

## Research Article

# Analysis of Persuasive Design Mechanism Based on Unconscious Calculation

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Received 9 December 2021; Revised 22 December 2021; Accepted 17 January 2022; Published 22 February 2022

Academic Editor: Baiyuan Ding

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In order to make users' behavior more standardized, a persuasive design mechanism analysis method based on unconscious calculation is proposed. Taking the concept of persuasion and the goal of persuading function as the theoretical basis, the user behavior data is obtained in the form of correlation calculation, and the ant colony algorithm is used to classify the behavior data. According to the results of data processing, analyze unconscious behavior and its characteristics, and obtain the persuasion mechanism through unconscious calculation, persuasion model, and persuasion model design. The experimental results show that the method in this paper has a higher acceptance of behavioral persuasion and higher satisfaction of the persuaded, indicating that the method has strong practical applicability.

## 1. Introduction

Guide the user's behavior to be more in line with the norms, improve the user's motivation and ability to complete the behavior, and enable them to develop good behavior habits so as to provide users with better services. Today, with the increasing popularity of Internet technology, persuasion technology can be used to change the behavior and attitude of users and to guide and persuade users' behavior [1–3]. At present, the application research of persuasion technology mainly involves the field of health, and its persuasion strategy is also proposed for the field of health. The research is more one-sided and only takes meeting the needs of users as the research goal, which cannot achieve behavior persuasion in the real sense. Therefore, we should induce and persuade users to develop or change their behavior through design intervention so as to achieve a purpose other than the design itself [4–6]. Based on this, how to intervene with the target users, persuade them, and improve the execution of the users is a topic that needs to be studied.

The application of persuasive technology in various fields needs to be realized through design. As a mode of thinking, persuasive design has been widely used in the cross-research of

design and other disciplines, including education, medical care, health, sports, games, advertising, e-commerce, and other fields. Persuasion is to achieve psychological and behavioral guidance through nonmandatory means. There are various ways of persuasion, mainly including direct diarrhea persuasion, impact persuasion, and retrograde persuasion. Direct persuasion is mainly for the purpose of informing. There is no specific persuasion object and no targeted behavior to persuade. It is only a popular persuasion method to understand things from the perspective of cognition, which is not persuasive. Impulse persuasion is a special persuasion method. It has specific persuasion objects and targeted target behaviors. Finally, it is necessary to clearly change the deep-rooted views and opinions of the persuasion objects. Retrograde persuasion refers to stimulating the change of behavior or attitude from the opposite point of view. Although the above persuasion methods can achieve behavior persuasion to a certain extent, in practical application, the acceptance of behavior persuasion is not high, there is a certain gap between the persuasion effect and the expected effect, and the persuader's satisfaction with the method is not high.

In view of the problems existing in the above persuasion methods, this paper proposes an analysis method of

persuasion design mechanism based on unconscious computing. Unconsciousness refers to a kind of consciousness that is unnoticed and unconscious. Unconscious thinking refers to the thinking process below the level of consciousness. Unconscious thinking plays a positive role in problem solving. Therefore, in the design of persuasion design mechanism, unconscious thinking calculation is introduced to further improve the persuasion effect.

## 2. Persuasion Concept and Functional Objective Analysis

*2.1. Persuasion Concept.* Persuasion is a concept in psychology, which refers to allowing the persuaded to accept content that is purposeful under noncompulsory circumstances. Persuasive design refers to the use of persuasive psychological methods in the design to allow users to change their attitudes toward the product or their behavior in using the product. Its main purpose is to guide users to perform purposeful operations. Based on the theory of persuasive design, a persuasive design model is proposed. This model contains three elements, namely, motivation, ability, and motivation point.

*2.1.1. Motivation.* Motivation refers to the user's internal reasons when performing operations or using behaviors. It can be divided into three categories: fun and pain, hope and fear, and social identification and social rejection. Among them, fun and pain are derived from human instinct, hope and fear are a result of human behavior, and social identification and social rejection are feedback level content after the behavior is over.

*2.1.2. Ability.* Capability refers to the ability of a user to complete a certain behavior. In the persuasive design theoretical model, the most important principle is simplicity. For example, in product design, the higher the ease of use of the product, the lower the requirements for the user's ability to complete the use of the product and the higher the user's sense of pleasure. Therefore, designers should try their best to reduce the requirements of products to users' ability in interactive design and make products more useable and easy to use. This principle is also applicable in other research fields.

*2.1.3. Promoting Point.* The promotion point refers to the clue provided to the user or a metaphor so that the user can complete the persuasive operation behavior. The promotion point can be related to motivation and promotion of the motivation elements of users. The promotion point can also be related to the ability to complete a certain behavior under the existing abilities of the user. Finally, the promotion point can also be a reminder behavior point to remind users of some operation behaviors.

In the process of persuasive design, according to the three elements of the persuasive design model, the guidance of user behavior is realized through the control of user

motivation, ability and promotion point. Only skillfully balancing the relationship between users' motivation, users' ability, and promotion point can design an effective persuasion mechanism.

*2.2. Persuasive Functional Goals.* Based on the description of the concept of persuasion, the persuasive design model, and its elements, the persuasion technology uses information as the external trigger element of behavior change to enhance the user's intrinsic motivation and behavior ability so as to achieve the purpose of persuading users to change their behavior. This process can be abstracted and become the basis for the realization of the persuasion mechanism. Based on this functional goal, through relevant technology to perceive, collect user behavior state data and environmental data included in the user persuasion target behavior context, and convert it into persuasion information that can be perceived by the user and generate behavioral ability and behavioral motivation. The purpose of persuading the target behavior can be achieved by timely selecting the appropriate carrier to convey information to user.

## 3. User Behavior Data Processing

According to the goal analysis of persuasion function, persuasion technology takes information as the external trigger element of behavior change. The information here specifically refers to user behavior data. Therefore, before the design of the persuasion mechanism, first process the user behavior data and obtain the user behavior data processing results through two steps of data mining [7, 8] and data classification [9, 10], and provide the necessary trigger elements for the design of persuasion mechanism.

*3.1. Behavioral Data Mining.* Assuming that the user behavior data is in a data area, the data in the entire area is described through the undirected traversal graph  $H = (A, B, C)$ , where  $A$  represents the node set,  $B$  represents the link set, and  $C$  represents the number of users in the area. Assuming that the data in the regional environment is composed of  $K$  regions, it is represented by a set form, specifically  $K = (k_1, k_2, \dots, k_n)$ , where  $n$  represents the number of data regions, and then the data flow density of the data region [11] can be expressed by formula (1):

$$\rho = 1 - \frac{d_c}{\alpha_c (x - 1)^2 + x}, \quad (1)$$

where  $\alpha_c$  represents the useful information in the data stream;  $d_c$  represents the community to which the data stream belongs;  $x$  represents the node where the data stream is located.

If  $W_i$  represents the amount of behavior data of a user  $i$  in the data area and  $G_w$  is the corresponding feature set, where  $w$  represents the user behavior feature, then the expression for the degree of association between user  $i$  and behavior feature  $w$  is

$$D_{iw} = \sum_{i=1}^N w_i \left\{ \log_{10} \left[ \frac{w_i}{\beta_i} + D(\lambda_i \parallel \varphi_i) \right] \right\}, \quad (2)$$

where  $\beta_i$  represents the correlation factor, which is related to the amount of data in the data area;  $N$  represents the number of users;  $\lambda_i$  represents the salient features of user  $i$ ;  $\varphi_i$  represents the insignificant features of user  $i$  [12, 13].

Since the persuasion mechanism is designed to persuade users' behaviors, persuasion is mainly oriented to the salient features of user behaviors, and the insignificant features that have a little impact can be ignored. Considering the above factors, if  $\mu_i^l$  represents the payload length of the salient features of user behavior in the data area environment and  $D$  represents the total length, formula (2) is optimized to obtain an improved correlation calculation expression:

$$\mu_i^l = \frac{\sum_{i=1}^N \sum_{j=1}^N D_i(\mu_{ij})}{\sum_{i=1}^N \sum_{l=1}^N D_l(\mu_{ij} + \omega_{ij})}, \quad (3)$$

where  $D_i$  represents the set of salient features of user  $i$ ;  $\mu_{ij}$  and  $\omega_{ij}$  represent the payload length and total length of salient features of user behavior, respectively. Combining formula (2) and formula (3), we can obtain the data of salient features of user behavior, that is, to achieve user behavior data mining.

**3.2. Classification of Behavioral Data.** Based on the results of user behavior data mining, in order to avoid behavior deviations in the persuasion process and improve the persuasion effect, further classification of behavior data can not only reduce behavior deviations but also improve the efficiency of persuasion. The traditional method mainly uses the support vector machine (SVM) method to classify data. This method is mainly suitable for static data. There are certain limitations to the dynamic data of user behavior data [14–16]; therefore, this paper adopts the ant colony algorithm [17–19] to optimize it.

Ant colony algorithm is an intelligent bionic algorithm through which the traditional SVM method is optimized and applied to user behavior data classification to achieve the purpose of improving the accuracy of persuasion results [20, 21]. The specific operation process is given as follows.

*Step 1.* Initialize the position and pheromone of the ant colony.

Determine the initial pheromone size of ant  $z$  through the SVM parameter range; the calculation formula is

$$E_z = e(z_i \parallel z_j) + (z'_i \parallel z'_j), \quad (4)$$

where  $z_i$  represents the initial pheromone concentration;  $z_j$  represents the initial search speed;  $z'_i$  and  $z'_j$  both represent the direction guidance vector.

In order to prevent the ant colony from accelerating the convergence, a fitness function  $X(t)$  [22] is set, and the fitness function  $X(t)$  is modified; then

$$X(t) = \max_{q=1,2,\dots,Q} \rho(S_q, S_p), \quad (5)$$

where  $S_q$  and  $S_p$  both represent genetic operators.

*Step 2.* Ant colony transfer.

Select the maximum pheromone concentration in the individual ant colony as the target individual, denoted by  $Y_{uf}$ .

$$Y_{uf} = \begin{cases} Y_{\text{best}}, & y \leq y', \\ Y', & \text{otherwise,} \end{cases} \quad (6)$$

where  $Y_{\text{best}}$  represents the optimal solution obtained in the iterative process, that is, the maximum value of the pheromone concentration [23, 24].

Determine the moving direction of ant  $z$ 's position by formula (7):

$$R_z = \sum_{z=1}^N [p(|\theta_z|) \times Y_{uf}]^t, \quad (7)$$

where  $\theta_z$  represents the expected moving direction of ant  $z$ .

To perform a local search for the ant in the dominant position in the data field, there are

$$H_z(A, B, C) = \sqrt{H_z(A)^2 + H_z(B)^2 + H_z(C)^2}, \quad (8)$$

where  $H_z(A)^2$ ,  $H_z(B)^2$ , and  $H_z(C)^2$  represent the relevant pheromone of nodes, links, and users in the data area.

*Step 3.* Pheromone update [25, 26].

After completing Step 1 and Step 2, update different pheromones. The specific update rules are as follows:

$$H_{abc}^z = \sum_{c=1}^N p_z \left( |\theta_{\omega_z \cap \alpha}| \right), \quad (9)$$

where  $\alpha$  represents the volatilization coefficient of the pheromone.

Through the above steps, it can be seen that the use of the ant colony algorithm to optimize the data classification effect of the traditional support vector machine method can obtain more accurate data classification results [27, 28] and provide a user behavior data basis for the persuasion mechanism design.

## 4. Analysis Method of Persuasive Design Mechanism Based on Unconscious Calculation

Through the above analysis, the results of user behavior data processing are obtained, and the design and design of the persuasion mechanism will be analyzed in detail in the following. Analyze unconscious behavior and its characteristics, and give the application case of the persuasion mechanism. On this basis, give the persuasion design model, design the persuasion model, and complete the design of the persuasion mechanism.

#### 4.1. Unconscious Calculation Analysis

*4.1.1. Analysis of Unconscious Behavior and Its Characteristics.* Unconscious behavior is an instinctive behavior made without subjective analysis and judgment, such as reflection and stress response, which can be designed persuasively by using the characteristics of unconscious behavior [29, 30]. For example, when passengers enter the security inspection device and leave the security inspection device, setting the two links to move continuously will make passengers unconsciously avoid light due to stress response, so as to achieve the effect of driving passengers, so that passengers can quickly pass the security inspection device. After the security check, leave quickly, thereby improving the efficiency of passengers' security check passage. Through the analysis of people's unconscious behavior, it can be found that unconscious behavior has the characteristics of universality, richness, and concealment. Almost everyone has unconscious behaviors in their behaviors. Unconscious behaviors are common in daily life and gradually integrated into their daily habits.

Unconscious behaviors are widely used in the design. Integrating unconscious behaviors into related designs can bring new design concepts to design and provide users with a natural user experience. A large number of unconscious behaviors run through people's increasingly frequent operation of mobile terminals [31, 32]. Introducing unconscious design into the persuasion mechanism design can enhance the user experience.

*4.1.2. Unconscious Calculation.* Based on unconscious behavior and its characteristics, unconscious computing has been studied. Unconscious computing has developed several times and has formed a variety of specific methods. Among these methods, the processing separation program (PDP) is still the best method. It separates conscious extraction and automatic extraction in simple recognition tasks by including tests and elimination tests. This paper intends to use the process separation program to separate the implicit and explicit components of unconscious behavior so as to realize unconscious computing [33, 34].

In order to explore the complex relationship between consciousness and unconsciousness, 5 (age: elderly, middle-aged, college students, junior high school, and junior high school) were adopted  $\times$  2 (contribution source: consciousness and unconsciousness). The contribution of consciousness and unconsciousness was calculated through the inclusion and exclusion test of the processing separation program (PDP). The specific process is as follows.

The subjects were divided into five age groups with 23 people in each group. All subjects were in good health and had a normal corrected vision. The age of the elderly group was 60–71 years. The age of the middle-aged group was between 30 and 55 years. The subjects in the university group were between 18 and 25 years old. The age of the subjects in the third group of junior middle school is between 14 and 15 years. The average age of the subjects in the high primary group was 11 years.

In the experiment, 50 specific pictures in the study of the best age of recognition ability were used as experimental materials. The whole experiment was divided into two stages: learning and testing. All subjects were tested separately. Ten of the 50 pictures were randomly selected as learning materials. In the learning phase, the learning time of each material is 2 seconds. In the test stage, each learned material and 4 unlearned materials are grouped into a group, and then the 10 groups of materials are subjected to inclusion test and exclusion test successively. In the inclusion test, the subjects were told to recognize the materials just presented in the five pictures, and if they cannot recognize the pictures just presented, pick out the first picture they think of. In the exclusion test, the subjects were told to recognize the material just presented in the five pictures, but not this one, but another possible picture.

According to the results of the inclusion test and exclusion test in the processing separation program (PDP), the conscious and unconscious contributions of each age group to recognizing specific pictures are calculated by using the formula (see Table 1).

The results show that (1) there is a developmental separation between conscious and unconscious contributions; (2) the unconscious contribution of the elderly group was higher than that of the conscious contribution but did not reach a significant level. The other four groups showed that the level of conscious contribution was extremely significantly higher than that of the unconscious contribution.

According to the above analysis, this paper uses the processing separation program to separate the implicit and explicit components of unconscious behavior and realizes unconscious computing.

*4.2. Persuade Design Patterns.* Based on the unconscious computing theory, this paper determines five persuasion behavior components, constructs the persuasion behavior process mechanism, grasps the persuasion behavior psychological mechanism, analyzes the change mechanism of the five components and their overall impact on users' attitude and behavior, and takes it as a breakthrough in persuasion design. The structure of the persuasion behavior component is shown in Figure 1.

- (1) Clue reminder: in order to increase the degree of user substitution, design familiar, clear, and attractive scene themes and report on user behavior in real time
- (2) Behavior plan: in order to improve the user's execution ability, introduce environmental variables to stimulate behavior, design a reasonable plan, and provide a heuristic path [35, 36]
- (3) Execution plan: in order to maintain the persistence of behavior, create a clear task process and give positive encouragement and guidance
- (4) Social relevance: in order to enhance social recognition and improve behavior motivation, social sharing, self-expression, and peer comparison are carried out

TABLE 1: Conscious and unconscious contributions of each age group.

	High primary	Third junior	University	Middle age	Elderly
Consciousness contribution	0.569	0.625	0.584	0.387	0.273
Unconscious contribution	0.202	0.190	0.241	0.253	0.305

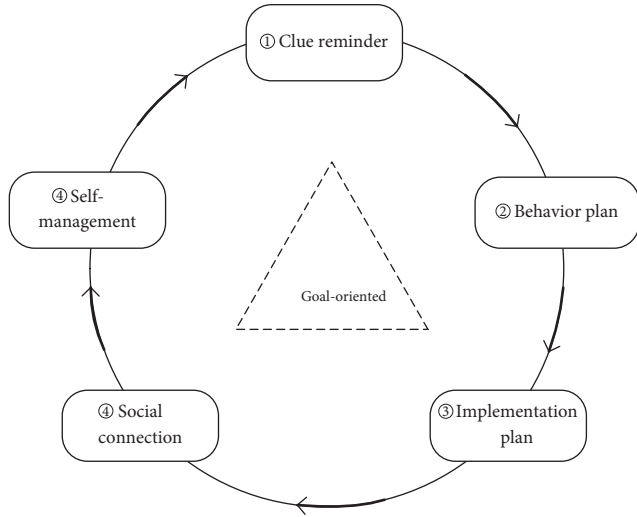


FIGURE 1: Persuasion behavior component structure.

- (5) Self-management: in order to conduct self-management scientifically and rationally, the user behavior execution process is managed based on monitoring, comparison and evaluation

In actual persuasion, the brain will take intuitive response, active psychological tendency, and mental cooperation evaluation to make decisions according to similar or unfamiliar scenes. The behavior threshold and trigger conditions of persuasion are different. Therefore, according to the size of motivation and ability, this paper combines them into four quadrants and divides persuasion behavior into three types of modes. These three types of persuasion modes all have the above five persuasion design components, but each has its own emphasis. Class A represents repetitive habitual behavior with high motivation and ability, which refers to the formed behavior. It focuses on the cues and stimuli of creating a behavior environment, including explicit things or scene cues (interface cues), implicit habits, or experience connections (cognitive cues). Class B represents the assisted autonomous behavior with a low factor in motivation and ability, which refers to changing and transforming behavior habits. It focuses on activating behavior parameters and reducing obstacles to user behavior with the help of visible and measurable goals and feasible path plans. Class C represents the heuristic induced behavior with low motivation and ability. It refers to creating or using the situation shared by some persuasion behavior with the help of narrative, metaphor, empathy, and other rhetorical communication means such as cognitive therapy, design behavior route in line with the user’s cognition, and gradually inducing the user.

4.3. Persuade Model Design. The persuasion context in the persuasion model includes intention (initiator of the intention to change behavior and attitude), event (clear the use context of persuasion technology, user context, and technical context), and strategy (information content, form, and dissemination path are accurately targeted to target users to achieve persuasion) aspects. Figure 2 is a schematic diagram of the persuasion model.

4.3.1. The Internal Function Stage of the Persuasion Model. Combining with the behavioral data processing and unconscious calculations mentioned above, the functional phase process inside the persuasion model is obtained. From data information input to persuasion information output, the entire functional stage is divided into three functional modules that affect the persuasion function: data information acquisition, data information transformation, and persuasion information transmission. The data information acquisition module is used to perceive the original data information and pass this information into the persuasion product, and then the data information conversion module will process the original data information into persuasive information that can be used to improve the user’s behavior motivation and behavior ability. Finally, the persuasion information transmission module transmits the converted persuasion information to the user. Figure 3 shows the internal functional phase process of the whole persuasion model.

Through the establishment of the functional modules of the above persuasion model, it can be seen that the persuasion model is divided into three functional modules: data information acquisition, data information transformation, and persuasion information transmission.

4.3.2. Persuasion Mechanism Design. The application of persuasion mechanism in various fields needs to be realized through design. According to the above analysis, the specific process of persuasion mechanism design is as follows:

- (1) Determine the target behavior. First, choose a simple and specific target behavior, and develop it into a large series of target behaviors step by step in a step-by-step manner.
- (2) Determine the user object. Must first choose a willing target user group, and then step by step to expand those who are not willing or have the willingness to oppose the boycott.
- (3) Analyze the reasons why users do not adopt the target behavior. Find out whether the reason for preventing user behavior is the lack of motivation or

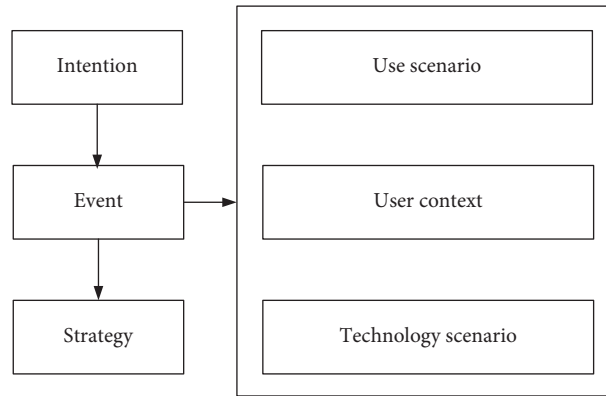


FIGURE 2: Schematic diagram of persuasion model.

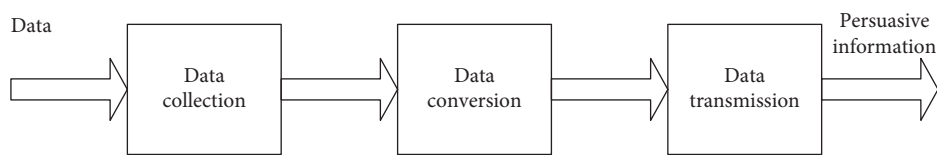


FIGURE 3: The internal function stage process of the persuasion model.

lack of ability. If both lack of motivation and lack of ability, they need to go back to the previous two steps to consider whether the previously determined target behavior and target user are appropriate.

- (4) Choose a persuasion mechanism or persuasion strategy that meets the application conditions. The choice of persuasion mechanism is mainly considered from three aspects: the target behavior, the target user, and the reasons for preventing the behavior from occurring.
- (5) Investigate the application cases of the persuasion mechanism. To determine whether the persuasion mechanism is appropriate, we need to find three cases with similar target behaviors, three cases with similar target users, and three cases with the same persuasion mechanism.
- (6) Follow successful cases. According to previous studies on the application cases of the persuasion mechanism, we can find more successful cases from similar cases to imitate. This imitation is not just a hard copy, but to discover the essence of its persuasive effect from successful cases.
- (7) Rapid iteration of prototype design. In persuasive design, the persuasion mechanism must be iterated quickly. With the development of related technologies, the persuasion mechanism must also be continuously developed. This is more important than deep thinking about how to persuade with the best mechanism.
- (8) Expand the trial scope to verify the effectiveness of the function. As mentioned earlier, a small and easy-to-achieve goal should be selected to determine the goal. With the success of the small goal, the scale needs to be expanded. After the effectiveness of the

persuasion mechanism is verified, a new target behavior can be established to achieve iterative and gradual development.

## 5. Application Case Analysis

In order to verify the effectiveness of the method in this paper, the following takes the field of shared electric vehicles as an example to further verify the feasibility of the method in this paper.

*5.1. Scenario Design and Research Purpose.* This paper attempts to introduce a persuasion mechanism to solve the problem of users' bad behavior. Therefore, after a systematic understanding of the persuasion mechanism, it analyzes the efforts of persuasion technology in the field of shared electric vehicles. Refining the application methods and modes of persuasive technology in the shared electric vehicle service system provides theoretical hypotheses and clearer research goals for further empirical research.

In recent years, the sharing economy of rent for sale mode has become more and more mature. The shared electric vehicle combined with the two has become a hot spot in the sharing field. Shared electric vehicles not only fill the gap in the field of public transportation but also make daily transportation more convenient and efficient and avoid environmental problems caused by exhaust emissions. In the long run, it provides a good scheme for the improvement of the energy crisis, air pollution, traffic congestion, and other problems. Even though electric shared vehicles have many advantages, they still encounter many obstacles in the early development. The main problem is that the vehicle body is damaged, the environment inside the vehicle becomes worse, the vehicle is parked disorderly, and even serious traffic accidents will

be caused by users' nonstandard operation. In order to make the healthy and sustainable development of shared electric vehicles, it is necessary to guide users' behavior to be more standardized, improve users' motivation and ability to complete behavior, and make them form good behavior habits so as to make shared electric vehicles better serve users. Therefore, in the case analysis, this paper uses persuasion technology to change users' behavior and attitude so as to guide and persuade users' behavior habits.

Through the investigation of users and their behaviors using shared electric vehicles, they can intuitively discover the users' bad behavior problems in the process of using shared electric vehicles and analyze the influencing factors of users' bad behaviors and attitudes. Accurately analyze the user's travel behavior path and key scenarios so as to obtain an opportunity for behavior persuasion. At the same time, on the basis of the original persuasive design, investigate whether the user's behavior is affected or changed and the user's recognition and trust in such behavior persuasion.

## 5.2. Basic Information of Survey Objects

*5.2.1. Target User Attributes.* Users of shared electric vehicles are the main research objects. It is necessary to study their age, gender, occupation, driving age, purpose, and other pieces of information, analyze the attributes of users in the field of shared electric vehicles, understand the background factors of users, and more accurately find their behavior path so as to guide the establishment of key scenes. Table 2 shows the relevant contents applied in the collection of basic information of survey objects.

The first part is the basic situation of shared electric vehicle users, collecting information on the user's age, gender, occupation, driving age, and whether there is a private car. Quantitatively study the characteristics of target users in the shared electric vehicle field, and collect data for the output of user models.

The second part is a study on the travel situation of shared electric vehicle users, which mainly includes the selected shared travel brand, the reason and purpose of choosing shared travel, and the frequency and duration of shared travel. The purpose of this part is to supplement the user model on the one hand and to make the behavior path for the subsequent on-site observation of users and on the other hand to analyze some of the reasons for the generation of user behavior.

The third part is a study on the behavioral cognition of users of shared electric vehicles, which mainly includes users' understanding and views on shared electric vehicles, the status of shared travel in the minds of users, overall feelings and difficulties encountered during use, and uncivilized and irregular behaviors that users have learned about themselves. On the one hand, this part studies the psychological attitude of users so as to see the implementation of behavior persuasion in sharing electric vehicles. On the other hand, they can also find out which factors may affect the behavior of shared electric vehicle users and the importance of these factors so as to conduct in-depth research on these factors in the next stage.

*5.2.2. Travel Situation of Users Using Shared Electric Vehicles.* The above is mainly to study the attributes of target users and then need to study and analyze the use of shared electric vehicles for such users to travel, which can provide directions for behavioral persuasion design. The content of the travel situation study includes the average number of users using a car per month and the average length of time each time the car is used. See Figures 4 and 5 for details.

Based on the above survey results, the effectiveness of this method is verified from the two aspects of behavior persuasion acceptance and persuasion satisfaction. In the verification, in order to highlight the advantages of this method, direct persuasion and impact persuasion are used as comparative methods to analyze the application effects of different persuasion methods.

## 5.3. Analysis of Experimental Results

*5.3.1. Satisfaction of the Persuaded.* Taking the satisfaction of the persuaded as the experimental index, the direct persuasion method, the impact persuasion method, and the method in this paper are compared. In the comparison process, 10 users were randomly selected, and the comparison was achieved through the form of scoring. The score interval is [0, 100]. The larger the value, the higher the satisfaction level. The results are shown in Table 3.

By analyzing the data in Table 3, it can be seen that, in the scores given by 10 users, the satisfaction of this method is higher than that of the direct persuasion method and impact persuasion method. Among them, user 4 gave the highest score of 97.1 for the method of this paper, while the highest scores for the direct persuasion method and impact persuasion method were 81.7 and 85.1, respectively, which were significantly lower than this method. It shows that users can better accept the persuasion mechanism designed by this method, and satisfaction can reflect users' executive power. The higher the satisfaction, the stronger the users' executive power and the better the persuasion effect. Therefore, it can be seen that the application effect of this method is better.

*5.3.2. Acceptance of Behavioral Persuasion.* Taking the acceptance of behavioral persuasion as the experimental index, the direct persuasion method, the impact persuasion method, and the method in this paper are compared, and the results are shown in Figure 6. Among them, the acceptance of behavior persuasion is represented by data, specifically 0.1–1.0. The higher the value, the higher the acceptance.

Analysis of Figure 6 shows that, with the increase in the number of iterations, the acceptance of behavioral persuasion of different methods has shown a continuous downward trend. The change trend is more obvious than the method in this paper. At the same time, analyzing the results of the acceptance of behavioral persuasion shows that the method in this paper is significantly greater than the direct persuasion method and the impact persuasion method, which shows that the method of this paper is more effective.

TABLE 2: Basic information collection form of survey objects.

Basic situation	Age, gender, occupation, driving experience, and ownership of a private car
Travel situation	The selected shared travel brand The reason and purpose for choosing shared travel Shared travel frequency and duration
Behavioral awareness	Degree of connection and perception of shared electric vehicles Share the status that appears in the minds of users General feelings and difficulties encountered during use Uncivilized and irregular behavior that users have learned about themselves

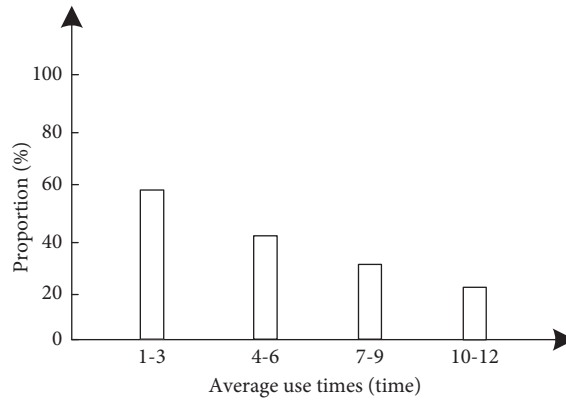


FIGURE 4: Average number of users using a car per month.

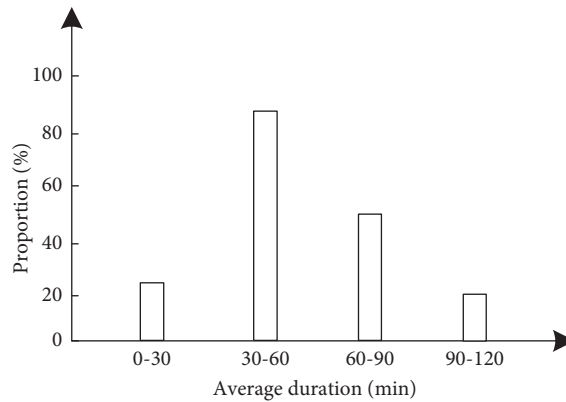


FIGURE 5: The average car usage time each time.

TABLE 3: Comparison results of persuaded persons' satisfaction.

User	Method of this paper	Direct persuasion	Impact persuasion
1	94.3	78.4	82.5
2	95.6	77.1	83.6
3	92.0	75.3	85.1
4	97.1	76.2	84.7
5	93.3	75.0	79.8
6	96.0	79.4	78.9
7	94.2	80.1	76.3
8	95.7	81.7	78.4
9	91.7	80.9	78.0
10	93.4	79.9	79.0

5.3.3. *Persuasion Duration.* Taking the persuasion duration as the experimental index, the direct diarrhea persuasion method, the impact persuasion method, and the method in

this paper are compared. The results are shown in Figure 7. Among them, the persuasion time is recorded through the clock. The higher the value, the longer the persuasion time.



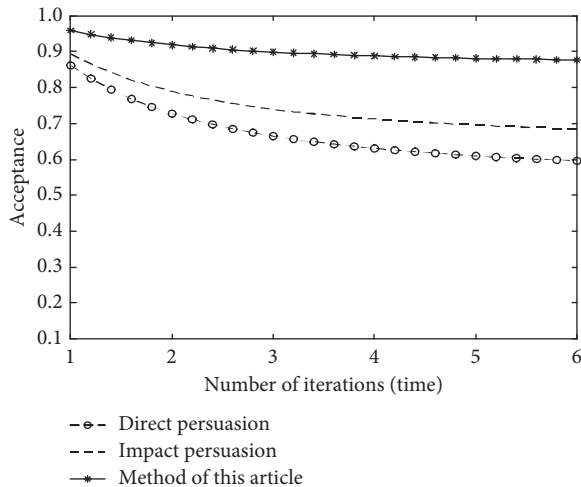


FIGURE 6: Comparison results of acceptance of behavioral persuasion.

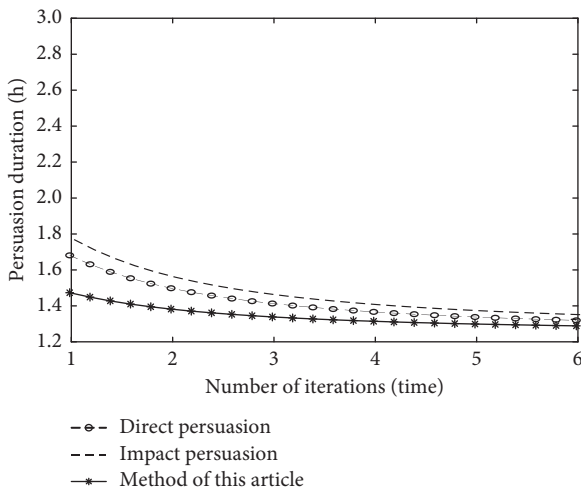


FIGURE 7: Comparison results of persuasion duration.

According to the analysis of Figure 7, the persuasion duration of different methods shows a continuous downward trend with the increase of the number of iterations. Among them, the persuasion duration of this method is less than 1.5 h, while the persuasion duration of the direct persuasion method and impact persuasion method is higher than that of this method, up to 1.8 h and 1.7 h. At the same time, by analyzing the persuasion time, it can be seen that the persuasion efficiency of this method is significantly higher than that of the direct diarrhea persuasion method and impact persuasion method, which shows that this method is more effective.

## 6. Conclusion

For the purpose of improving the acceptance of behavioral persuasion, an analysis method of persuasion design mechanism based on unconscious calculation is proposed. Taking the concept of persuasion and the goal of persuasion as the theoretical basis, the analysis of the experimental

results shows that the method in this paper has a higher acceptance of behavioral persuasion and can obtain a higher satisfaction from the persuaded, which fully validates the advantages of the method in this paper.

## Data Availability

The raw data supporting the conclusions of this article will be made available by the authors without undue reservation.

## Conflicts of Interest

The authors declare that they have no conflicts of interest regarding this work.

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