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Research Article

Construction and Evaluation of College Students' Psychological Quality Evaluation Model Based on Analytic Hierarchy Process

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College students are a special group of society, having received university education and being at the forefront of new ideas and technologies in society. The basic psychological characteristics common to modern college students and the unique role psychological characteristics of ordinary students are the two major group factors. The basic psychological factors include cognition, personality, and social adaptive behavior. Hierarchical analysis (AHP) is a scientific method for assessing and identifying problems, correlating quantitative treatment of problems with qualitative analysis, and is well suited for semistructured or unstructured decision-making problems. This paper preliminarily studies the structure of College Students' psychological quality under the background of localization and the construction method of College Students' psychological quality evaluation model based on analytic hierarchy process. It is proposed to introduce the hierarchical analysis method into the behavioral assessment model of college students' psychological disorders as the entry point. A model was built to help college ideological and political educators determine whether college students have psychological disorders and disorders provide important insights. The results showed that the split-half reliability of this constructed method was 0.782, and the retest reliability was 0. The standard deviation of the coefficients among all the test subjects was 0.842, indicating that there is a positive correlation between the coefficients. The standard deviation of the coefficients between all test subjects was 0.842, indicating good confidence. Therefore, the model can objectively assess the psychological state of college students and realize the quantitative safety psychological assessment of college students, which is useful for reference in the implementation of teaching decisions.

1. Introduction

College students are the hope of social development, and their healthy growth is directly related to the future political, economic, and technological development of the country [1]. The research on the evaluation of school mental health education curriculum will directly affect how to establish the curriculum objectives of school mental health education [2], as well as a series of theoretical research and practical issues such as how to write school mental health curriculum materials, how to implement school mental health curriculum, and how to implement school mental health curriculum [3]. Their social environment and physiological age determine that the four years of college are a critical period in their life development. During this special period, college students often face many common psychological problems, such as emotional instability and self-awareness bias [4]. With the increasing prominence of the problem of psychological disorders among college students, it has many negative effects on students themselves, their families, schools, and society [5]. If it is not effectively addressed in time, it will affect the fairness of education, the healthy growth of college students, and the stability of universities and society [6].

The AHP algorithm is a hierarchical, structured, qualitative, and quantitative decision-making method [7]. It enables the combination of qualitative and quantitative, expresses people's subjective judgments in quantitative form, and uses hierarchical structure and judgment matrix as a processing tool to systematically provide decision makers with decision results [8]. A key step in hierarchical analysis

is the construction of a decision matrix and the calculation of ranking weights for each comparison element in the decision matrix [9]. However, one of the biggest drawbacks of psychometric tests is that subjects must be truthful about their thoughts [10]. In fact, many students are reluctant to reveal their inner world to others, leading to inaccurate results [11]. Therefore, the study of the theory and methods of decision analysis is not only of theoretical importance for the development of management science, but also of practical importance for solving many complex decision problems. In particular, a quantifiable and practical measurement tool that can be used to measure psychological quality is important [12]. Cultivating college students into builders and successors of the socialist cause with Chinese characteristics requires the widest sharing and fastest development of college students' psychological quality assessment and deeper information mining in all aspects [13]. College students will inevitably face various psychological conflicts and contradictions. Without timely and effective guidance and intervention, they can lead to serious psychological disorders and tend to passivity and laziness [14]. Some students can be screened by psychological tests, but others cannot be judged. The optimal treatment period is delayed because psychologists must wait until they detect abnormal behavior before they can be sent to a psychotherapy center [15]. Therefore, it is necessary to analyze the collected information through a scientific system of early warning indicators and risk assessment models to understand the psychological state of students in time to prevent problems before they occur.

The innovation points of this paper are as follows:

(1) It has studied the comprehensive quality assessment of college students, analyzed the current situation of comprehensive quality assessment of college students, and made a useful reference for constructing a new assessment system

(2) The psychological assessment of college students is taken as a separate task, so that the school can understand the psychological problems of college students more intuitively and have an objective point of view in the continuous use and improvement. Students' comprehensive situational awareness in all aspects can be observed

(3) Using the hierarchical analysis method, the corresponding index weights are set and a more detailed evaluation index system is constructed, taking into account the needs of college students at different levels of society

The research framework of this paper contains five major parts, which are arranged as follows:

The first part of this paper introduces the background and significance of the research and then introduces the main work of this paper. The second part introduces the work related to the construction of the psychological quality assessment model for college students and the application of AHP to psychological quality assessment. The third part of the paper introduces the method of constructing the hierarchical model and the overall design method of the psychological quality assessment model, so that the readers of this paper can have a more comprehensive understanding of the construction method of the AHP-based psychological quality assessment model for college students. The fourth part is the core of the thesis, from the theoretical analysis of AHP applied to psychological quality assessment and the group decision AHP analysis, to complete the description of AHP and its improvement analysis of psychological quality assessment. The last part of the thesis is a summary of the full work.

2. Related Work

2.1. Construction of Evaluation Model of College Students' Psychological Quality. The evaluation of school mental health education programs plays a very important role in the implementation and operation of school mental health education programs, but there are various misunderstandings and difficulties in the theoretical research and practical operation process. At this stage, there are more research results on school mental health, but they are mostly focused on educational curriculum, psychological counseling, and psychological crisis intervention programs. Few mental health education activities are available. So this paper addresses this situation and conducts a more comprehensive and in-depth theoretical research and practical discussion on the construction of the student psychological quality assessment model.

Yin defines psychological quality as "a complex whole that includes cognitive ability, needs, interests, motivation, emotions, will, personality and other non-intellectual factors in an organic way, with the development of human self-awareness as the core and the positive and social development as the unified value-oriented" [16]. Wang and Park believe that in the evaluation of mental health education curriculum, the goal oriented evaluation is not desirable, and the process oriented evaluation should be adopted [17]. Wang et al. theoretically analyzed psychological quality assessment and suggested that students' psychological qualities include positive attitudes toward life, positive self-concept, dedication and responsibility, caring and cooperation, intelligence and creativity, practice and survival, frustration tolerance, and perseverance [18]. Zala et al. developed a manual of behavioral medicine scales, such as the Anxiety Self-Assessment Scale and the Depression Self-Assessment Scale, and used the result scores of the scale questionnaire method as a basis for judgment to evaluate the psychological quality of the subjects [19]. Zala et al. suggested that psychological quality assessment could be a breakthrough in the localization movement of Chinese psychology, and that the study of psychological quality of college students could be a unique growth point in the localization of Chinese psychology [19]. The study of psychological quality of college students can be a unique growth point in the process of localization of Chinese psychology [20].

Therefore, it is important to devote to counseling students with psychological disorders or illnesses to improve their psychological tolerance, social adaptability, and

frustration tolerance, so that they can continuously adjust themselves to society, but at the same time, there is no attention to their creative ability, which to some extent curbs their thinking and ability to transform society.

2.2. Application of AHP in Psychological Quality Evaluation. University students are a special social group; compared with the general group, they are more youthful and energetic, with clearer life goals and higher ideal ambitions. Through the exploration and research of mental health standards, we found that many scholars in China previously used a variety of evaluation standards when conducting mental health research due to the lack of unified mental health standards for college students. Moreover, most of them refer to the mental health standards of ordinary people in the process of research, which leads to great variability of research results. Therefore, we should use AHP to construct the framework of the evaluation index system of college students' mental health education, assign weights to indicators at all levels, and derive the basic model of the evaluation index system of college students' mental health education, in an attempt to provide a realistic reference for colleges and universities to carry out the work of college students' mental health education.

Ding and Yu proposed that the evaluation system of psychological education courses includes the measurement and evaluation of psychological functions, analysis of activity results, product analysis, and analysis of introspective materials [21]. Roncaglia made a rigorous mathematical derivation of the method of finding the weighted comprehensive ranking vector under group leapfrog [22]. Power et al. proposed a statistical test method to test the consistency of judgment matrix. The key is to design "Statistics" and make assumptions about the distribution of "Statistics" [23]. Viktorenko introduced the method of using data envelopment analysis to obtain the weight ranking of judgment matrix in AHP, discussed its feasibility, and verified the wide applicability of the model through an example [24]. Pu solved the weights by geometric mean method and proposed a new consistency test method with a critical value indicator, but the method is only suitable for specific weight solving methods and has poor applicability [25].

Applying AHP, the relevant factors and their interrelationships were screened, the relative importance between the decision schemes was determined by two-by-two comparison, the judgment matrix was constructed, the importance ranking weight coefficients among the factors were solved hierarchically, and the stochastic consistency index of the judgment matrix was calculated, by which the evaluation model of psychological disorder-induced behavior of college students was constructed.

3. Construction Method of Evaluation Model of College Students' Psychological Quality Based on AHP

3.1. Method for Construct Hierarchical Model. The hierarchical model of psychological measurement refers to the use of scientific psychological test scales to collect information on the evaluation of school mental health education programs, to measure students' mental health, and to diagnose whether the level of students' psychological development has improved and increased and what problems still exist [26]. The core aspect of constructing a two-by-two comparative judgment matrix type AHP and a good judgment matrix directly affects the objectivity of the ranking [27]. Due to the different types of information carried by the set indicators, each indicator subsystem and specific indicator items play different degrees in the process of describing a social phenomenon or social condition. Therefore, the comprehensive index value is not equal to the simple sum of the subindicators, but a weighted summation relationship is as follows:

$$S = \sum_{i=1}^{n} w_i f_i(I_i), i = 1, 2, \cdots, n. \quad (1)$$

$f_i(I_i)$ denotes some measure of I_i. w_i is the weight value of each index.

Therefore, in the process of practical application of AHP, it is necessary to conduct a special study on the construction of psychometric hierarchical model in the construction of judgment matrix. The principle of application of object-oriented technology is to simulate human habits of thought as much as possible, to get as close as possible to the methods and processes of human understanding and problem solving. The systematic procedure of the hierarchical model is shown in Figure 1.

First, when applying AHP to solve problems, it is important to analyze the relationship between the various factors involved, to understand and analyze the problem under study and the specific environment in which it is located. It is mainly used to complete the self-assessment of the psychological quality of the students according to their actual situation through various self-assessment scales in the system, as well as the possibility of dialogue with the teacher in the form of messages [28]. There is a certain association between factors in the step hierarchy model. Multiple levels are formed by factors according to a certain relationship, the next level of factors is a refinement of the previous level of factors, and the previous level of factors serves as a guideline to govern the next level of related factors. When AHP decision-making evaluates a complex system or problem, what one needs to determine is the goal, the factors affecting the goal, the alternatives, etc. Among them, determining the individual factors affecting the goal is the key to decision evaluation. The absolute value is compared with the specified threshold, and the part less than or equal to the threshold is 0. The part greater than the threshold is the difference with the specified threshold, which is the soft threshold denoising. The calculation formula is as the following equation:

$$\omega\lambda = \begin{cases} [\text{sign } (\omega)](|\omega| - \lambda), |\lambda| \geq \lambda, \\ 0, |\omega| < \lambda. \end{cases} \quad (2)$$

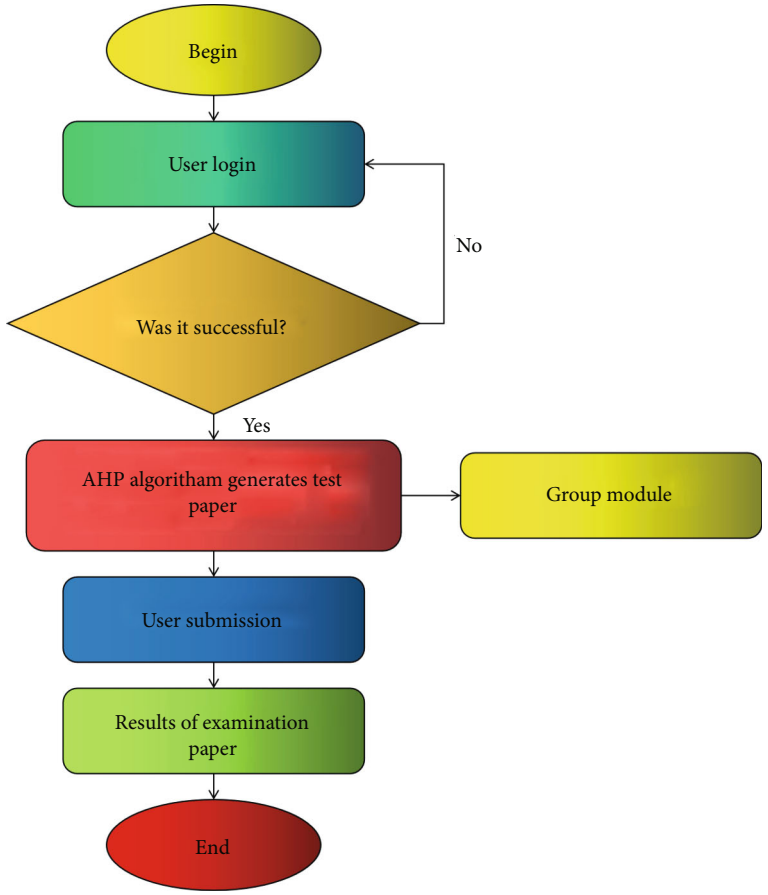

Figure 1: Block diagram of hierarchical model program.

Independent variable analysis can finally obtain independent components by analyzing the high-order characteristics of signals. Suppose a mixed signal $X(k)$ is composed of m dimensional observation signal vector:

$$x(k) = [x_1(k), x_2(k), \cdots, x_m(k)]^T. \quad (3)$$

Solving the relative weight of each level index subsystem or index item according to the judgment matrix is mathematically the problem of calculating the maximum eigenvalue of the judgment matrix and its corresponding eigenvector. Take the judgment matrix H as an example, that is,

$$HW = \lambda W, \quad (4)$$

where H is the judgment matrix and W is the feature vector.

Second, the problem is split and summarized to make the analysis process organized and hierarchical. The criterion layer contains each criterion that affects the goal of decision evaluation, and there are generally two relationships between the criteria: independence, in which the same layer is independent of each other and does not affect each other, and dominance, in which the factors in the upper layer dominate the relevant factors in the lower layer [29]. The credibility of the judgment matrix given by the experts using hierarchical analysis varies due to their different knowledge levels, structures, and degree of understanding of things. Assuming that there are k experts, the expert weights are obtained using the following equation:

$$p_i = \frac{1}{1 + \partial CR_i} (i = 1, 2, L, k). \quad (5)$$

In addition to the basic student management system functions, a student psychological early warning function has been added, with the help of a scientific early warning indicator system and a risk assessment model, through data analysis of the collected information. It provides timely feedback on students' study, thought, and psychological status in each semester during their school years, and improves reliable data for student work to prevent problems before they occur. Therefore, the database of this system is constructed as shown in Figure 2 below.

There are many interrelated and interacting factors within a complex system or problem [30]. These factors are intricate and not completely independent of each other, but with some simplification, the influencing factors of the model objectives can form a hierarchical structure that simplifies the decision-making in the analysis of a complex system or problem.

Finally, a hierarchical model is constructed through close collaboration between operation researchers, decision

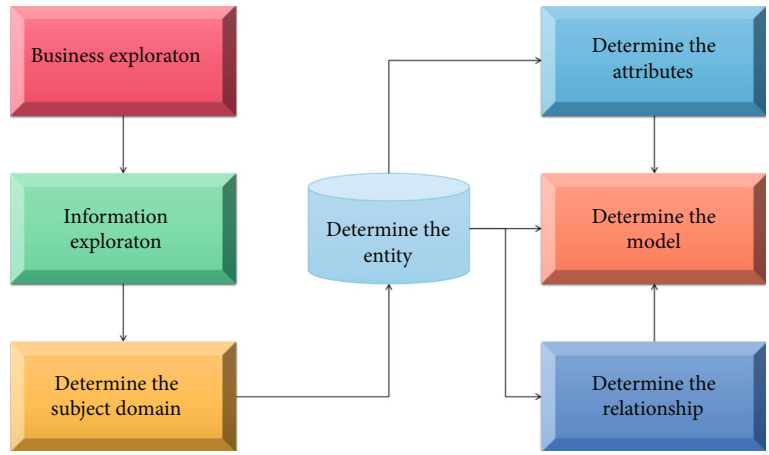

Figure 2: The flow chart of database construction of the system.

makers in talent assessment, and human resource practitioners. Among them, cognitive and personality factors are implicit in nature and are eventually expressed through the outward expressions of people's words, expressions, and behaviors in various activities and are observed, recognized, and understood. Through the statistical and generalization of these index elements, the structure, hierarchy, function, and contact of the evaluation system are examined comprehensively, and theories from management, psychology, and talent science are used to verify and justify, and necessary modifications and additions are made.

3.2. Overall Design Method of Psychological Evaluation Model. AHP is suitable for decision problems with more complex structures and multiple decision criteria that are not easily quantifiable. However, AHP also suffers from the objective fact that it cannot overcome the cross-correlations that usually exist between decision layers and between evaluation indicators. Decision makers are usually unable to quantify the specific weighting between some special factors, and the criterion level usually has a multilayer structure with a large number of influencing factors, so that decision makers cannot comprehensively and objectively determine the degree of influence of subfactors relative to the upper-level factors. Therefore, only a scientific and reasonable construction of a set of psychological quality assessment model can accurately reflect the requirements of the party and the state on the quality of college students and can play the role of correct guidance, inspection, control, and motivation.

First of all, various relevant information of students is fed back to the thinking counselor or class teacher who is responsible for managing that student in time, and at the same time, various information records are analyzed, and reports and graphs are issued. However, in the AHP assessment process, the decision maker also needs to determine the weight value of the guideline level-associated factors relative to the target level factors. Finally, the assembled results are transformed into 1~9 scales according to the inverse transformation.

$$\begin{cases} F(x) = \dfrac{1}{x+1}, x \in \{0, 1, 2 \ldots 7, 8\}, \\ F(x) = -x + 1, x \in \{-2, -3, -4, \cdots, -7, -8\}. \end{cases} \tag{6}$$

Constructing the judgment matrix is a key step in applying AHP. The information basis of AHP is mainly the judgments given by people about the mutual importance of each element at each level, and these judgments are expressed numerically and written in the form of a matrix, i.e., judgment matrix. If the mean values of two matrices are equal, it is necessary to compare their variances:

$$\sigma_s^2 = \sum_{l=1}^{k} \frac{(P_{sl} - P_s)}{(k-1)}, \sigma_t^2 = \sum_{l=1}^{k} \frac{(P_{tl} - P_t)}{(k-1)}. \tag{7}$$

After completing the calculation of the weight vector of an element of a layer under the criterion relative to an element of the previous layer, the last is for the synthetic weight of each element relative to the total target layer, and let the ranking weight vector of the $k-1$ elements of the $K-1$th layer relative to the target layer be the following:

$$\omega^{(k-1)} = \left(\omega_1^{(k-1)}, \omega_2^{(k-1)}, \cdots, \omega_{k-1}^{(k-1)}\right). \tag{8}$$

The basic idea of the matrix method is to use a certain scale to represent the results of comparing two factors with each other, so as to construct a two-comparison judgment matrix. The decision problem is analyzed in detail, and all the influencing factors are derived, and then, they are grouped into different levels according to the different attributes of each influencing factor, forming an orderly progressive evaluation model layer by layer. The basic process is shown in Figure 3.

Secondly, the system uses B/S approach to implement some relevant functions and applications of psychometric analysis and early warning system. Mathematical

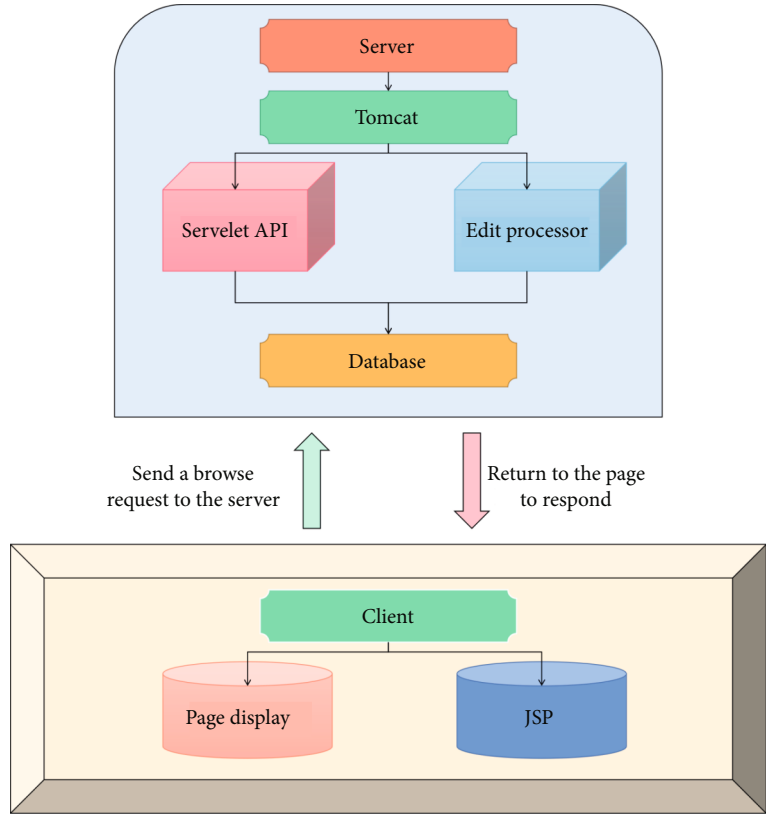

Figure 3: System structure realization flow chart.

transformation is generally used to transform the judgment matrix into a consistency matrix, but no consideration is given to maintaining the original judgment information of the decision maker in the improved model, which is crucial for the adjustment of the judgment matrix. Geometric averaging is performed on each row vector of the judgment matrix, and then, normalization is performed. Firstly, the product operation is performed on the elements of each row of the judgment, i.e.,

$$M_i = \left(\prod_{j=1}^{n} a_{ij} \right) \frac{1}{n}, \tag{9}$$

in which $i = 1, 2, \cdots, n$. And then, normalizing

$$\omega_1 = \frac{M_l}{\sum_{l=i}^{n} M_l}, i = 1, 2, \cdots, n. \tag{10}$$

The modeling principle of diversified data collection is adopted, through multiple levels such as theoretical orientation, professional orientation, and personal orientation, while the Student Contingent Psychological Qualities Questionnaire is administered to different groups such as educational scholars, college teachers, student workers, personnel managers, and senior college students. The elements in the upper level have a dominant effect on all or some elements in the adjacent lower level, i.e., all or some elements in the lower level are a subdivision of an element in the upper level, so that an ordered recursive assessment model can be constructed. Its output can be tabulated:

$$y = f\left(\sum_{j=1}^{n} w_j u_j - \theta \right) = f\left(\sum_{j=0}^{n} w_j u_j \right), \tag{11}$$

where u_j is the j input of sensor.

Finally, the relational database system was used to establish a database to store basic information, such as departments, counselors, class teachers, and students, as well as information of each assessment system and related assessments. The questionnaire was administered to different types of college students at the same time by using a self-assessment scale, and then, the structure of college students' actual psychological quality was constructed based on the collected information, and the actual differences between undergraduates and masters students were compared internally. It is a feed-forward network in which the input and output of each neuron are discrete values, and the output of each neuron is determined according to the threshold function after weighting and summing its input. Based on the developmental age of college students' psychological quality and the inspiration of "nearest developmental zone" theory, the actual psychological quality structure of college students is compared with the contingent psychological quality structure.

4. AHP of Psychological Evaluation and Its Improvement Analysis

4.1. Theoretical Analysis of Applying AHP to Psychological Quality Evaluation. AHP can quantify some qualitative problems that are difficult to quantify on the basis of strict mathematical operations and synthesize some quantitative and qualitative mixed problems into a unified whole for comprehensive analysis. The values of the elements in the judgment matrix reflect the decision maker's subjective perception and evaluation of the relative importance of each factor based on the objective reality. The basic idea of AHP is "decomposition before synthesis," which can be clearly seen from the steps of its use. AHP can be applied to this type of system or problem to better show its advantages, and it can also be used to analyze and evaluate more complex systems or problems. The eigenvectors and the maximum eigenroots of the judgment matrix are calculated using the eigenvalue method in order to calculate the maximum eigenroots for the total objective, taking the parameter values of 10 and 20, corresponding to the eigenvectors and eigenvalue pairs as shown in Figures 4 and 5 below.

Firstly, the factors involved in the problem are classified, and all factors are divided into target layer, criterion layer, and solution layer (also called measure layer in some literature) to find out the interrelationships and construct an ordered recursive hierarchy. The eigenvectors corresponding to the largest characteristic roots of the judgment matrix are solved first and then normalized to obtain the relative weights of the indicators in this layer corresponding to the indicators in the previous layer. A variety of extensions can also be applied, for example, data types, addition of new functions, aggregation functions, operators, procedural languages, and indexing methods. The judgment matrix constructed by the consistent matrix method is a comparison that represents the relative importance of all factors in this level against a factor in the previous level. Based on a factor of the previous level, it has a dominant relationship with the factors of the next level, and the relative importance of the factors of the next level is compared between two and two, and a certain score is assigned to it. So far, the decision maker can easily check whether the judgment matrix has order consistency and improves the judgment matrix that does not have order consistency. Among the three factors that can have an impact on the total target, bandwidth, time delay, and movement speed, bandwidth is the most important one among them, followed by the requirement for movement speed, and finally, time delay. The comparison of the weights of bandwidth, time delay, and movement speed under different scheme numbers is shown in Figure 6 below.

Secondly, the relative importance of each decision option under different criteria and total criteria is calculated by the decision maker's comparative judgment of the importance of each factor. Through expert analysis of the ratio of the influence of each two indicators on the target layer, the processing of data, and the recognition of each indicator, the judgment matrix is obtained, and then, the standardized (corresponding to the maximum eigenvalue) eigenvector of the matrix is calculated to find out the weight of each indicator on the target, and the consistency test is performed. The weight coefficients of each indicator must be scientifically and reasonably specified according to the actual situation, so as to ensure the correct evaluation results are obtained. When it is used for two-class model classification, it is equivalent to using a hyperplane in a high-dimensional sample space, separating the two classes of samples.

Finally, the superiority ranking of the decision alternatives is derived. The server side generates the tree by receiving and analyzing the various query requests transmitted by the client, then performs data retrieval on it, and formats the results for output, and finally returns the results to the client. The experts quantify the importance of each index in this level relative to a certain index in a higher level by comparing them two by two according to the 9-scaled method in AHP, determine their corresponding importance, rank them and obtain the relative weights, and establish a judgment matrix. If the input patterns are linearly separable sets, the algorithm must converge if there exists a hyperplane that can separate them. If the input patterns are linearly indistinguishable sets, the single-layer perceptron cannot perform the correct classification.

4.2. Group Decision AHP Analysis. Group decision AHP is a scientific evaluation method that integrates the group decision method with AHP. This is a key step in AHP. After establishing the recursive hierarchy, the juxtaposition and subordination of the elements are determined, and the decision maker can then make a judgment for the two-comparison relationship of the elements. The group decision AHP breaks through the limitations of traditional evaluation, so that students are no longer isolated from evaluation but are provided with an opportunity to learn, so that they can judge their own progress and whether their psychological quality has been improved and developed. There is a correlation between students' psychological quality and social work, i.e., whether students take up social work or not have a certain influence on psychological quality. The comparison of the degrees of freedom and the Levin's variance of the mean difference under different characteristic values is shown in Figure 7 below.

First, multiple experts are invited to evaluate an assessment task at the same time to minimize the role of individual subjectivity, reduce the bias in the assessment results, and make the assessment results more accurate. The method of obtaining relative weight vectors using least squares is highly adaptable, and the computational effort is effectively reduced. There are many ways to divide a scale into two halves (e.g., by the difficulty of the question, by the parity of the question number, and by the content of the question), so the same scale will have different half confidence values. In this study, 100 test questions were divided into two halves according to the content of the questions and the data are shown in Table 1.

Usually there is only one element, and below the target layer is the criterion layer, which is a collection of factors that affect the target. Usually there are multiple levels of criterion layers, which means that sublevels can be established

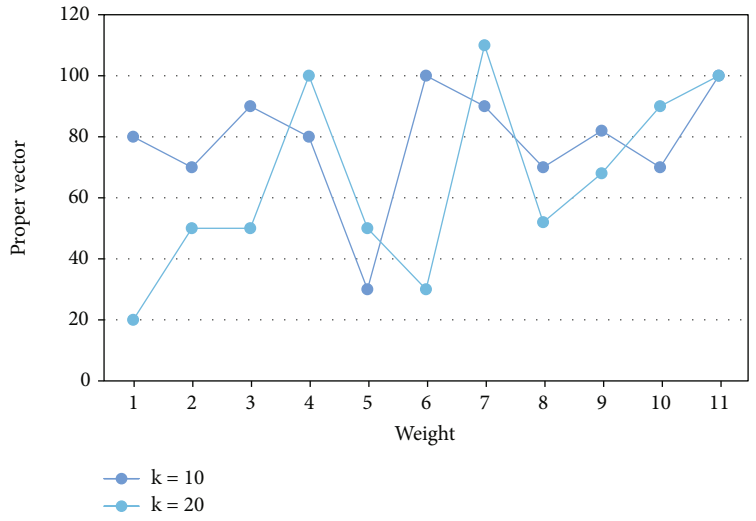

Figure 4: Comparison of feature vectors.

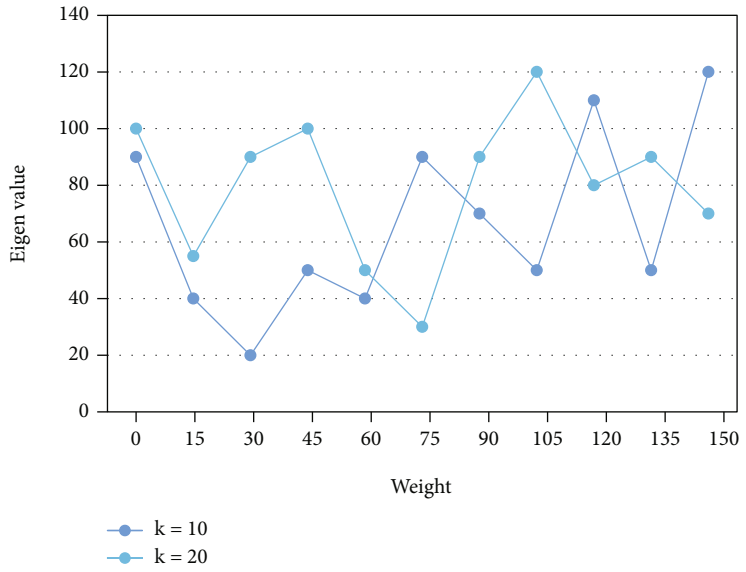

Figure 5: Comparison of eigenvalues.

between the criterion layers, and the sublevels are subordinated to one of the elements in the main level. Simulation data are generated through external simulation, then manual statistical calculations are performed, and the results of statistical analysis of the simulation data are compared and analyzed in the system. The consistency test is performed on the maximum eigenvalues of the judgment matrix, and if the consistency requirement is satisfied, then only the eigenvectors corresponding to the maximum eigenvalues need to be normalized, which are the final ranking weights. It is considered that there is a significant difference in the psychological quality of the investigated students who are working as social workers or not, which further indicates that whether students are working as social workers or not have a more significant effect on their psychological quality, and the Levin variance under different eigenvalues is shown specifically in Figure 8.

Second, the implementation of the group decision AHP requires a combination of the algorithm's own process and an auxiliary assessment and evaluation system. Because of the variety of split-half methods in split-half reliability and the less stable results obtained, it is relatively more accurate to use the α coefficient as an estimate of the internal consistency of the scale. The results are shown in Table 2 below.

The split-half reliability of this construction method is 0.782, the test-retest reliability is 0 813, and the standard deviation of α coefficient between all test objects is 0 842, which shows that this method has good reliability.

The smaller the calculation consistency index CI and CI, the greater the consistency, and vice versa. In the testing, we test the basic operations such as adding, modifying, and deleting in the system so as to ensure that the system can operate correctly. The use of 1-9 scales as the result of

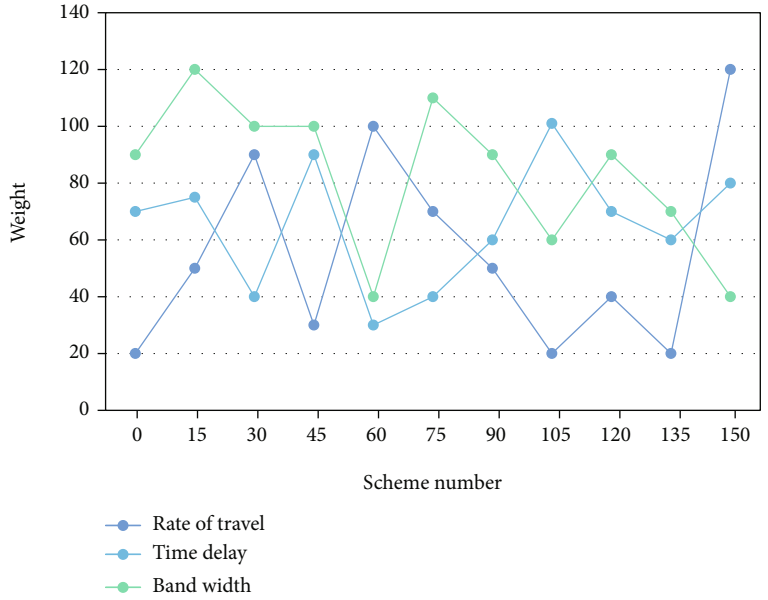

Figure 6: Comparison of weights of bandwidth, time delay, and moving speed.

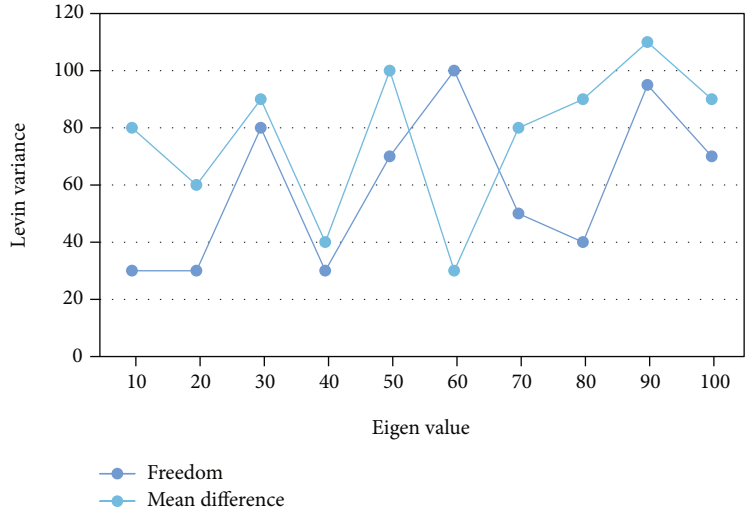

Figure 7: Comparison of Levin variance of freedom and mean difference under different eigenvalues.

Table 1: Split-half reliability with 100 topics.

	The first part	The second part
Split-half reliability value	0.562	0.498
Kehlenbach	0.44	0.38
Alpha coefficient	7.263	8.452

two-by-two factor comparison is also another reason for the deviation of the judgment matrix from consistency, and as the matrix order increases, the more difficult it is for the established judgment matrix to converge to complete consistency. Thus, when analyzing the order consistency test method of the judgment matrix, the judgment matrix of 1-9 scales is transformed into 0-1 matrix according to certain rules, thus simplifying the test method.

Finally, the data saved in the database needs to be assigned to the assessment model corresponding to the assessment task during the calculation of the method; otherwise, the calculation cannot be performed. The selection of the appropriate kernel function is the key factor, and it is necessary to apply the verified kernel function instead of the inner product according to the characteristics of the solution problem. The kernel function operation will transform the dot product operation of the high-dimensional feature space to the original space of low-dimensional features. After completing the assembly of the expert data, the upper half of the assembled matrix is converted into the full matrix, and the hierarchical single ranking and the hierarchical total ranking are performed by finding the maximum eigenvalue and the corresponding eigenvector for the full matrix to obtain the ranking results of the final solution.

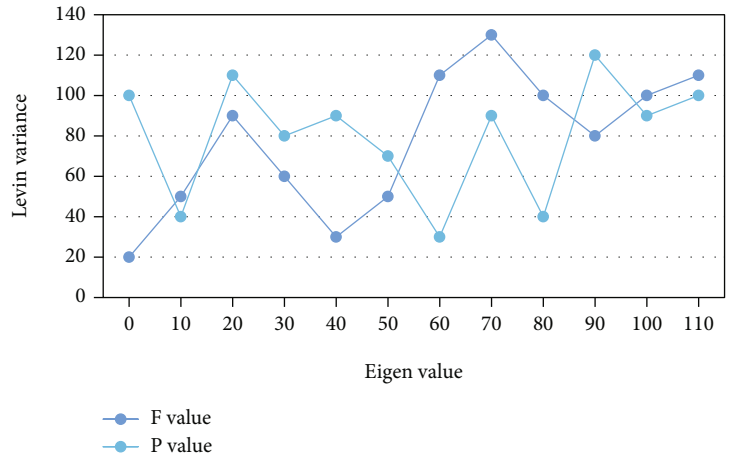

Figure 8: Levin variance under different eigenvalues.

Table 2: α coefficients of different categories.

Category	Alpha coefficient of 100 questions	20 factors and the alpha coefficient of the total score	Alpha coefficient between 20 factors
Alpha coefficient	0.562	0.773	0.679
Number of factors	20	28	12

5. Conclusions

Modern society belongs to the era of information, and the rapid development of information technology and its popular application in all walks of life and all fields have brought radical changes to human society. Higher education has changed from elite education to mass education, and the student source of colleges and universities has become diversified and multilevel, and the problem of psychological disorders among college students has become more and more prominent. The traditional structure of psychological quality is only limited to a static form and is studied in isolation outside its "bio-ecological" environment. AHP can be used not only quantitatively but also qualitatively, combining quantitative and qualitative approaches to decision-making processes. Also, AHP can be refined in its classification, specifically in the psychological evaluation of security of a certain category of staff with commonality, and adjust parts of the evaluation model for the commonality and characteristics of a special group. The article proposes the construction method of the AHP-based psychological quality assessment model for college students, using AHP to decompose the complex target system into multilayer indicators. And by applying the theory of AHP to psychological quality assessment, the group decision AHP is studied to find the index weights of each layer, which is used to judge the relative rationality of the index system. The AHP-based psychological quality assessment model of college students can help to evaluate students' safety psychological state quickly and efficiently and can find out the safety psychological "shortcomings" of each student, which can be used as a reference basis for relevant departments to formulate accident prevention measures and has a certain reference effect on students' safety.

Data Availability

The labeled dataset used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declares no competing interests.

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