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Research Article

Health Effects of Social Capital and Psychological Capital Based on Data Simulation Model

Yiqing He,[1] **Siping Guo**,[1] **and Ruitong Guo**[2]

[1]*School of Education, Guangzhou University, Guangzhou 510006, China*
[2]*Faculty of Education, Yunnan Minzu University, Kunming 650031, China*

Correspondence should be addressed to Ruitong Guo; 3562572895@qq.com

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In order to improve the intelligence of the analysis of the health effects of social capital and psychological capital, this paper combines the data simulation model for data processing and makes a detailed analysis of the cloud model-related theories from the aspects of concept, digital characteristics, normal cloud, cloud generator, and so on. Moreover, this paper uses the cloud model to make a fuzzy data classification method, including the identification of knowledge features, the construction of fuzzy cloud model, the calculation of data attribution to the constructed cloud model, and the classification of knowledge and data. In addition, this paper verifies the health effect model of social capital and psychological capital based on the data simulation model proposed in this paper through experiments. The research results show that the intelligent model proposed in this paper has a good effect in the intelligent analysis of the health effects of social capital and psychological capital.

1. Introduction

Social capital is the use of a network of relationships by an enterprise to obtain potential as well as actual resources. The good relationship network formed by the members of the organization will have a good effect on solving the coordination problems within the organization, which is conducive to the dissemination of organizational information among the members, thereby improving the performance of the enterprise. With the birth of positive organizational behavior theory, the research on psychological capital has gradually expanded to the scope of organizational management. Psychological capital is a positive, measurable, developable, and nurturing positive psychological situation that is conducive to the improvement of employee performance. Therefore, it is also valued by enterprise managers. Moreover, by exploring positive psychological capital, improving positive psychological ability, and actively mobilizing the enthusiasm of organizational members, organizational members can adjust their emotions in different organizational environments, choose appropriate emotional labor strategies, and create excellent performance.

With the deepening of research, scholars have formed different understandings of social capital from different perspectives. Scholars have the following views on the definition of social capital. One is the resource view, which is the most representative view. It believes that social capital is a collection of social resources and is widely permeated in various social relationship networks, and individuals can possess and obtain real or implicit resources through institutionalized relationship networks [1]. The second is the ability concept. It proposes that the ability of individuals to obtain relatively scarce resources in a certain way in the interaction with society is social capital. Moreover, the ability of individuals to obtain resources is not their own, but a kind of capital contained in the interaction with others [2]. The third is the functional view. It defines the connotation of social capital from a functional perspective and believes that social capital is a social resource that makes individual actions more convenient. The fourth is the view of cultural norms. It is

believed that social capital is essentially a cultural norm, and its manifestations include rules, institutions, and authority. The fifth is the network view. This view ignores trust, norms, and institutions and believes that social capital is a social network in form [3].

At present, most researches on social capital focus on organizational citizenship behavior, job performance, organizational innovation, interorganizational cooperation, resource exchange, and organizational commitment and many other management aspects. However, the research on individual emotional labor from the perspective of social capital is almost blank. Therefore, introducing the concept of social capital, which is still controversial but has been widely used, into the exploration of employees' emotional labor will expand and improve the results of social capital. At the same time, it also constructs a new theoretical perspective of emotional labor research, strengthens its theoretical explanation, and expands its theoretical research perspective. When choosing management methods, it can make full use of the relationship between employees within the organization to more effectively affect the organization. Through management, through the development and cultivation of the positive psychological capital of employees, the loyalty of members to the organization is strengthened, the turnover rate is reduced, and the organizational performance is finally improved, and the organizational goals can be completed more efficiently.

This paper combines the data simulation model to analyze the health effects of social capital and psychological capital and combines the intelligent simulation model to improve the intelligent effect of the research results, which provides a reference for subsequent research.

2. Related Work

Literature [4] believes that social capital is inseparable from social network and is a collection of actual or potential resources. Its views on social capital have far-reaching implications for subsequent research. Reference [5] defines the concept of social capital based on functional principles. It believes that social capital provides convenience to individuals in a social structure and is composed of different elements in the social structure. The concept of social capital has been developing continuously, and it has received attention not only in the field of sociology but also in economics and political science. Literature [6] argues that social capital is productive like other capitals and is an organizational characteristic such as trust, norms, and networks. Literature [7] studies the social capital in the context of Chinese culture through theoretical analysis and empirical research. It is believed that society is the same as social network, which is also composed of network size, network top, network difference, and network composition. Literature [8] divides social capital into "microsocial capital" and "macrosocial capital." Two types of social capital are defined, and it is believed that "microsocial capital" includes two kinds of resources: the first resource is the personal relationship and the resources contained in the personal relationship, and the second is the network structure position of the person. Up to now, social capital has been widely used in just a few decades, which is related to its strong explanatory power. But so far, the concept of social capital has not been unified, and there are constant debates. From the perspective of the new generation of migrant workers, literature [9] believes that social capital is the main. It consists of two parts: primitive social capital and new type of social capital. Primitive social capital is innate, mainly composed of blood and geography, including relatives, friends, and fellow villagers. New type of social capital refers to the social contacts cultivated, such as citizens, friends, colleagues, and others.

The connotation of psychological capital first appeared in management, sociology, and other research fields. Regarding the concept of psychological capital, there are three main academic views: trait theory, state theory, and synthesis theory [10]. Literature [11] puts forward the concept of psychological capital, which is a representative of trait theory. It believes that psychological capital refers to the personality traits formed by the interaction between innate and acquired, including relatively stable psychological characteristics such as individual self-perception, work attitude, and values.. Literature [12] takes positive psychology and positive organizational behavior as the theoretical basis and points out a positive psychological state of the individual, and this positive psychological resource can promote the individual to produce positive behavior and obtain higher performance. Literature [13] defines psychological capital from the perspective of synthesis theory but also a personality trait formed by an individual through acquired training, which is a combination of trait theory and state theory. The synthesis theory is the latest viewpoint on the research of the connotation of psychological capital. It can be seen that scholars have more comprehensive and comprehensive research on the connotation of psychological capital, which has certain implications for future research on psychological capital. In literature [14], it is believed that the sum of the positive abilities possessed by psychological capital in the process of life development can achieve self-affirmation and achievement through effective strategies and the development of these positive abilities. Literature [15] believes that psychological capital is a relatively stable positive psychological state, which enables individuals to show positive behaviors in their growth and development. It is composed of elements such as self-efficacy, hope, optimism, resilience, self-esteem, gratitude, and evaluation of individual development.

Literature [16] found that the overall concept of psychological capital or individual elements promoted individuals' organizational commitment, job satisfaction, leadership effectiveness, political success, and job performance, reduced individual job stress, and enhanced subordinates' optimism, retention tendency, and job retention. Job satisfaction drives the effectiveness of organizational change and improves organizational resilience, profitability, and company performance. Some scholars have discussed the interrelationship [17]. Literature [18] studied the impact of individual human capital and social capital on job performance. Literature [19] theoretically distinguishes the difference between psychological capital effect and social capital effect. Literature [20] found through empirical research that psychological capital has a greater impact on job satisfaction and

organizational commitment than human capital and social capital.

3. Data Simulation Model

So far, the models used for early-warning of capital environment mainly fall into two categories:

One is to directly use the capital environment and quality indicators to characterize the quality of psychological capital and future trends based on the environmental quality and index quality of the health early-warning object.

The other type is the index early-warning model. Through the early-warning index system constructed, a certain calculation method is used to calculate the total early-warning index according to the indicators reflecting the early-warning situation to reflect the development trend of the capital environment. There are two types of grades that are often used.

One is to divide the early-warning of capital environment into three modes: bad state early-warning, negative evolution early-warning, and deterioration speed early-warning. If it is assumed that an early warning can be made for the health and environment at a certain time T in the future at r, the early-warning period is $\Delta t = T - t$. $E(t)$ represents the psychological capital quality score value, and the parameter EP represents the critical value of the bad state early-warning is the health and environmental quality score value. The parameters $\Delta\mathrm{EP}_t$ and $\Delta\mathrm{EP}_x$ represent the early warning of the deterioration trend and the early-warning of the deterioration speed, respectively, and are the critical value of the rate of change of the quality score value in the period ar. When the change of the early-warning evaluation object has random uncertainty, the parameter with the guarantee rate a is used as the constraint condition of the early-warning evaluation. In this way, given the guarantee rate a, parameters EP, $\Delta\mathrm{EP}_t$, and $\Delta\mathrm{EP}_x$, the psychological capital, and its safety early-warning evaluation and determination mathematical model are expressed as follows:

Bad state early warning is $W\{\mathrm{EP}_1 < E(t) < \mathrm{EP}_2\} > a$.

In the formula, when $\mathrm{EP}_1 = 2$ and $\mathrm{EP}_2 = 4$, it means a bad state early warning, and when $\mathrm{EP}_1 = 0$ and $\mathrm{EP}_2 = 2$, it means a bad state early warning.

In the 5-year plan, $\Delta\mathrm{EP}_x = 1/5(1/a)$. Generally, the target early-warning coefficient method can also be used to determine. Its formula is

$$R = \frac{X_t}{X_0} - 1. \tag{1}$$

In the formula, R is the early-warning system,

$$R_j = \left(N_j, C_i, V_{ji}\right) = \begin{bmatrix} N_j & C_1 & V_{j1} \\ & C_2 & V_{j2} \\ & \vdots & \vdots \\ & C_n & V_{jn} \end{bmatrix} = \begin{bmatrix} N_j & C_1 & \langle a_{j1}, b_{j1}\rangle \\ & C_2 & \langle a_{j2}, b_{j2}\rangle \\ & \vdots & \vdots \\ & C_n & \langle a_{j1}, b_{j1}\rangle \end{bmatrix} \tag{2}$$

is the the actual value of the early-warning indicator, and X_0 is the early-warning target value.

Then, the early warning is divided into five health levels f as described above, and the corresponding matter-element is established by inductive definition:

$$R_j = \left(N_j, C_i, V_{ji}\right) = \begin{bmatrix} N_j & C_1 & V_{j1} \\ & C_2 & V_{j2} \\ & \vdots & \vdots \\ & C_n & V_{jn} \end{bmatrix} = \begin{bmatrix} N_j & C_1 & \langle a_{j1}, b_{j1}\rangle \\ & C_2 & \langle a_{j2}, b_{j2}\rangle \\ & \vdots & \vdots \\ & C_n & \langle a_{jn}, b_{jn}\rangle \end{bmatrix}, \tag{3}$$

where N_j represent j security levels, V_{ji} is the value range $\langle a_{ji}, b_{ji}\rangle$ of N_j with respect to its characteristic C_i, R_j is the classical language, the section field corresponding to the classical language is R_p, and $R_p \supset R_j$:

$$R_p = \left(N_p, C_p, V_{pi}\right) = \begin{bmatrix} N_p & C_1 & V_{p1} \\ & C_2 & V_{p2} \\ & \vdots & \vdots \\ & C_n & V_{pn} \end{bmatrix} = \begin{bmatrix} N_p & C_1 & \langle a_{p1}, b_{p1}\rangle \\ & C_2 & \langle a_{p2}, b_{p2}\rangle \\ & \vdots & \vdots \\ & C_n & \langle a_{pn}, b_{pn}\rangle \end{bmatrix}. \tag{4}$$

Among them, N_p represents the whole range of grades, and similarly, V_{pi} is the value range $\langle a_{pi}, b_{pi}\rangle$ of N_p with respect to its characteristic C_i. The matter-element that defines the early-warning object is expressed as

$$R_x = (p_x, c_i, v_i) = \begin{bmatrix} p_x & C_1 & V_1 \\ & C_2 & V_2 \\ & \vdots & \vdots \\ & C_n & V_n \end{bmatrix}. \tag{5}$$

The degree to which the state value v_i of the early-warning index c_i of the early-warning object belongs to a certain security level is equivalent to the degree. The difference is that the membership range is in the [0.1] interval, and we map it to the real axis $[-\infty, +\infty]$. Then, the degree to which the value of the ith indicator of the early-warning object is defined to be associated with the jth security level range is

$$F_j(v_j) = \begin{cases} \dfrac{\rho\left(v_i, V_{ji}\right)}{\rho\left(v_i, V_{pi}\right) - \rho\left(v_i, V_{ji}\right)}, \rho\left(v_i, V_{pi}\right) - \rho\left(v_i, V_{ji}\right) \neq 0, \\ -\rho\left(v_i, V_{ji}\right) - 1, \rho\left(v_i, V_{pi}\right) - \rho\left(v_i, V_{ji}\right) = 0. \end{cases} \tag{6}$$

Among them, V_{ji} is the range of the classical language, V_{pi} is the range of the section field, and $\rho(v_i, V_{ji}) = |V_I - (a_{ji} + b_{ji})/2|$, $\rho(v_i, V_{Pi})$ is the distance between the value v_i

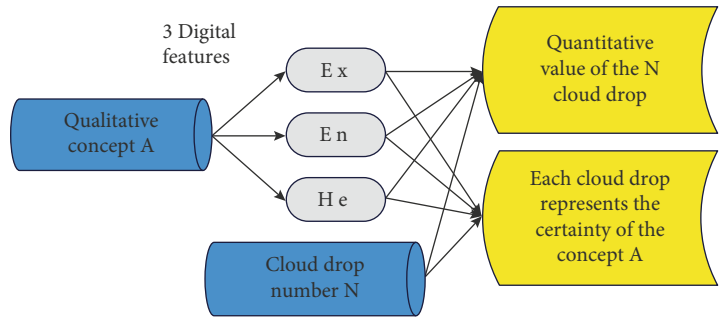

Figure 1: Schematic diagram of forward cloud generator.

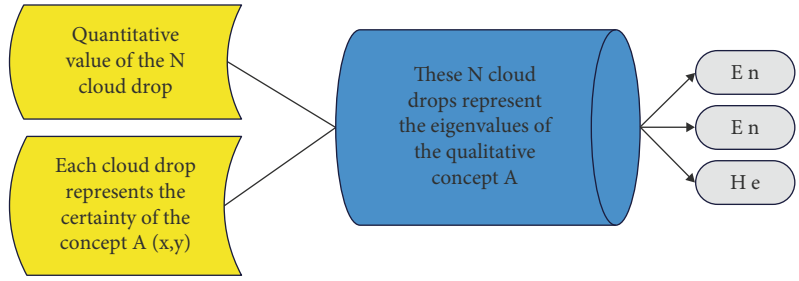

Figure 2: Schematic diagram of the backward cloud generator.

of c_i, and the range interval $\langle a_{ji}, b_{ji}\rangle$ and $\langle a_{pi}, b_{pi}\rangle$:

$$\rho(v_i, V_{ji}) = \left|V_i - \frac{a_{ji}+b_{ji}}{2}\right| - \frac{b_{ji}-a_{ji}}{2}; \rho(v_i, V_{pi}) = \left|V_i - \frac{a_{pi}+b_{pi}}{2}\right| - \frac{b_{pi}-a_{pi}}{2}. \quad (7)$$

If $G_j(v_i) = \max F_j(v_i), j \in (1, 2, \cdots, m)$, the early-warning indicator v_i belongs to level j. The total index state of the early-warning object can be represented by $F_j(R_x) = \sum_{i=1}^{n} w_i F_j(v_i)$, where w_i is the weight coefficient of the index i, which can be determined by methods such as entropy weight method. If $G_j(v_i) = \max F_j(v_i), j \in (1, 2, \cdots, m)$, the overall early-warning object R_x belongs to class j_x. Finally, the early-warning object is judged to make red, orange, yellow, green, and blue early-warning according to the level range to which j_x belongs.

The actual demand and application have led to the universality of the normal distribution, and the normal cloud has also been widely used. Its mathematical expectation curve MEC is expressed by

$$\mathrm{MEC}(x) = \exp\left[\frac{-(x-Ex)^2}{2En^2}\right]. \quad (8)$$

The forward cloud generator is a qualitative to quantitative mapping, which generates cloud droplets according to the cloud's numerical characteristics (Ex, En, and He). The schematic diagram of forward cloud generator as shown in Figure 1:

Schematic diagram of the backward cloud generator as shown in Figure 2:

The specific steps are as follows:

In the first step, the value of formula (10) is used as the estimated value of Ex:

$$\hat{E}x = \frac{1}{n}\sum_{i=1}^{n} x_i. \quad (9)$$

The second step is to leave m cloud droplets and ignore the remaining points with $y > 0.999$.

The third step is to find En from formula (11) according to the values of Ex and (x, y);

$$Ex = \left|x - \hat{E}x\right| / \left(-\sqrt{2\ln y}\right). \quad (10)$$

The fourth step is to find the estimated value $\hat{E}n$ of En according to

$$\hat{E}n = \frac{1}{m}\sum_{i=1}^{m} En_i. \quad (11)$$

The fifth step is to obtain the estimated value $\hat{H}n$ of He according to

$$\hat{H}n = \sqrt{\frac{1}{n-1}\sum_{i=1}^{m}\left(En_i' - \hat{E}n\right)^2}. \quad (12)$$

In this way, the three eigenvalues of the N cloud droplets representing the qualitative concept are obtained, so that the

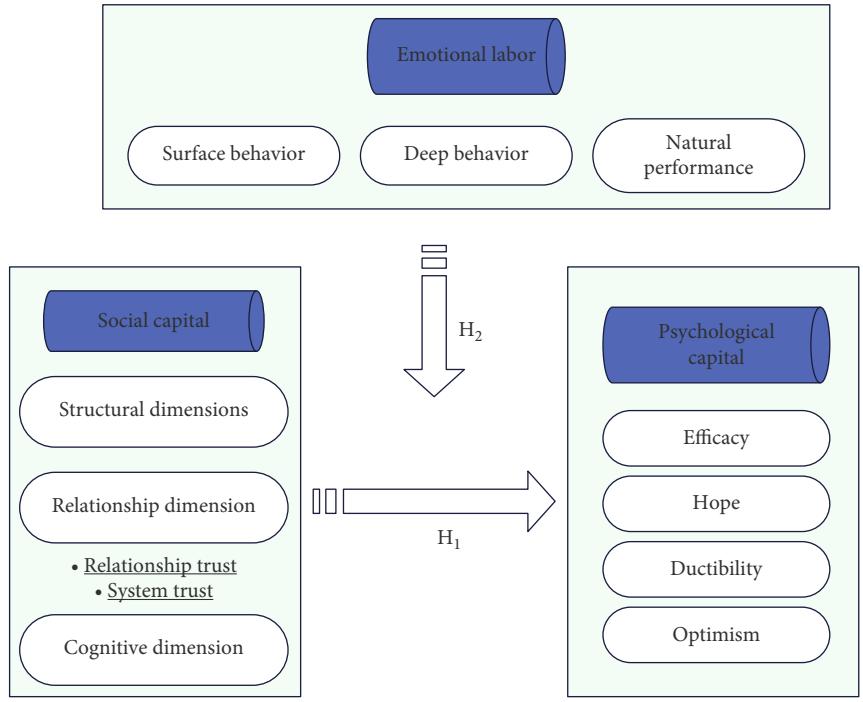

Figure 3: Research model.

qualitative concept can be clarified according to the actual situation.

We use cloud models for knowledge mining. Generally speaking, it first finds several qualitative concepts of the mining object and divides the degree of ambiguity of each qualitative concept. For example, academic performance can be divided into four levels: excellent, good, moderate, and poor. It then builds a cloud model for the concept, determining the digital characteristics that belong to the cloud. Finally, by synthesizing each concept, valuable information can be mined according to the comprehensive fuzzy set and related indicators.

3.1. Identification of Concept Types and Characteristics. n eigenfactors $(x_1, x_2, \cdots, x_m)$ are extracted, each eigenfactor has a corresponding actual meaning (which may include multiple fuzzy divisions), and each meaning corresponds to a numerical value (which may be a numerical interval).

3.2. Construction of the Normal Cloud Model. (1) According to the eigenfactors extracted before and the needs of the actual problem, the fuzzy set of attribution type corresponding to the eigenfactors is defined as $\{A_1, A_2, \cdots A_n\}$

(2) Establish a subordinate cloud model

To determine the membership cloud of n fuzzy sets $\{A_1, A_2, \cdots A_n\}$ is to determine the three digital eigenvalues (Ex, En, and He) of the membership cloud of n fuzzy sets. According to statistical analysis and calculation, it can be determined that the three digital characteristics of the membership cloud of n fuzzy sets are $A_1(Ex_1, En_1, He_1)$, $A_2(Ex_2, En_2, He_2), \cdots, A_n(Ex_n, En_n, He_n)$. According to the three digital features, the forward cloud generator algorithm is used to calculate the membership degree $\mu_{A_i}(x)(i = 1, 2, \cdots, n)$ of each feature factor relative to the fuzzy set.

3.3. Knowledge Representation. $f(x) = (x_1, x_2, \cdots, x_n)$, $f(x)$ represent the specific positioning mode of knowledge, and the comprehensive fuzzy set $H = A_1 \oplus A_2 \oplus \cdots \oplus A_n$ represents a comprehensive level index.

Through the uncertainty conversion model of the cloud model between a qualitative concept and its quantitative representation, complex data and fuzzy concepts are converted into subordinate cloud models and digital features corresponding to their concepts. Moreover, after analysis and calculation, the valuable classification information finally obtained will guide the decision-making, analysis, prediction, and so on in various fields.

4. Health Effects of Social Capital and Psychological Capital Based on Data Simulation Model

In this paper, social capital is divided into three dimensions: (1) structural dimension; (2) relational dimension, including: relationship trust and institutional trust; and (3) cognitive dimension. Emotional labor mainly includes three dimensions: (1) surface acting, (2) deep acting, and (3) natural acting. Psychological capital includes four dimensions: (1) self-efficiency, (2) hope, (3) resilience, and (4) optimization. Based on the above research, the research model of this paper is constructed, as shown in Figure 3.

The simulation data mining framework is mainly composed of the following parts: (1) model document database, (2) data extraction and conversion module, (3) data

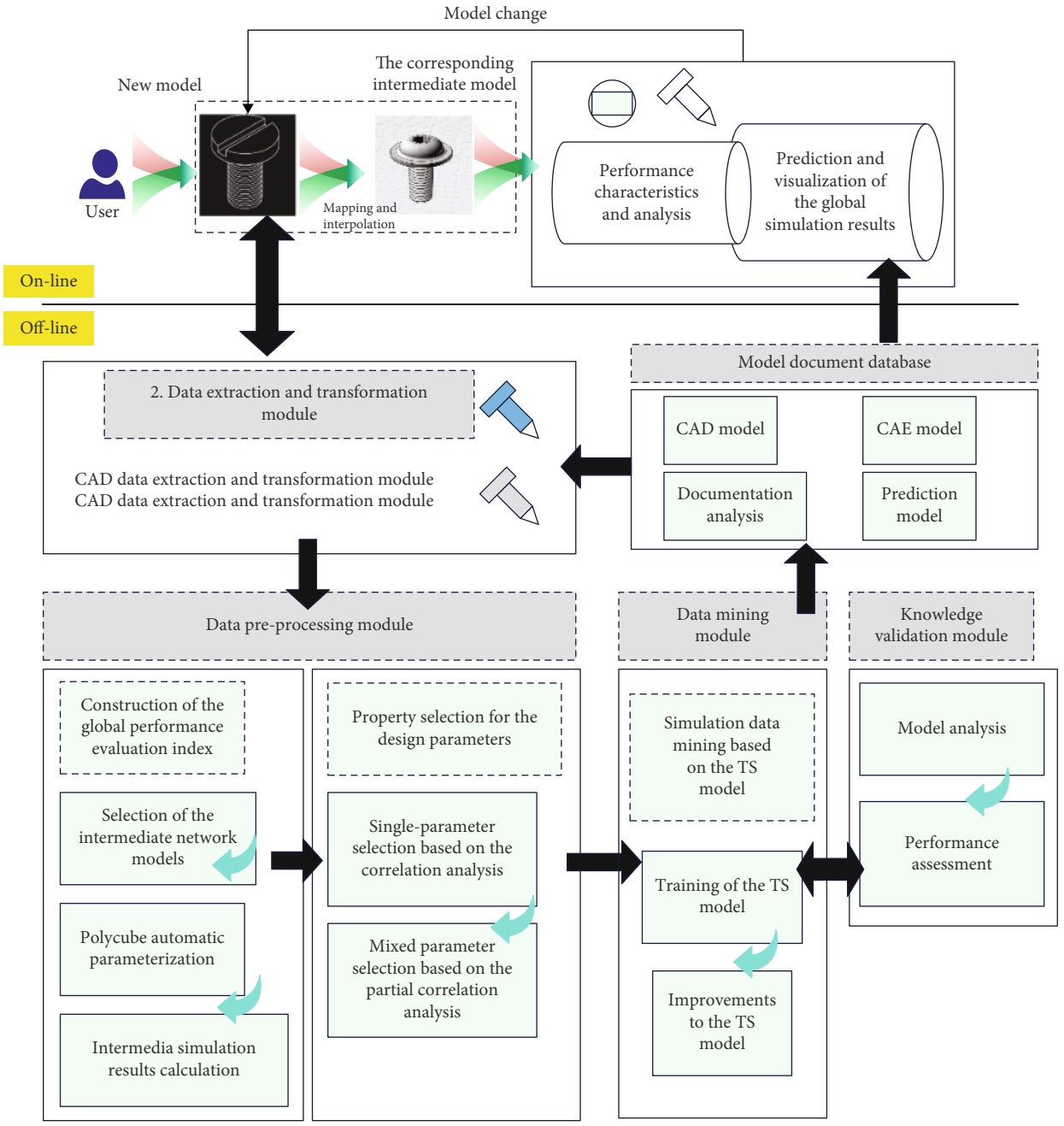

Figure 4: Simulation data mining framework.

preprocessing module, (4) data mining module, (5) knowledge verification module, and (6) online prediction module. The specific frame structure is shown in Figure 4.

The mapping interpolation relationship between the intermediate grid model based on social capital and psychological capital and all the original simulation grid models is established on the Polycube parameter domain. After that, the intermediate simulation results corresponding to the original simulation model are obtained, and then, a unified global performance evaluation index is obtained. The simulation data of the original simulation mesh model is mapped and interpolated to the intermediate mesh model to obtain the corresponding unified global performance evaluation index in Figure 5.

This paper seeks an efficient distributed simulation data collection method. The collection method can flexibly customize various collection tasks before or during simulation execution. The collection task can collect not only the public data of the simulation entity but also its private data and can collect events (interaction data) in the simulation. The collection method can ensure a certain real-time monitoring function and must operate under the conditions that the performance of the original simulation system is not affected as much as possible. The biggest advantage of mobile agent

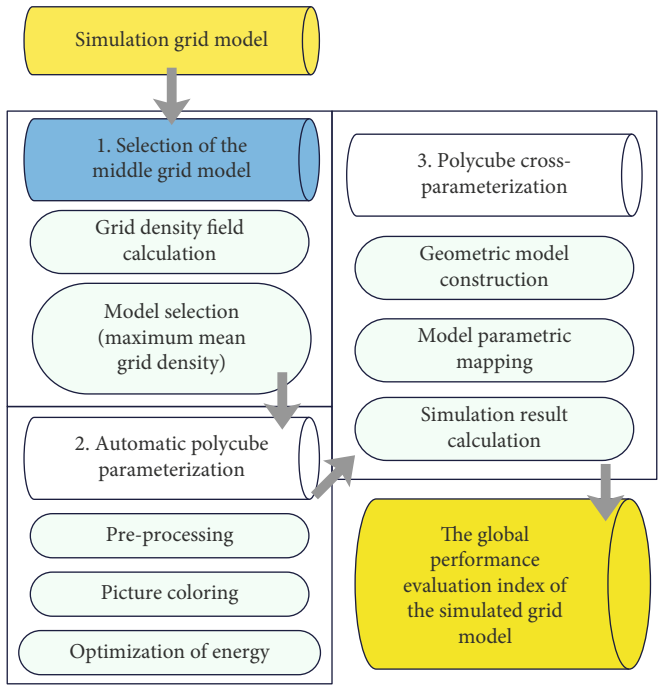

Figure 5: Construction process of global performance evaluation indicators.

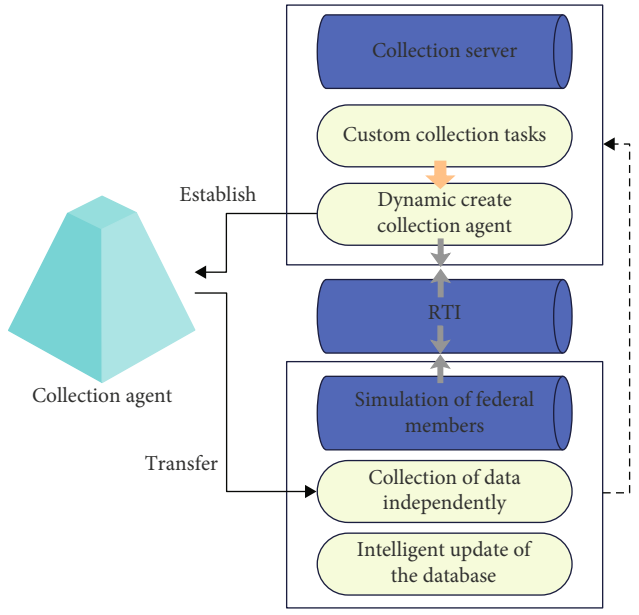

Figure 6: Schematic diagram of the data collection method.

lies in the improvement of its network performance. It does not need to keep the transmission of control information with the server at all times and executes tasks autonomously. The principle of applying mobile agent to data collection is shown in Figure 6.

Mobile agent data collection service is an auxiliary function in the simulation system. Its hierarchical structure is shown in Figure 7. HLA service layer is the foundation of HLA-based distributed interactive simulation system, it provides various basic services of distributed interactive simulation, and the data collection service based on mobile agent is also based on this foundation. The simulation data layer organizes the data that needs to be collected in the federation members in a certain structure and provides a convenient interface for the data collection layer. The data collection service will obtain the data inside the simulator and the public data in the HLA from the interface. Moreover, each mobile agent can autonomously perform different data collection tasks. The collection objects and real-time requirements of collection tasks may be different. Therefore,

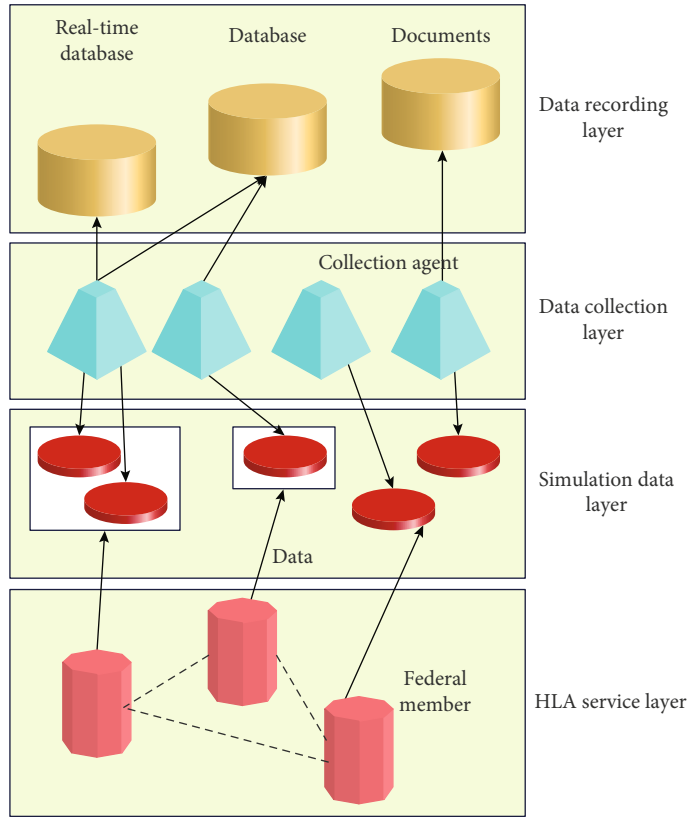

Figure 7: Hierarchy diagram of data collection.

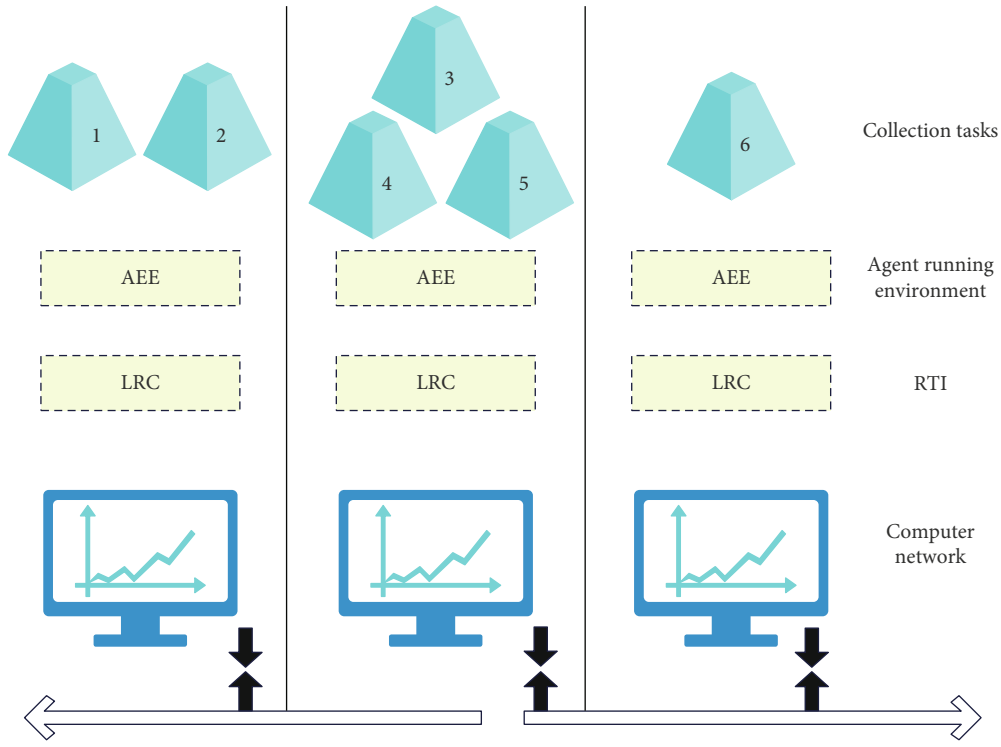

Figure 8: Network hierarchy of data collection methods.

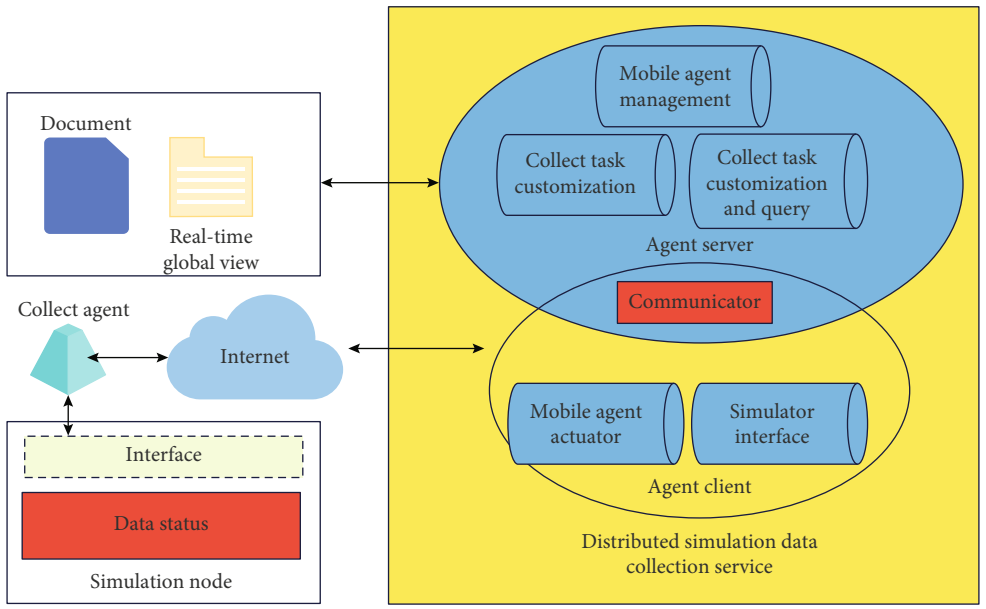

Figure 9: Structure diagram of the prototype system.

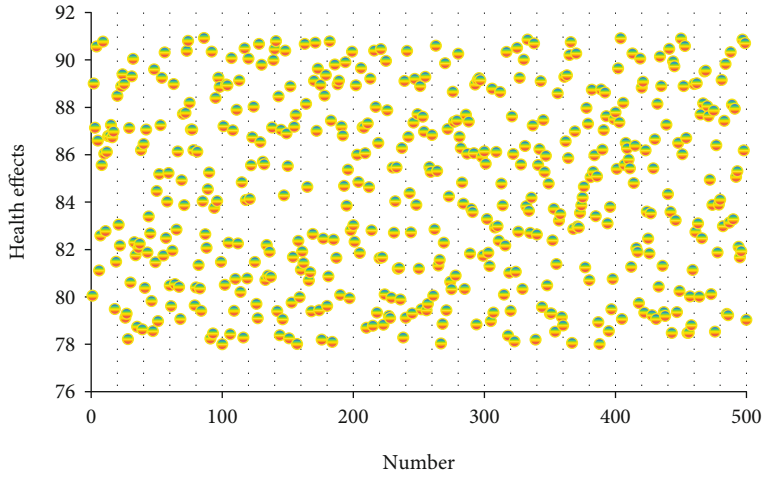

Figure 10: Validation of the health effect model of social capital and psychological capital based on the data simulation model.

refining the collection task can effectively reduce the impact on the original simulation system. The role of the data logging layer is to store and query the collected data, which can be a file or a traditional database management system, or a real-time database.

The network architecture of the mobile agent data collection method is similar to the ISO/OSI seven-layer protocol, which is divided into the computer network layer, the RTI layer, and the collection task layer of the agent operating environment level, as shown in Figure 8.

According to the description in the previous chapter, the simulation data collection service should be divided into two parts: collecting agent client and collecting agent server. The distributed interactive simulation data collection is roughly divided into the following four stages: the selection of the collected data, the data collection, the data storage, and the data acquisition. Therefore, the data collection service needs to meet the functions of the above four stages. The respective included functions of the collection server and collection client are shown in Figure 9.

On the basis of the above research, the effect of the health effect model of social capital and psychological capital based on the data simulation model proposed in this paper is verified, and the effect of statistical clustering is evaluated, as shown in Figure 10.

From the above research, we can see that the health effect model of social capital and psychological capital based on the data simulation model proposed in this paper is effective. On this basis, this paper combines the simulation research to carry out the data operation simulation of the model in this paper, calculate the data operation simulation effect, and obtain the results shown in Table 1.

From the above research, it can be seen that the health effect model of social capital and psychological capital based

Table 1: Simulation effect of data operation.

Number	Data simulation	Number	Data simulation	Number	Data simulation
1	91.49	23	91.30	45	91.84
2	92.65	24	94.78	46	94.00
3	92.83	25	94.27	47	91.31
4	91.88	26	91.76	48	91.01
5	90.56	27	90.39	49	91.10
6	89.01	28	91.43	50	90.23
7	91.55	29	94.94	51	91.63
8	93.23	30	90.51	52	89.64
9	89.69	31	89.21	53	91.53
10	92.85	32	89.31	54	91.54
11	90.61	33	92.03	55	89.41
12	93.19	34	94.38	56	93.07
13	89.42	35	92.87	57	91.26
14	89.16	36	92.59	58	91.35
15	91.39	37	93.30	59	93.35
16	93.12	38	91.44	60	94.33
17	94.15	39	91.90	61	92.24
18	92.42	40	91.93	62	94.22
19	94.72	41	91.49	63	93.15
20	92.72	42	90.22	64	93.18
21	89.18	43	91.38	65	91.55
22	91.05	44	92.71	66	91.18

on the data simulation model proposed in this paper can analyze the health effect of social capital and psychological capital by means of data simulation, which has a certain reference for subsequent related research.

5. Conclusion

With the advent of the era of knowledge economy, people's attention to the source of enterprise competitive advantage is not only limited to traditional economic capital such as physical capital and human capital but also pays more and more attention to intangible capital such as social capital and psychological capital. The rise of social capital theory has made social capital widely valued by scholars from different disciplines at home and abroad. Moreover, some researchers have extended the research of social capital theory to the enterprise level and discussed the concept, dimension, and utility of enterprise social capital. Therefore, the research on social capital from the internal level of the enterprise is favored by many scholars in the field of enterprise management and organizational behavior. The research results show that the health effect model of social capital and psychological capital based on the data simulation model proposed in this paper can analyze the health effect of social capital and psychological capital by means of data simulation and has a good analysis effect.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare no competing interests.

Acknowledgments

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