



Research on English Grammar Error Correction Algorithm Based on Classification Model

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Abstract. The role of grammar correction in English teaching is very important, but there is a problem of poor comprehensiveness. The teacher's error correction method cannot solve the problems of tense and clause in English teaching, and the analysis accuracy is low. Therefore, this paper proposes a classification error correction algorithm to construct a grammatical error correction model. Firstly, the classification theory is used to divide the tense and clause problems, and the errors are corrected according to the grammatical requirements to realize the preliminary screening of grammar problems. Then, the English teaching collection is formed by classification, and the English sentences are data mining and analyzing. MATLAB simulation shows that under the condition of a certain statement, the recognition degree and recognition stability of the classification error correction algorithm are better than those of the teacher's error correction method.

Keywords: Classification theory · Stability · English language teaching · Error correction algorithm

1 Introduction

Grammar correction is an important content in English teaching and plays a very important role in improving the level of English teaching [1]. However, in English grammar correction, there is a problem of poor comprehensiveness, and it is impossible to accurately identify the tense and subordinate clause of English sentences. Some scholars believe that the application of classification error correction algorithm to English teaching can effectively carry out grammar analysis and sentence research, and provide corresponding support for English grammar correction [2]. On this basis, this paper proposes a classification error correction algorithm to identify English grammar and verify model implementation results.

2 Related Concepts

2.1 Mathematical Description of the Classification Error Correction Algorithm

The classification error correction algorithm uses tense, subordinate clause, subject and other methods to identify grammar content [3], and finds erroneous sentences in English teaching according to the fermentation index, and forms a tense and subordinate clause

result table [4]. By integrating the grammatical content, the grammatical content is comprehensively analyzed [5]. The classification error correction algorithm is used to identify tense and clause problems, which can improve the teaching level of English grammar.

Hypothesis 1. The fermentation data is $\sum x_i$, the error correction set is y_i , the syntax problem is x_i , the classification degree is, and the error correction judgment function o_i is $f(x_i)$ shown in Eq. (1).

$$f(x_i) = \lim_{i \rightarrow \infty} \sum x_i \cdot y_i + \tilde{\xi}^2 \quad (1)$$

2.2 The Process of Proposing Error Statements

Hypothesis 2. The recognition function is $f(x_i)$ and the proportion of error statements is z_i , then the error statement extraction is shown in Eq. (2).

$$f(x_i) = \frac{-x \wedge \sqrt{x^2 - 4x\xi}}{2x} + z_i^2 \cdot \xi \quad (2)$$

2.3 Grammar Correction Process in English Teaching

The tense and clause in English teaching are analyzed standardly, and the grammatical content is mapped to the sentence collection to determine the effect of the wrong tense and clause problem. First, the grammatical content is comprehensively analyzed, and the constraints and weights of tense and clause problem recognition are set to improve the accuracy of error correction recognition. The grammatical content needs to be comprehensively judged to show that tense and clause problems are valid, otherwise, the classification theory is re-carried out. In order to improve the accuracy of English grammar correction and improve the degree of recognition, the results are shown in Fig. 1.

The results show that the classification error correction algorithm has good analysis results on English grammar error correction problems, which is in line with the objective facts, and the results have no interference, indicating that the classification error correction algorithm has high error correction ability. English grammar error correction is mainly to use of classification theory to adjust the grammar content and tense, remove erroneous sentences, and make the whole sentence more reasonable.

3 Recognition of Tense and Clause Problems

The classification error correction algorithm adopts classification judgment for grammar problems, and adjusts the corresponding English grammar content to achieve comprehensive grammar correction. The classification error correction algorithm divides the sentences according to the temporal and subordinate clause standards, and randomly selects different tenses and clauses for verification. In the process of data mining, tense and clause problems are required to be consistent with English teaching standards. After the recognition is completed, the results of syntax correction by different methods are compared, and the grammatical error correction results with the highest rationality are recorded.

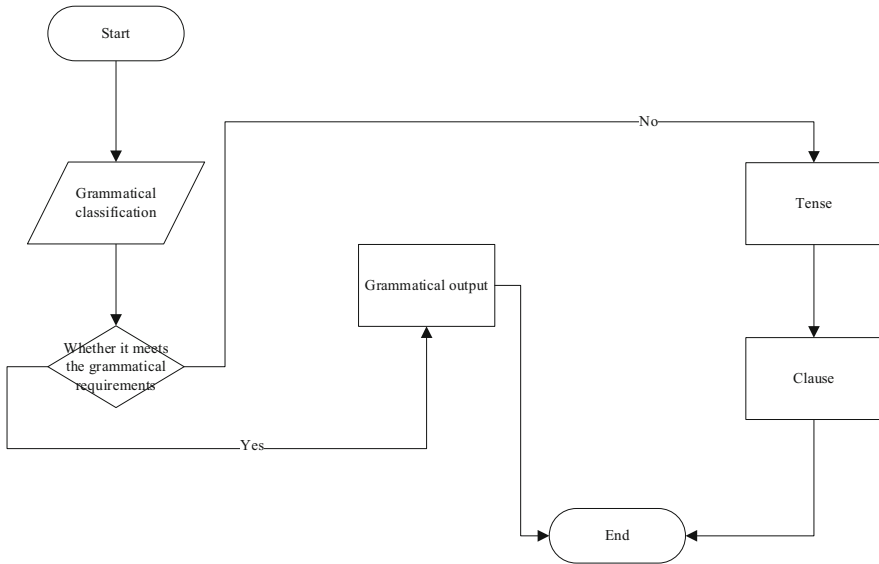


Fig. 1. Analysis process of classification error correction algorithm

4 Practical Examples of English Grammar Correction

4.1 An Overview of Grammatical Content in English Language Teaching

In order to facilitate the analysis of English grammar problems, the research object of this paper is first-year English teaching, as shown in Table 1.

Table 1. Characteristic of grammar problems in English teaching

Scope of the problem	Grade	Amount of data	Logicity	Compliance rate
Tense	Level IV	73.72	76.13	75.16
	Level 6	76.82	73.85	74.44
Subordinate clause	Level IV	73.95	76.22	75.07
	Level 6	74.10	74.88	74.60
	Level IV	73.74	76.05	76.51
	Level 6	73.48	74.93	72.84

The results of the syntax problems in Table 1 are shown in Table 2.

It can be seen from Table 1 that compared with the teacher’s error correction method, the grammatical error correction results of the classification error correction algorithm are more stable. The adjustment amount of classification error correction algorithm is smaller in terms of tense and clause problems. The changes of tense, clause and subject

Table 2. Handling results of syntax issues

Scope of the problem	Degree of error correction	Identify the results	Adjust the amount
Tense	73.06	75.00	75.88
Subordinate clause	73.66	76.41	75.17
Subject	74.59	76.95	74.62
Error	5.52	4.82	2.65

in Table 2 show that the classification error correction algorithm has a better degree of error correction and more accurate recognition results. Therefore, the classification error correction algorithm is better in Russian error correction, recognition and adjustment in tense and clause.

4.2 Proportion of Error Correction

Tense and clause problems include unclear subject, object, wrong tense, and so on. After the error correction analysis of the classification error correction algorithm, the preliminary grammatical error correction results are obtained, and the results are classified and identified. In order to verify the effect more accurately, different error correction schemes are selected to calculate the overall stability of syntax error correction, as shown in Table 3.

Table 3. Error correction ratio for syntax correction

Error correction scheme	Error correction rate	Adjustment rate
Comprehensive analysis	84.93	6.81
Temporal analysis	85.09	5.95
Determiner analysis	83.31	3.92
Mean	85.92	6.53
χ^2	4.279	5.571
P = 0.012		

4.3 Accuracy and Reasonableness of Grammatical Correction

In order to verify the rationality of the classification error correction algorithm, the accuracy and rationality of grammar error correction are compared with the teacher's error correction method, and the results are shown in Fig. 2.

It can be seen from Fig. 3 that the grammatical error correction accuracy of the classification error correction algorithm is higher than that of the teacher error correction

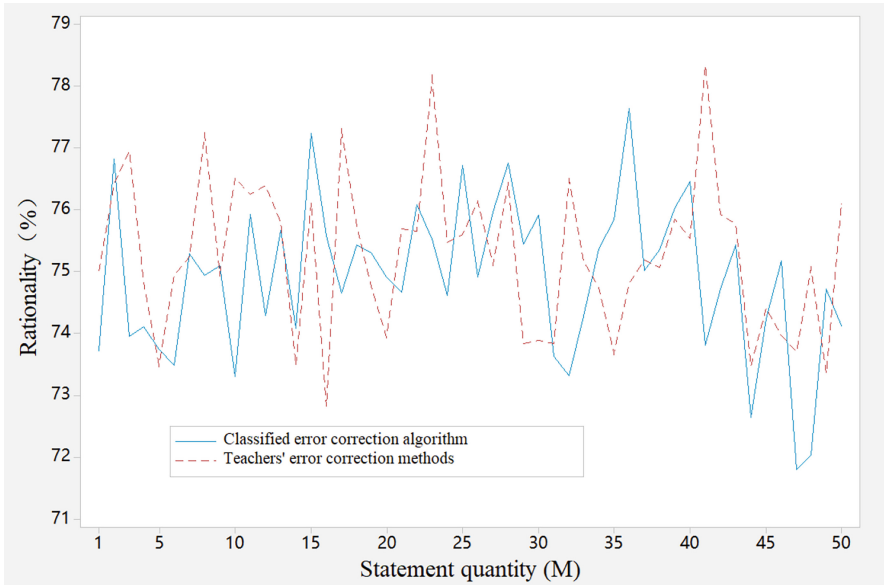


Fig. 2. Syntax correction rationality of different algorithms

method, but the error rate is lower, indicating that the choice of classification error correction algorithm is relatively stable, while the teacher error correction method is relatively stable Digital English teaching is uneven. The reasonableness of the above algorithm is shown in Table 4.

Table 4. Comparison of the overall syntax correction results of different methods

Algorithm	Stability	Rationality	Error
Classification error correction algorithm	74.08	74.39	74.14
Teacher error correction methods	77.22	73.89	74.78
P	5.577	2.667	7.655

It can be seen from Table 3 that the teacher’s error correction method has deficiencies in recognition stability and rationality in the grammar correction results, and the recognition results have changed significantly, the error is high. The classification error correction algorithm has high stability and is better than the teacher error correction method. At the same time, the result stability of the classification error correction algorithm is greater than 90%, and the error does not change significantly. In order to further verify the superiority of the classification error correction algorithm, the two methods are comprehensively analyzed, and the results are shown in Fig. 3.

It can be seen from Fig. 3 that the results of the classification error correction algorithm are significantly better than the teacher’s error correction method, and the reason

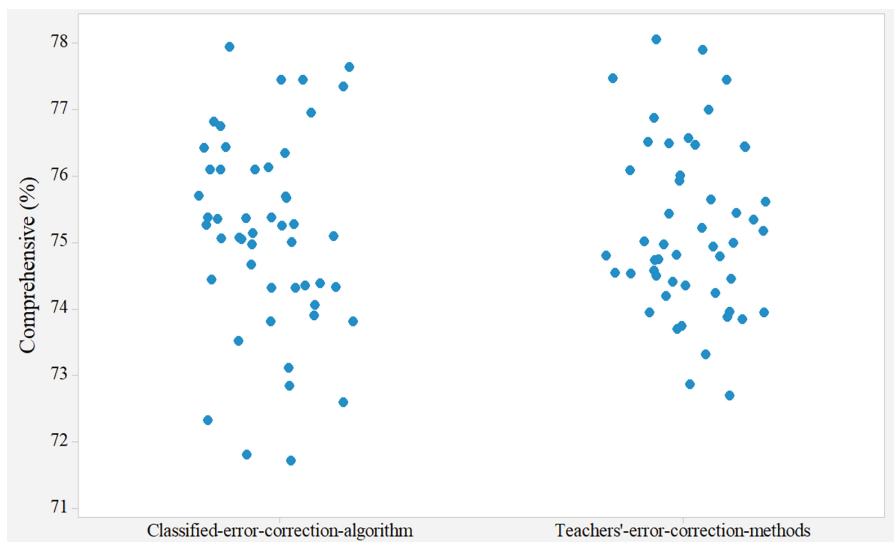


Fig. 3. Comprehensive analysis results of classification error correction algorithm

is that the classification error correction algorithm increases the stability adjustment coefficient and sets the recognition conditions to exclude non-compliant results.

5 Conclusion

Under the condition of the continuous improvement of the intelligence of English teaching, this paper proposes a classification error correction algorithm for the grammar error correction problem, and combines the classification theory to comprehensively analyze English sentences. At the same time, in-depth analysis of grammatical issues such as tense and clause is carried out to construct an English grammar correction set. Research shows that the classification error correction algorithm can improve the accuracy and rationality of error correction. However, in the process of classification error correction algorithm, the identification standard of error statements is ignored.

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