 2021).

On this basis, songs must be labeled with the emotions of ordinary users to make comprehensive recommendations in combination with expert categories. On professional forums, the classification of songs is accurate and detailed, providing users with a friendly interactive platform, and the emotional tendencies reflected by a large number of user comments determine the public emotions of a song. Therefore, this article proposes a song sentiment semantic analysis, processing, and retrieval scheme based on song comment content. The article uses a clustering algorithm-based outlier analysis algorithm to analyze these data in detail, attempting to determine the mental health status of each college student. Then, we use the Apriori association rule algorithm to explore the intrinsic connections between psychological problems and various attributes, thereby providing a reliable basis for decision-makers. The song's emotions are taken from the user and fed back to the user, thus achieving the effect that the song's emotions are closely related to the user and change with the user. Through this study, we hope to provide more effective psychological intervention methods for college students to promote healthy growth and development.

This paper mainly offers the following innovations:

1. If mental illness is regarded as “abnormal,” it can be regarded as a “rare category” or “outlier” due to the small number of such categories, which can be classified as the problem of mining unbalanced data sets. For this kind of problem, it is difficult to achieve ideal results when using traditional clustering and classification techniques (categories must be known in advance).
2. Most research on college students' psychological problems collects data through mental health testing tools (such as the SCL-90 symptom self-rating scale or the Chinese College Students' Mental Health Assessment System). Then, it conducts analysis and statistics on these data. The content of the psychological test questionnaire is effective for the judgment and prediction of mental health. The conclusion is scientific and accurate, but this method is still lacking in determining the cause analysis of mental health problems. It does not consider the influence of many factors on mental health, such as the fluctuation of students' academic performance, family status, and students' love. Therefore, it is more reasonable and effective to comprehensively use various data and apply correlation analysis techniques to mine and analyze the data.

## **LITERATURE REVIEW**

In ancient China, good Chinese medicine did not treat diseases with acupuncture but with song. The combination of Chinese traditional songs and medical treatment has a long history in China, having experienced the process of origin, development, maturity, and even gradual extension. Multimedia content, such as audio, images, and videos, currently accounts for 15% of the World Wide Web, a number that is growing rapidly (Karageorghis et al., 2021). The traditional way to search for a song is to query a music database by matching the song name, singer name, or lyric content to return relevant results. In essence, such databases use a text search based on keywords. Users must remember relevant information to search, such as in Google's song search function or Baidu mp3 search (Sinclair & Tinson, 2017). As a unique language, music can express the sounds of nature and convey people's emotions. Especially when people are experiencing pain, sadness, and loss, music also alleviates, relieves, and eliminates these pains. In China's historical records, written records of applying song in medicine and psychotherapy have existed for a long time (Croom, 2015). With China becoming increasingly internationalized, people's lives are becoming richer. The satisfaction of their material needs has broadened people's horizons, and they have begun to pursue their own spiritual needs. Many of them have begun to pay more attention to song, dance, painting, and other art forms, hoping to enrich themselves through artistic edification, to make up for a feeling of emptiness and a low level of spirituality, and to improve their quality and shape a noble personality (Sinclair & Tinson, 2017).

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