RESEARCH ON PRAGMATIC CHARACTERISTICS AND COMMUNICATION STRATEGIES OF CHINESE LANGUAGE PHILOLOGY

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ABSTRACT

In this paper, we first analyze the discourse features in social and cultural contexts, and from the perspective of discourse output, we establish a model of maximizing the expectation of context and discourse choice by estimating the parameters of context, and explore the problem of contextual formalization as well as the influence of the time factor on the discourse features. Then the Hidden Markov Chain was adopted to consider the time factor and establish the corpus derivation relationship. The communication subject, communication content, technique and communication object are taken as the main factors, and the Chinese language communication strategy is constructed by combining the theory of pragmatics. In the final analysis, it is found that the cumulative number of learners is the largest in the US region, and the model only needs about 25 rounds of iterative training at the optimal running time. In the factor analysis, webpage has the highest factor loading value of 0.846 in Factor 4, indicating that it plays an important role in Chinese language text dissemination. The proposed model develops a more targeted and effective communication strategy, which can improve the communication effect of Chinese language and promote cultural exchange and understanding.

KEYWORDS

Context parameters; Markov chain; pragmatics theory; iterative training; factor loadings

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1. INTRODUCTION

The Chinese language and script is one of the ancient languages and scripts, and it is constantly revitalized following the past [1]. With the continuous promotion of the Belt and Road Initiative, China's discourse in the international community has been enhanced, and international trade and exchanges are increasing. In this context, the dissemination of Chinese language and script is particularly important [2]. Through the use of Internet platforms and new media and other channels, the dissemination of Chinese language and literature is expanded, so that more groups can understand Chinese culture and the connotation of Chinese language and writing, etc., and enhance the national cultural soft power [3]. With the continuous development and improvement of information technology, people's lifestyles and language habits are gradually changing, and the dissemination of Chinese language and literature is in a fragmented and fast-food environment [4]. The dissemination of Chinese language text with the help of network information carries a certain degree of fragmentation, and it is difficult to achieve a lasting effect in a relatively short period of time [5]. At the same time, as the dissemination of text is mostly replaced by the Internet, computer and cell phone input methods have brought writing convenience to people, and people's awareness of the writing standard of Chinese characters is relatively weak, and they often have the dilemma of forgetting the characters when they put pen to paper, or make frequent mistakes when writing [6].

Since existing studies have not proposed specific strategies for Chinese language text communication, this paper starts from the dimensions of social context and cultural context to reveal the pragmatic laws of Chinese language in social and cultural contexts. A theoretical framework for the computation of Chinese language communication is constructed, which includes the establishment of a model for maximizing the expectation of context and discourse choice, an in-depth discussion of the contextual formalization problem and the time factor, and an analysis of the computational pragmatics model of the corpus. In the establishment of the context and discourse choice expectation maximization model, the mathematical model of expectation maximization choice is derived by combining a large amount of corpus analysis. Meanwhile, when considering the issue of contextual formalization and the time factor, the formalization method and the time series analysis are adopted to comprehensively grasp the changes of discourse features in different contexts and time, providing a systematic research framework for the development of more specific and effective communication strategies.

2. LITERATURE REVIEW

Boal-San Miguel, I et al. examined the siting patterns of the Spanish CCI sector through a spatio-temporal perspective using micro-geographic data in the context of the increasing spatial distribution of the cultural and creative industries, emphasizing the impact of policy in terms of resource accountability and institutional coordination [7]. Harsch, S et al. suggested that due to language barriers, differences in cultural

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preferences, and differences in health literacy levels that providing healthcare to migrants and refugees faces difficulties. In order to improve this situation, the role of health literacy in second language programs was explored in depth in the CURA project, funded by the German Federal Ministry of Education and Research, which proposed interventions to facilitate its implementation [8]. Kessler, M et al. conducted a pre-writing discussion through verbal and text chats followed by a timed writing task with 10 university Chinese language learners. Students engaged in discussions for longer durations and rounds during the face-to-face program, and the FTF program led to an increase in lexical complexity and syntactic richness [9]. Wei, L et al. analyzed how multilingual Chinese language users incorporate new digital communication platforms through a long-term, ongoing digital ethnographic study of online communication and creative Chinese characters in the global Chinese diaspora. Utilizing the functionality of Chinese character writing systems to challenge dominant linguistic ideologies and policies and to express new transnational consciousnesses can facilitate cultural mobility and social participation on a global scale [10]. Wang, D identifies discrepancies between prescribed monolingual principles and perceived linguistic realities of translation from a socio-cultural perspective in the context of the gradual decline of language learning. It is recommended that foreign language programs in higher education revisit their monolingual ideology and consider adopting a translanguaging pedagogy to better attract and retain students [11].

Guo, Q et al. identified research trajectories targeting language learners and their language development across a variety of topics such as reading, pronunciation, task motivation and engagement, story retelling, group cohesion, and classroom management, affirming the scholarship of communication language teachers [12]. Pinto, R. D et al. explored whether the use of gaming strategies in virtual reality facilitates the acquisition of a second, i.e. foreign, language. The study found that learning was the most assessed dependent variable in the selected recordings, and augmented reality was the most used technology, suggesting that these technologies should be used to support second language learning rather than replacing traditional methods altogether [13]. Machwate, S et al. emphasized the benefits of student mobility in terms of enhancing communication skills, with a particular focus on foreign language learning and behavioral attitude development. The benefits of integrating virtual experiences from a mobility perspective are explored by using some elements of 21st century knowledge as a tool for developing intercultural, linguistic and digital competence [14]. Canals, L suggests the role of multimodality and translanguaging as underpinnings of spoken interactions, with the identification and transcription of language-related events, and quantitative and qualitative analyses of the data, including all translanguaging and the the use of multiple modes of meaning generation, revealing the interaction between multimodality and learners' multilingual replicas [15]. Kubota, R et al. explored the main goal of foreign language education, which is to develop learners' ability to communicate in a foreign language. The meaning of communicative competence becomes complex in the current neoliberal context of the importance of communication in the knowledge economy. The analysis

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reveals the paradoxical nature of neoliberal communicative competence, which both conflates global communication with the use of four measurable English language skills to convey information and challenges linguistic norms by emphasizing multilingualism and co-constructed interactional competence [16].

3. PRAGMATIC FEATURES OF CHINESE LANGUAGE AND LITERATURE

3.1. PRAGMATIC FEATURES IN SOCIAL CONTEXTS

Language activities are inseparable from the context, any kind of language activities are carried out in a specific context, and thus this language activity will be engraved with the color of a specific language, and influenced and constrained by this context [17]. The concept of context is very broad and covers a wide range. Context in a narrow sense refers to the context of language, and context in a broad sense refers to the communicative situation, objective conditions and background of language. Speech activities are always in a certain space and time, unfolding in a specific situation and between specific people [18]. The features of pragmatics in social context are shown in Fig. 1, context and language activity are inseparable, and context is the basis and prerequisite for understanding language activity. Social context involves the psychology, cognition and specific social and cultural environments of the communicating parties, and is also affected by factors such as age, social distance, social status and value orientation of the parties [19]. The Chinese language is also situated in its own social context, and is subject to the constraints and limitations of cultural, historical, religious, and socio-psychological factors in the social context.

Figure 1. Characterization of discourse in social contexts

3.2. PRAGMATIC FEATURES IN CULTURAL CONTEXTS

Chinese is a high-context language that is highly dependent on the environment, and the cultural context is summarized as the environment in which the discourse is produced, which can also be said to be the verbal and non-verbal contexts [20]. Figure 2 shows the features of discourse in cultural context, the former refers to the front and back of the written language or the front and back of the oral

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communication, while the latter refers to the specific environment when the language is expressed, such as the time, place, weather, body movements or the social environment such as the cultural background involved in the written expression [21]. It can be seen that the extension of the concept of context is relatively broad, then, from the point of view of literalism, the cultural context is more by virtue of the literary text in the textbook, that is, the written language. Therefore, it only includes contextual context and socio-cultural context, which are summarized as intra-linguistic context and extra-linguistic context. Intra-linguistic context refers to the linguistic environment that can be directly understood through the language in the text, and extra-linguistic context is the cultural environment of the times that influences the author's thoughts at the time of creation outside the language [22].

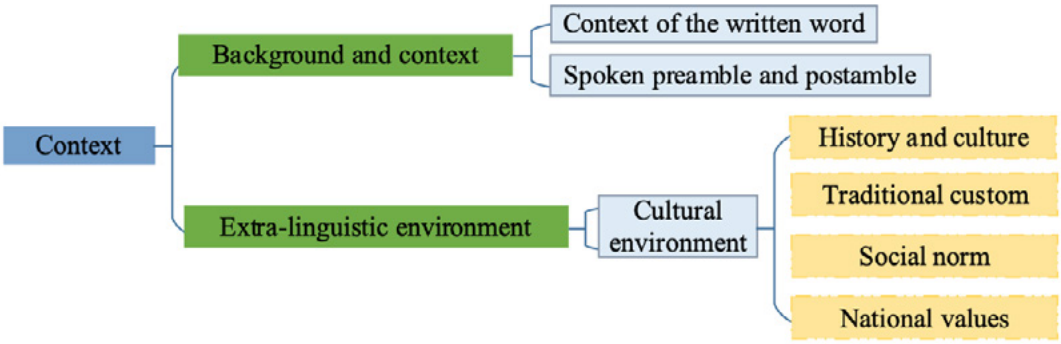

Figure 2. Characteristics of discourse in cultural contexts

4. CONSTRUCTING CHINESE LANGUAGE COMMUNICATION CALCULATIONS BASED ON PRAGMATICS THEORY

4.1. CONTEXT AND DISCOURSE CHOICE EXPECTATION MAXIMIZATION MODELING

From the perspective of discourse output, it is believed that using language is choosing language, and the task of discourse depiction and discourse interpretation lies mainly in the study of contextual conformity, structural conformity, dynamic conformity, and the degree of awareness of conformity [23]. The entry point chosen for modeling is dynamic conformity, i.e., discourse is accomplished in the dynamic process of specific contexts. Since contextual changes affect the linguistic forms chosen by the communicating parties, and the linguistic choices of the parties generate new contexts, context and discourse influence and interact with each other in a dynamic process.

Let the context x obey $N(\mu_x, \sigma_x^2)$, and the model parameters θ are vectors, including each statistic constructed according to the influencing factors of the context. It builds an expectation-maximizing context estimation model for the dynamic compliance process based on linguistic compliance theory and expectation-maximization

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algorithm: the input of the whole model includes four parts: the selected discourse *D*, the context *C*, the joint distribution of discourse and context under the given parameter conditions $P(D, C \mid \theta)$, and the conditional distribution of context under the given parameter and discourse conditions $P(D, C \mid \theta)$, and the output is the model parameters θ. The model first chooses an initial value of θ_0 for the parameter and starts iterating, producing an estimate for θ at each iteration, denoted θ_i, where i is the number of rounds of iteration. At the $i+1$th iteration, the expectation is computed:

$$Q\left(\theta, \theta_i\right) = E_C\left[\log P(D, C \mid \theta) \mid D', \theta_i\right] = \sum_C \log P(D, C \mid \theta) P\left(C \mid D, \theta_i\right) \quad (1)$$

Then the parameter θ, which makes Eq. (1) maximized, determines the estimate of the parameter for the $i+1$ nd iteration θ_{i+1}:

$$\theta_{i+1} = \arg\max_{\theta} Q\left(\theta, \theta_i\right) \quad (2)$$

The process of Eq. (1) and Eq. (2) is repeated continuously until convergence, so that the context parameters can be approximated and thus the discourse can be judged to belong to which context distribution [24].

4.2. DISCUSSION OF CONTEXTUAL FORMALIZATION ISSUES AND TIME FACTORS

In order to reflect the dynamics of the model, it is also necessary to take the time factor into account, adding the stochastic process model that fits the nature of compliance is an effective method.

1. The complexity of the context and the formalization of ideas, the current difficulties in the application of the model lies in the formal description of the discourse and the context, here you can refer to the relevant theories in formal pragmatics. In addition, two ideas about the description of context and discourse can be referred to here. First, consider the factors affecting the context as variables, and because of too many influencing factors you can set the number of variables to be infinite, and build the model through limit theory or infinite series. The second is not to consider each factor affecting the context, but to abstract the common characteristics of each factor and build the model in the way of structure and variety, similar to the construction of group, ring and domain in abstract algebra.

2. If we consider the time factor in the interaction process between the two parties using the discourse, the model can be constructed by using the Hidden Markov Chain. In this case, the state sequence of the potential Markov chain is the context state $C_1, C_2, \ldots$, which is unobservable, while the observation value is the discourse $D_1, D_2, \ldots$ obtained after selection, and its transfer probability at the *n* rd state is:

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$$P\{D_n = d \mid C_1, D_1, \cdots, C_{n-1}, D_{n-1}, C_n = C\} = p(d \mid c) \qquad (3)$$

The choice of discourse at a given moment is only relevant to the current context, and the effects of the previous moment's state on the present can all be regarded as part of the context in the current state, so that the memorylessness of the Hidden Markov Chain can be satisfied.

4.3. COMPUTATIONAL PRAGMATICS MODELING ANALYSIS OF THE CORPUS

The initial context of the whole corpus is C_1, C_2, C_3, in which, in order to fully indicate the learner's identity, the customer chooses the questioning mode with markers in the alternatives to convey the implicit meaning. To make context $C = [C_1, C_2, C_3]^T$, Chinese communication needs to consider the current context that can maximize the indication of one's own identity and generate the corresponding discourse, generating discourse $S1$, and the corpus derivation is shown in Fig. 3. In receiving $S1$, a cognitive model is formed to analyze the concepts and their more fixed connections with each other, which is then integrated into an abstract, unified and idealized perfect structure. Intrinsic cognition of the discourse $S1$ is formed through the intermediate process of organizing concepts to understanding the expressed meaning. At the same time, according to the external context C_1, C_2, C_3 and other social and cultural influences. The antecedent nodes of nodes such as C_1, C_2, C_3 are omitted here, and the antecedent can be understood as the possible values set by each node, whose conditional probability table reflects the size of the probability of taking each value. In this example C_1, C_2, C_3 is fixed, thus omitting its antecedent nodes.

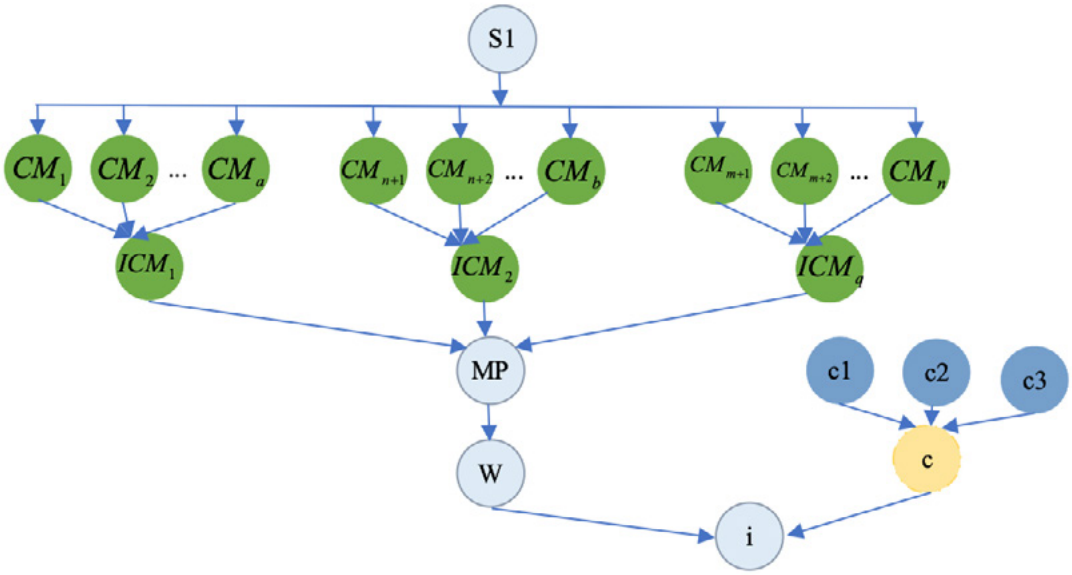

Figure 3. Relationships inferred from the corpus

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In the propagation process of Chinese characters, node i is obtained and merged into the new propagation strategy, at which time some parameters in the model vector need to be adjusted, viz:

$$\theta_{i+1} = \arg\max_{\theta} E_C\left[\log P(S1 \mid C \mid \theta) \mid S1', \theta_i\right] \quad (4)$$

The process of Eq. (4) is illustrated in Fig. 4, where the updated propagation parameters dynamically add the literal and implied meanings of $S1$ to the corresponding positions, or adjust the original strategy parameters. When the propagation strategy is updated, the implicit meaning that the Chinese language text wants to indicate has been clarified.

5. CHINESE LANGUAGE COMMUNICATION MODELING

Chinese language and text audiences are complex and varied, and are affected by a variety of factors, which are the result of a combination of factors. Audiences in different fields are affected by different factors. Communication subject, communication content and skills and communication object are the main factors affecting the communication effect, but the quantification of these factors is affected by many other complex and small factors, which work together to affect the communication effect. Chinese language communication influencing factors are shown in Figure 4, specifically including:

1. Activity is one of the influencing factors of Chinese language communication, indicating the importance of the communication object to this event. Therefore, in the first-level factor communication effectiveness, the audience's attention to the Chinese language text active degree becomes one of its second-level factors, including attention, participation and attention time of the three third-level factors.

2. Site contribution is the degree of influence of the Chinese language communication platform on the effectiveness of communication, Chinese language and literature through the network platform to disseminate information, in the first level of communication effectiveness, the communication platform that the site contribution to become one of the second level of influence of the Chinese language communication, including microblogging platforms, community platforms, web page news platforms, WeChat platforms and search engine platforms of the five third-level elements.

3. Communication mode, i.e., the communication skill or strategy of Chinese language and script, is divided into two kinds, namely, borrowing momentum and creating momentum. The momentum for the combination of the current hot topics to plan the language text, to attract the attention of the audience. The momentum building is to attract the audience's attention through creative ideas

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or influential opinions in Chinese language text. Momentum is the spontaneous dissemination of screen names, and momentum building is the promotion of human beings. Therefore, in the first level of communication effectiveness, the communication strategy adopted by Chinese language text in communication also becomes one of the second level factors, including two third level factors of borrowing momentum and creating momentum.

4. The communication trend factor can also be regarded as a risk control factor. There are many uncontrollable factors in the communication process, so we should be well prepared to control the communication trend of the Chinese language, and once negative voices appear, they should be dissolved in time, so as not to aggravate the situation. Therefore, in the first-level elements of communication effectiveness, communication trends on the Chinese language and script to become one of the second-level factors, including the control of word-of-mouth towards and control of word-of-mouth continuation of the two third-level elements [25].

5. The cost of communication is one of the most important factors considered at the beginning of the enterprise planning activities, so the cost is an important factor affecting the effectiveness of investment.

6. Nowadays, communication media are blossoming, and traditional media include newspapers, magazines, radio and television. New media include online new media, mobile new media, digital new media. If Chinese language and script want to expand their influence, penetration into other media is an effective communication method. In addition, free media coverage saves a lot of investment costs for dissemination. Therefore, whether or not Chinese language text causes media penetration is also an influencing factor of communication effectiveness.

7. Whether or not the Chinese language text is effective in communication is best evidenced by the sales of neighboring products or the rate of language usage.

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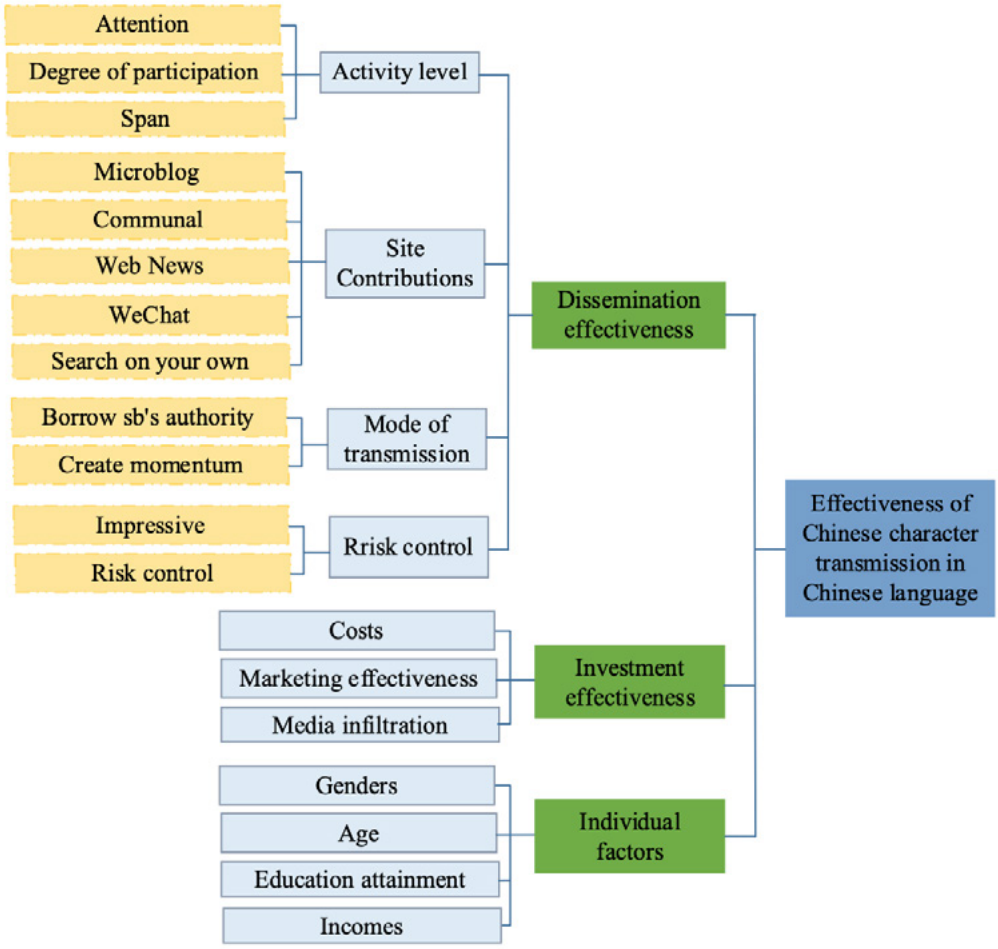

Figure 4. Factors affecting the effectiveness of Chinese language communication

6. EMPIRICAL ANALYSIS OF PRAGMATIC FEATURES AND COMMUNICATION STRATEGIES OF TEXTUAL STUDIES

6.1. BACKGROUND CONDITIONS

This section is based on the pragmatic features of Chinese language literature and the designed communication model based on pragmatics theory for validation, including three aspects:

1. The main consideration of this empirical evidence is that real-life Chinese language text usually fails to resonate at first when it is disseminated, and it needs to reach a certain level of dissemination before it may be noticed and learned. Therefore, the later the time in the communication strategy, the easier it is to realize. And the activity level is usually the earlier the intervention, the better, will explore the reasonable time to put the strategy.

2. The estimation of the number of dissemination nodes is mainly to explore what percentage of the minimum placement can get relatively good results. In reality,

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if we want to carry out Chinese language and text communication strategy placement, the larger the audience will inevitably invest more, so the number of communication nodes is a very important aspect of communication strategy.

3. On the basis of determining the time of strategy placement and the proportion of the number of communication nodes, the effects of different strategies are examined through batch validation to illustrate the advantages of communication based on the theory of pragmatics.

6.2. EFFECTIVENESS OF DISSEMINATION

Under the same communication strategy, Figure 5 shows the number of new Chinese learners and the cumulative number of learners in different regions. Figure 5(a) shows the new Chinese learning tasks in different regions, and the number of new learners peaks between 900-1500 hours, with the largest peak of new learners in the Iranian region and the smallest in the Korean region. Figure 5(b) shows the cumulative number of learners in different regions, and the number of learners peaked between 3300-4400 hours, with the earliest peak time reached in the Italian region and the latest peak time in the Korean region. The largest cumulative number of learners is in the U.S. region, and the smallest is in the Korean region. The earliest maximum number of learners is in the Italian region and the latest is in the US region.

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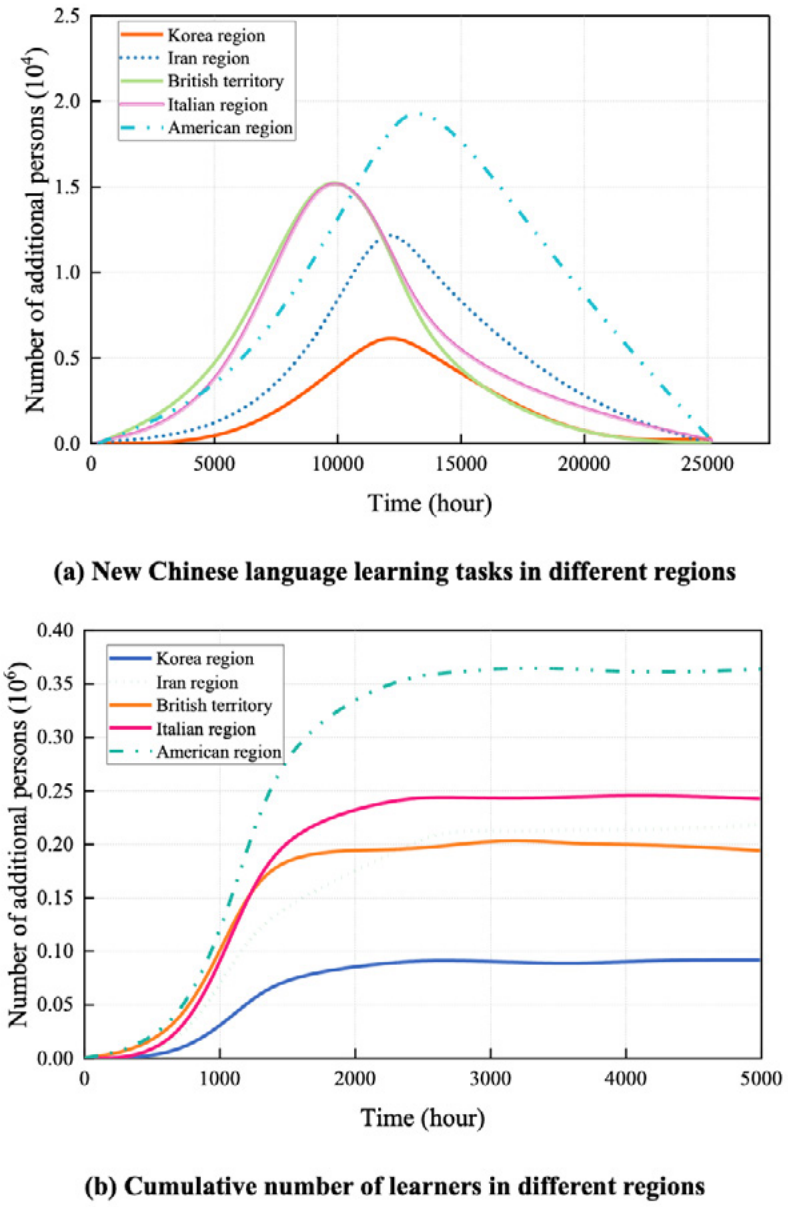

Figure 5. New and Cumulative Number of Chinese Language Learners in Different Regions

6.3. PROPAGATION ALGORITHM PERFORMANCE ANALYSIS

In order to prove that the Chinese language communication strategies constructed based on pragmatics theory have better performance, this paper conducts four groups of comparison experiments. The first two groups adopt the pragmatics theory and no theory approach respectively, randomly initialize the model parameters and train the strategy network from the initial state. The latter two groups adopt pragmatics theory and theory-free approach respectively, but first iteratively train 40 rounds of pre-training on a small-scale two-layer network, and then migrate the model to a large-scale four-layer network for training, corresponding to the Pre-Pragmatics theory and theory-free approach in the figure, respectively, and the results of the comparison of pre-training convergence rate are shown in Fig. 6. It is found that the pragmatics theory can better support pre-training, and the pre-training effect and model migration

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ability are better than the no-theory method, and the migrated -pragmatics theory has a better training starting point, and convergence to the optimal running time only requires about 25 rounds of iterative training, but the no-theory method still requires about 35 rounds of selective generation training. Meanwhile, in terms of convergence rate, the pragmatics theory is also slightly higher than the no-theory approach.

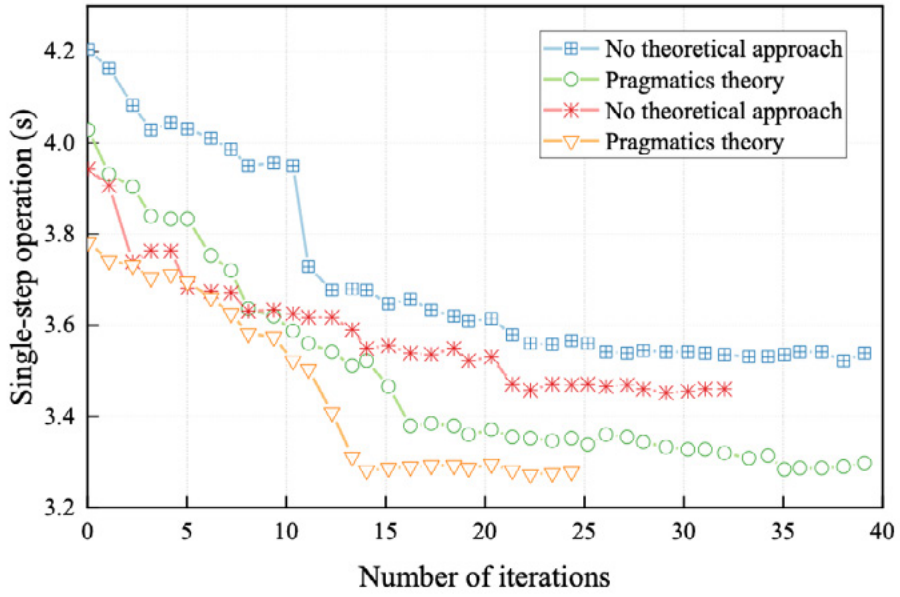

Figure 6. Convergence rate of pre-training with and without the theory of pragmatics

In order to prove the rationality and effectiveness of the proposed method, this paper compares the designed discourse-based model, the multimedia model and the web-based communication model respectively. Table 1 shows the results of comparing the average performance of propagation. For the average value of coverage obtained from 10 operations of the three propagation models, the multimedia model is 85.4%, which is 1.2% lower than the average value of the network propagation model, and 14.06% lower than the average coverage value of the discourse-based theory, which can be seen that the multimedia model has the highest coverage rate. For the running time, the multimedia and network propagation models have a certain arithmetic complexity, so their average arithmetic time is longer than that of the pragmatics theory by 75 s and 22.34 s. For the number of iterations, the average number of iterations of the pragmatics theory is the lowest, which is only 13.6, and the speed of convergence is significantly improved compared with the other two models. In conclusion, the communication model based on pragmatics theory constructed in this paper can improve the performance of Chinese language text communication.

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Table 1. Comparison of average propagation performance

Number of promotions	Multimedia model			Network communication			Pragmatics theory		
	Site covera ge	Running time/s	Number of iterations	Site covera ge	Running time/s	Number of iterations	Site coverage	Running time/s	Number of iterations
2	85.6%	126.1	62	87.2%	80.2	76	99.4%	32.2	11
4	84.2%	98.6	63	88.6%	81.5	62	99.7%	24.0	21
6	86.1%	101.2	55	86.1%	76.2	57	99.4%	26.4	16
8	86.4%	96.6	54	86.4%	66.5	54	99.3%	30.9	12
10	84.7%	94.2	55	84.7%	100.6	58	99.5%	28.2	8
Average value	85.4%	103.34	57.8	86.6%	81.0	61.4	99.46%	28.34	13.6

In this paper, the data on the factors influencing the effectiveness of online event marketing communication converged after 10 iterations, and the factor loading matrix is shown in Table 2. Categorized into four different common factors, the factor loading data ranged from 0.4 to 0.9, indicating that the factor has a certain degree of construct validity. Factor 1 includes a total of five elements from the hypothesized model: the cost savings factor in investment effectiveness, the traditional media coverage factor, the acceptance of the product factor, the control of word-of-mouth going factor in communication effectiveness, and the control of word-of-mouth continuation. The highest factor loading value of 0.766 indicates that controlling the direction of IWOM is strongly related to IWOM management or control strategies. Factor 2 consists of the four sub-items in the hypothesized model of self-search, community, time of attention, and momentum building together to form the factor. Community has the highest factor loading value in Factor 2 at 0.762. Meaning that community has a high weight in Factor 2 and is strongly correlated with some kind of community-related factor. Factor 3 includes three sub-items of microblogging, positivity, and lending as constituent factors, and Factor 4 consists of three sub-items of webpage, microblogging, and attention in the hypothetical model. Webpage has the highest factor loading value in Factor 4, which is 0.846. It indicates that webpage has a higher weight in Factor 4, which suggests that webpage plays an important role in Chinese language and text communication.

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Table 2. Factor loading matrix

	Ingredient			
	1	2	3	4
Controlling the direction of word-of-mouth	766	110	166	192
Peripheral Products	667	276	391	84
Cost saving	681	-44	144	832
Traditional strategy	664	66	198	366
Search on your own	22	485	154	318
Communal	189	762	196	78
Focus time	445	689	131	63
Create momentum	166	498	777	214
Microblog	413	445	521	31
Degree of participation	91	101	462	0
Borrow sb's authority	322	468	542	26
Web page	321	298	42	846
WeChat	192	140	53	628
Attention	189	169	539	698

7. CONCLUSION

In this paper, based on the pragmatic features in social and cultural contexts, we constructed a model of Chinese language text dissemination based on pragmatics theory and obtained the following conclusions:

1. The number of new learners after applying the constructed model peaks between 900-1500 hours of learning, with the highest peak in the Iranian region and the lowest in the Korean region. The cumulative number of learners peaked between 3300-4400 hours, with the earliest peak in the Italian region and the latest in the Korean region. It helps to gain a deeper understanding of the impact of geographical differences on learning behavior and provides an empirical basis for the allocation of educational resources in the relevant regions.

2. The migrated pragmatics theory has a better training starting point and only requires about 25 rounds of iterative training at the optimal running time, which is more efficient compared to about 35 rounds of iterative training for the no-

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theory approach. It is expected to promote the improvement of language learning and reduce the cost of learning time.

3. The pragmatics theory performs optimally in terms of coverage, and the average number of iterations of the pragmatics theory is the lowest, which is only 13.6, indicating that the pragmatics theory is able to more comprehensively consider the situations and contexts of language use, and improves the sensitivity to the features of language use.

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