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Group Intelligence and Psychodynamics: Intelligent Motivation and Psychological Factors in Employees' Group Behavior

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Abstract: In today's society, due to the change and development of working conditions, it is particularly important to analyze the intellectual motivation and psychological factors of employee group behavior. This paper designed an incentive mechanism and reward system based on swarm intelligence (SI) and psychological dynamics to improve staffs' intelligent behavior and work performance. Through the relevant research on employee behavior data set, psychological factor data set and performance data set, the research results show that incentive mechanism and reward system play a positive role in employee satisfaction. It can improve staffs' recognition and sense of value of work and promote staffs' achievement of goals and performance to some extent. Enterprises can formulate and implement effective incentive measures to improve employee satisfaction and work motivation, and promote the achievement of goals and performance improvement.

Keywords: Swarm Intelligence; Psychological Motivation; Staffs Group Behavior; Intelligent Incentive; Psychological Factor

1. Introduction

Whether within the organization or in the working environment, the behavior of the employee group is an important factor affecting the success and performance of the organization. In order to improve staffs' work efficiency and creativity, researchers continue to explore various approaches and influencing factors [1]. Therefore, it is particularly important to study the psychological causes and motivations behind staffs' behaviors. However, relying solely on psychodynamic studies cannot fully reveal the complexity of employee group behavior [2]. Therefore, combining with the theory of SI, it is very important to analyze the intellectual motivation and psychological factors in the group behavior of staffs.

Past research has demonstrated the importance of psychological motivation in employee behavior. By studying the impact of emotional intelligence on organizational commitment, Alsughayir A deeply explored the impact of employee motivation, attitude and emotion on job performance and organizational effectiveness [3]. These studies provide valuable insights into the relationship between employee behavior and psychological motivation. However, these studies still have some shortcomings to

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some extent. Although psychodynamic research has an important impact on employee group behavior, these studies often ignore the existence of SI in employee groups. Staffs groups are often composed of many people, whose intelligence and collaboration ability play a key role in team performance [4]. Therefore, by combining SI and psychodynamics, it can better understand the intellectual motivation and psychological factors of staffs' group behaviors.

This paper combines the theory of SI with the theory of psychodynamics to conduct an in-depth analysis of the intellectual motivation and psychological factors that affect the group behavior of staffs. This project comprehensively uses various research methods such as questionnaire survey, experimental design and case analysis to explore the interaction mechanism between SI and psychological dynamics. Through the research of this project, this project would provide theoretical basis and practical guidance for enterprises how to optimize employee group behavior.

2. Psychological State, Attitude, Motivation and Emotion of the Staffs Group

The psychological state of an employee group refers to the overall psychological feelings and emotional states of staffs in the working environment. The specific classification of psychological factors is shown in Table 1.

Table 1. Classification of employee group psychological factors

Classification	Describe
Psychology	Emotional stability
	Emotional expression
	The overall feeling of the working environment
Attitude	Attitude towards work tasks
	Attitudes towards the organizational culture
	Attitudes towards the relationships between colleagues
Motive	Internal motivation
	External motivation
Mood	Positive mood
	Negative emotions

The psychological factors of staffs mainly include: emotional stability, emotional expression and the overall feeling of the working environment. Psychological state is an important factor affecting staffs' work performance and team cooperation [5-6]. Staffs attitude refers to the employee's opinion and evaluation of his/her work, organization and colleagues. This includes tasks, company culture and relationships with colleagues. Employees' attitude has an impact on their work commitment, job satisfaction and the effect of team cooperation [7]. Staffs motivation refers to the intrinsic motivation of staffs in their work. Motivation can be divided into internal motivation and external motivation. Internal motivation refers to staffs' interest in their own work and the need for self-realization, while external motivation refers to staffs'

response to external rewards and incentives. The motivation level of staffs has a significant impact on their work involvement, innovation ability and performance [8]. Staffs emotion is the emotional experience and emotional expression experienced by staffs in their work. This includes both positive and negative emotions. The emotional state of staffs has an important impact on their work efficiency, decision-making ability and team atmosphere [9]. Research on the psychological state, attitude, motivation and emotion of staffs can help people deeply understand the internal experience and psychological state of staffs at work, and find the key factors affecting the intelligent behavior of staffs [10]. On this basis, this project proposes an effective psychological intervention and management strategy to improve the intelligent performance of staffs and promote innovation and collaboration.

3. Design of Incentive Mechanism and Reward System on SI

Psychological factors have a variety of influences on intellectual behavior, and their influencing factors and degrees vary with individual differences and specific circumstances. Emotionally stable staffs are better able to focus, process information better, and make decisions more calmly, whereas emotionally volatile staffs affect clarity of thought and the quality of decision making. Positive emotion expression can promote innovative thinking and teamwork, while negative emotion expression can cause communication barriers and conflicts [11]. Employees who feel good in their work environment are more motivated and engaged in their work. On the contrary, staffs who feel bad in the work environment would have stress and dissatisfaction, which would affect performance. People who have a positive attitude towards their work show more motivation and efficiency in their work. Negative attitudes can lead to procrastination and distraction [12]. Employees with a positive attitude toward corporate culture have a stronger sense of belonging and loyalty, while staffs with a negative attitude toward corporate culture have a lower degree of participation and participation. Positive cooperation and team spirit can promote cooperation and knowledge sharing, while negative attitude would lead to cooperation barriers and team disharmony [13]. Employees with drive have strong creativity, consciousness and autonomy, have strong learning enthusiasm and strong autonomy. External motivation enables staffs to do their jobs better, perform their jobs better, and achieve their goals better. Positive emotions help improve creative thinking, flexibility, and problem solving [14]. Negative emotions would reduce people's attention, affect people's attention, reduce people's decision-making quality, and thus affect people's work efficiency and creativity.

In order to stimulate the SI behavior, this paper designs an incentive and reward mechanism, and according to the specific situation of the organization, the form of bonuses, welfare or promotion opportunities to encourage and reward the SI behavior. On this basis, this paper introduces collaborative learning and collaborative innovation technologies in SI to improve the interaction and collaboration ability of team members by means of team projects, team discussions and knowledge sharing platforms. In addition, the personal growth plan is also very important. The system design of this paper includes a personal growth plan, and individual learning and individual decision-making techniques in SI method are used to set personal goals for group members. They can be provided with training, mentorship and other support to help them improve their personal abilities and skills. The team decision-making and team

negotiation techniques in SI method can improve the mutual trust and cooperation among team members. In addition, the performance evaluation and feedback technology is also used to design a performance evaluation system, regularly evaluate the work done by team members, and give timely feedback and rewards [15]. In this paper, the SI index is used to evaluate the collaboration ability among team members. The formula is as follows:

$$GII = \frac{\sum_{i=1}^{n} A_i}{n} \tag{1}$$

n is the number of group members and A_i is the intelligence level of the i-th member of the individual. In addition, this paper evaluates Group Efficacy through group efficacy, whose calculation formula is as follows:

$$G = \frac{\sum_{i=1}^{n} B_i}{n} \times C \tag{2}$$

B_i is the performance of the i th individual and C is the collaboration performance.

4. Experimental Design

4.1. Selection of Data Sets and Evaluation Indicators

This paper takes employee behavior, psychological factors and performance data as research objects to support SI and psychodynamics research. Staffs behavior data mainly includes employee performance, creativity and cooperation effect. Psychological factors mainly include the employee's psychological status, emotional stability, work attitude. Performance data includes the organization's work performance, project results, innovation results, and so on.

This paper selects evaluation indicators such as work efficiency, goal achievement and employee satisfaction as the starting point to comprehensively evaluate the relationship between SI and psychological motivation. On this basis, the research results of this paper would help to deeply understand the internal relationship between SI and group dynamics, and then provide targeted improvement suggestions for improving team work performance, goal achievement and employee satisfaction. Through this study, this paper would help people better understand the relationship between SI and psychodynamics, and then provide decision support and management guidance for organizations.

4.2. Experimental Procedure

By selecting 6 staffs with different backgrounds and experiences as experimental subjects, this paper applies the designed incentive mechanism and reward system to the working environment where the experimental subjects are, ensuring the transparency

and fairness of the implementation process, so that staffs can understand and participate in it. Before and after the implementation of SI incentive mechanism and reward system, this paper collects and observes relevant data, and compares and analyzes with employee behavior dataset, psychological factor dataset and performance dataset. The data before and after the experiment were evaluated. Based on the results of the evaluation indicators, it analyzes the effectiveness and feasibility of SI incentive mechanism and reward system, discusses the contribution of the experimental results to SI research, and the way in which groups exhibit intelligent behaviors in the process of collaboration and decision making. Based on the experimental results and discussion, this paper draws a conclusion about the incentive mechanism and reward system of SI, and puts forward suggestions for improvement and optimization.

5. Data of Intelligent Motivation and Psychological Factors of Staffs Group Behavior

Through data sets and experimental design, the relevant data of employee behavior, psychological factors and performance collected in this paper are shown in Table 2.

Table 2. Staffs behavior, psychological factors and performance data

Staffs	Work completion	Team work	Job satisfaction	Emotional stability	Customer satisfaction
Staff 1	100	80	95	70	85
Staff 2	80	75	75	60	75
Staff 3	90	85	80	80	85
Staff 4	85	90	85	75	85
Staff 5	90	85	85	70	80
Staff 6	95	80	90	65	75

According to Table 2, it can be found that the 6 staffs have certain differences in behavior, psychological factors and performance. In particular, the customer satisfaction of staffs 1, 3 and 4 is high, reaching 85. In addition, the three staffs also performed well in terms of job completion, teamwork, job satisfaction and emotional stability. High customer satisfaction among staffs 1, 3, and 4 was associated with high levels of their work completion, teamwork, job satisfaction, and emotional stability. This indicates that these staffs show high efficiency and quality at work, and can cooperate well with team members, and their job satisfaction and emotional stability are high, which may reflect their positive attitude towards work and better emotional management ability. However, the situation of employee 6 is slightly different, although he has 95 work completed, his emotional stability is not high, and customer satisfaction is only 75, which indicates that he may encounter some emotional challenges in his work, thus affecting his customer satisfaction. Emotional stability is the key to good interaction and cooperation with customers or team members, so it is necessary for employee 6 to pay attention to and improve their emotional management ability, so as to improve customer satisfaction. This shows that there is a certain correlation between employee behavior, psychological factors and performance. Staff 1, Staff 3, and Staff 4 showed better performance and customer satisfaction in several

aspects, while Staff 6 had some challenges in emotional stability and customer satisfaction. This highlights the importance of psychological factors for employee performance and customer satisfaction, while also reminding organizations of the importance of managing and supporting the mental health of their staffs. In addition, through data analysis, the comparative data before and after the work effect evaluation indicators obtained in this paper are shown in Figure 1.

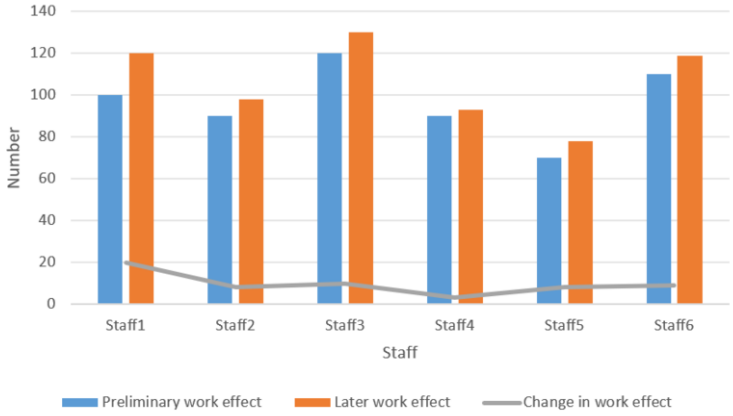

Figure 1. Data comparison before and after work effect

As shown in Figure 1, there are differences in the work effect data of the six staffs before and after using the designed incentive mechanism and reward system, and the work effect of the six staffs has been improved after using the system. Among them, Staff 1's work efficiency increased from 100 to 120, and Staff 4's work efficiency increased from 90 to 93. The results show that the designed incentive mechanism and reward and punishment system have a positive impact on staffs' work effectiveness. It is likely that Staff 1 has improved so much because the system has motivated the employee to be more focused and productive. While some other staffs have a smaller promotion range, but it can also see the effect of this system on their performance. This paper further proves the effectiveness of the incentive and reward system for improving employee performance, and points out that the establishment of the goal and reward system can stimulate the enthusiasm of staffs and improve their work enthusiasm and performance. The comparative data before and after the achievement of the employee's goal is shown in Figure 2, where the assignment of not achieving is 1, and the assignment of achieving is 2.

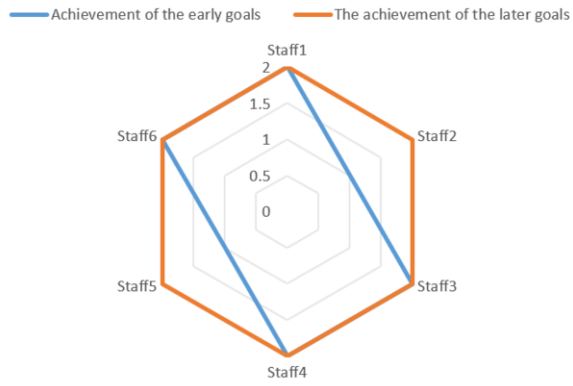

Figure 2. Comparison of data before and after goal achievement

As can be seen from Figure 2, after the reward mechanism and reward system designed in this paper are adopted, the goal achievement rate is 100%. Only four people reached the target before it was implemented. The results of this paper show that the designed incentive and reward system can effectively improve the work performance of staffs. By setting clear goals and reward mechanisms, staffs are motivated to increase their goal orientation and effort. This incentive mechanism encourages staffs to focus on achieving the goal, and also sets up a reward mechanism to affirm and encourage the efforts of staffs. After using this system, all staffs have reached the goal, which shows the effectiveness of the incentive mechanism and reward system. Such a system can motivate staffs to focus more on goals and take appropriate actions to achieve them. By setting goals and providing rewards and recognition, organizations can stimulate staffs' work motivation, improve goal orientation, and maximize the achievement rate of goals. To sum up, it can be seen from the data in Figure 2 that after using the incentive mechanism and reward system designed in this paper, the goal achievement rate of staffs has been significantly improved, reaching 100%. The results of this paper show the importance of incentive mechanism and reward system in improving staffs' achievement of goals. The comparison of data before and after employee satisfaction is shown in Figure 3.

Figure 3. Comparison of data before and after employee satisfaction

As shown in Figure 3, after adopting the incentive system and reward system designed by this research, employee satisfaction has been significantly improved, and it

has been greatly improved compared with before. Among them, staffs 2 and 5 have the most significant improvement in employee satisfaction. Among them, Staff 4 has the smallest improvement in satisfaction. Through incentives and rewards, staffs can feel that their work has been recognized and valued by the organization, so as to improve employee satisfaction. This incentive mechanism can create a positive working atmosphere for staffs and make them feel that their work is meaningful and valuable, thus improving their job satisfaction. Although the improvement of Staff 4's satisfaction is not large, the incentive and reward system can improve employee satisfaction to a certain extent. There are many factors that affect the improvement of satisfaction, including employee's personality characteristics, working environment, expectation and so on. Therefore, enterprises should consider the differences of staffs and formulate targeted incentive measures according to the needs and characteristics of different staffs to improve employee satisfaction. The changes of staffs' goal achievement and satisfaction are shown in Figure 4.

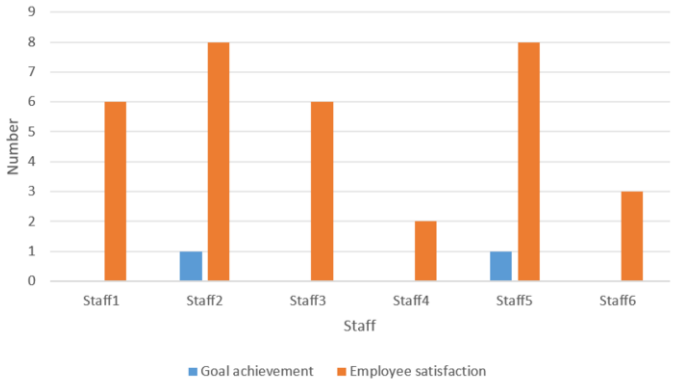

Figure 4. Change of goal achievement and employee satisfaction effect

It can be observed from Figure 4 that although the overall goal achievement situation and employee satisfaction show positive changes, the improvement of goal achievement situation is relatively general, and the improvement of employee satisfaction is also relatively small. Those with the highest levels of employee satisfaction increased by eight points, while those with the lowest levels increased by only two points. These data results show that after using the incentive mechanism and reward system designed in this paper, the goal achievement has improved, but the degree of improvement is not very significant. The effect of incentive and reward and punishment system on staffs to achieve the goal is limited, and it needs to be further improved and adjusted. At the same time, the improvement in employee satisfaction is not much. Although the overall satisfaction has improved, the improvement is not large, indicating that the impact of incentive and reward system on satisfaction still needs to be strengthened. In addition to the incentive system and reward system, employee satisfaction is also affected by many factors such as working environment, leadership style, personal growth opportunities, etc. Therefore, enterprises must comprehensively consider these factors and take appropriate countermeasures when improving employee satisfaction. Therefore, this study suggests that in the future, it can improve the performance and satisfaction of staffs by improving the incentive mechanism and reward system.

The results based on incentive mechanisms and reward systems have a positive impact on employee satisfaction to ensure that each employee has a clear understanding of their work goals and performance indicators, thereby better tracking their work progress and receiving rewards. Objectives and performance indicators should be specific, measurable, achievable and related to employee job responsibilities and core business. At the same time, a flexible reward system can be designed for employees, so that they have the opportunity to participate in different incentive activities, and give corresponding rewards according to their personal performance and contribution degree. Rewards can include salary increases, bonuses, benefits, promotion opportunities, etc. At the same time, it can ensure that the reward system is challenging and motivate employees to constantly improve their performance.

6. Conclusions

This paper aimed to explore the relationship between SI and psychological motivation, and design an incentive mechanism and reward system to improve staffs' intelligent behavior and work performance. Through the analysis of employee behavior data set, psychological factor data set and performance data set, it is concluded that incentive mechanism and reward system have a positive impact on employee satisfaction. After using the system, the overall satisfaction of staffs was improved, indicating that the incentive and reward system can enhance staffs' recognition and sense of value of their work, thereby increasing their satisfaction. Both goal achievement and employee satisfaction showed positive changes after the use of incentive mechanism and reward system. Although the improvement of goal achievement is relatively general and the improvement of employee satisfaction is relatively small, it still shows that incentive mechanism and reward system can promote employee behavior and performance to some extent. The incentive mechanism and reward system designed in this paper provide an effective management tool for the organization. By enhancing the intelligent behavior and work performance of staffs, organizations can promote teamwork and collaboration, improve employee satisfaction and well-being, reduce employee stress and fatigue, and thus achieve better performance and innovation.

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