

## Original Paper

# A Study on the Translation and Communication Effect of Lu Yao's English Version of *Life* Based on Sentiment Analysis

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### Abstract

*This paper makes an emotional analysis of readers' comments on the English version of Life by Lu Yao on Amazon. The research shows that western readers generally have a high degree of acceptance of the unique regional culture of China conveyed in the English version of Life, but they hold negative criticism on the translation of some words. The main reason for readers' criticism is that the translation does not faithfully convey the original information. Examining the translation and dissemination effects of foreign-translated works from the perspective of readers' comments is helpful to accurately find out the translation problems existing in foreign-translated literary works and provide reference for the translation and dissemination of literary works in the future.*

### Keywords

*text sentiment analysis, Life, Lu Yao, translation*

## I. Introduction

At present, it is an important strategy for China to spread Chinese culture worldwide and the translation and dissemination in China's literary works deserve serious study. As a well-known Shaanxi native writer, Lu Yao's works have strong Shaanxi cultural characteristics. His book *World of Plainness* has won the third Mao Dun Literature Prize in China. Mao Dun Literature Award is one of the literary awards sponsored by the Chinese Writers Association and with the highest honor in China, which shows the representative position of Lu Yao.

The translation and introduction of Lu Yao's works to the western world, to a certain extent, represents the external spread of Shaanxi literature and Shaanxi culture. What's more, words and expressions in Lu Yao's works are one of the important carriers to show Shaanxi culture. Studying their translation and dissemination can examine the translation and dissemination effect of Shaanxi regional culture from one side, which has a positive effect on Lu Yao's works, Shaanxi culture and Chinese culture going abroad.

Amazon is the largest e-commerce platform in the United States. Many foreign-translated books will be put on amazon.com, and readers' ratings and comments on books have become an important reference index for judging the effect of foreign-translated books. By investigating readers' comments on amazon.com, we find that among the English versions of Lu Yao's novels published in recent years, *Life*, published by Amazon Crossing Publishing House and translated by *Chloe Estep*, has 100 English comments, which is the most commented one among all the English versions of Lu Yao's novels. It can be said that as one of the English versions of Lu Yao's novels, *Life* has received the highest attention from western readers and has important research value. In this paper, the emotional analysis tool will be used to make emotional judgment and quantitative analysis on the key evaluation sentences in Amazon website readers' comments, and with the help of specific numerical values, the translation and communication effects of the words in the English version of *Life* are investigated.

## 2. An Overview of Text Sentiment Analysis

Text sentiment analysis refers to the judgment of emotional polarity and the analysis of emotional intensity of subjective text with emotional color, which is one of the most important branches in the field of natural language processing. Emotional analysis of text, also known as tendentiousness analysis, emotion mining, subjective analysis or comment mining, is a process of analyzing, processing, inducing and reasoning the content of emotional comment text, so as to find out the attitude and opinions of commentators on the research object. Comment text information expresses various emotional colors and tendencies of users, such as joy, anger, sadness, approval, opposition, praise and criticism. Sentiment analysis can be applied to market forecasting, public opinion monitoring, competitive intelligence acquisition and other research.

The methods of sentiment analysis include sentiment dictionary-based method, supervised machine learning method and unsupervised machine learning method. The method of emotion analysis based on emotion dictionary is to construct a dictionary containing all kinds of emotions, formulate evaluation rules, split sentences, analyze and match the dictionary, calculate the emotion value by analyzing the number of positive and negative emotion words in the text, so as to get the proportion of positive, negative and neutral emotions in each sentence, and finally use the emotion value as the basis for judging the emotional tendency of text comment data. The method of machine learning needs a large number of manually labeled corpus as a training set, and uses machine learning or algorithms to train the model, and then the model is used to classify and judge the emotional tendency of the new article.

Usually, we will use the method based on emotional dictionary to analyze, and build emotional dictionaries and self-built dictionaries in corresponding fields according to specific research objects in different fields, that is, synonymous extensions of specific subject words are added to the dictionaries. Common basic emotional dictionaries are: an emotional dictionary published by hownet, including Chinese emotional dictionary and English emotional dictionary; NTUSD, the dictionary of emotional polarity of National Taiwan University, includes 2810 positive words and 8276 negative words with high

accuracy; Tsinghua University Li Jun Chinese dictionary of commendatory and derogatory meanings; Dalian University of Technology's Chinese emotional vocabulary ontology library and other public dictionary resources.

After constructing the emotion dictionary, segmenting and cleaning the text data, a document-phrases matrix is formed. Then it is necessary to calculate the emotional score of text comments. We match each text with a positive and negative emotional lexicon, with the weight of positive words being +1 and the weight of negative words being -1. Then we classify and combine each text according to the ID of each comment to calculate the final emotional tendency score, and combine the two matrices to get a matrix of document-phrases-emotional value, so that we can define the emotional tendency of text comments-positive, neutral or negative evaluation according to the emotional score.

### 3. The Positive Value of Sentiment Analysis Technology in Studying the Communication of Literary Works

At present, Python is the most commonly used tool for emotional analysis, especially in the study of the communication effect of China's translated literature. Python has many advantages: simple grammar, more suitable for beginners; all contents are open source and free, and can be directly downloaded, installed and used; there are rich third-party databases, which can realize many powerful functions; it can be applied to a variety of operating systems.

As one of the important ways to judge the extent of the globalization of Chinese culture, we can directly quantify the acceptance of overseas readers to China's literary works and China's culture by crawling overseas readers' comments on China's books translated abroad on Amazon on a large scale. If we subdivide the field and start from a small point, we can also use the same method to investigate the translation and communication effect of English translation of national texts with China characteristics. The research results will help to find out the problems existing in the translation of culture-loaded words and other words, so as to extract common difficulties, and then make targeted analysis and correction, in order to promote the success of foreign translation of literary works in the future.

At present, relevant achievements have attracted attention. Zhang Lu (pp. 80-86) made an emotional analysis of readers' comments on the English version of *Three-body* on Amazon. From the reader's point of view, he compared the acceptance of different translators' versions of *Three-body* overseas. Shi Chun Jean and Deng Lin (pp. 91-96) took readers' comments on the Amazon website of Mo Yan's eleven English versions as the text corpus, sorted out the emotional attitudes of overseas readers towards the main features of Mo Yan's novels with the help of emotional analysis technology, and made a judgment on the acceptance of Mo Yan's novels overseas. It can be said that sentiment analysis plays a positive role in the study of foreign translation and dissemination of China's literary works.

#### 4. Research Design

The specific research ideas can be divided into the following steps: using crawler tools (also called Web Spider) to obtain the required comment data from the website, cleaning and preprocessing the text data (including deleting unnecessary fields, selecting appropriate word segmentation tools to segment the text, removing stop words, etc.), building a complete emotional dictionary, and judging, extracting and analyzing emotional information. In terms of expansion, it is to extract the unit elements with tendentiousness characteristics from the cleaned comment text according to certain rules, and match them with the establishment of a complete emotional dictionary to calculate the emotional comprehensive value of each comment, so as to classify the emotional tendency.

##### 4.1 Collecting and Preprocessing of Target Corpus

First of all, although the target of crawling is all the readers' comments of *Life* on Amazon, it is also worth noting that in addition to the content of the review itself, other ancillary information is also very important, including the theme of the review, which often represents the core emotional orientation of the review content and the reader's rating of the book, which is of great reference value. Secondly, select the field you want to crawl. The area where the corresponding field is located is selected by using the Web Scraper crawler tool, so that the system can turn pages circularly to realize automatic crawling, and the crawled content is stored in the form of a table. We finally got a total of 100 valid readers' comments on *Life*. For the crawled content, we need to do some simple processing: adjust the order of the fields. After adjusting the 100 comments according to the order of user ID, rating star, comment topic, comment time and comment text content, we save them as an .xlsx table file for subsequent retrieval. The processed result is shown in the following Figure 1.

	A	B	C	D	
1	ID	Score	Title	Time	Review
2	"Dr. Z" Richard Zeile	5.0 颗星	A Moving Portrait of S	2021年3月26日	I listened to the reading of Robert Wu of the translation by Chloe Estep on a Brilliance Audio compact disc
3	Kindle/Audible Customer	4.0 颗星	I've not much sympathy	2020年4月23日	SPOILERS... This was a really interesting story. I like the fact that it's not a cradle to grave account. You an
4	twistally	4.0 颗星	Chinese novela	2023年3月6日	A Chinese authored book translated by an American. I read and saw the village and city. I thought of old vs
5	Nate K	5.0 颗星	compelling read with b	2023年1月29日	I found this to be a wonderful easy reading book. The story is relatable on a fundamental level, timeless. He
6	M. Bruce	5.0 颗星	Like Emerson or Wenc	2020年5月23日	Life is the late Lu Yao's first book and the first English translation of this giant of Chinese literature. The nc
7	Martina A. Nicolls	4.0 颗星	A delightful story	2019年8月15日	The novel set in rural China at the beginning of the 1980s. Gao Jialin has a major decision to make when hi
8	AGM	5.0 颗星	Beautiful!	2022年12月18日	Lu Yao takes you to rural China and builds characters that steal your heart! Complex yet simple. Life is stil
9	Kermit	4.0 颗星	Fun and insightful	2021年1月15日	It was a fun story with some good plot twists I didn't expect. Lu Yao did a good job of drawing you into the
10	DA	5.0 颗星	Peasant, Scholar, youn	2021年9月12日	Born a peasant but really a true scholar. We meet a young Chinese who has the enviable position of teach
11	dragonfly74	5.0 颗星	Beautiful and unpredi	2022年10月9日	Even when is framed in a particular context, it is quite easy be related with the ups and down of life, the pr
12	F. perez	4.0 颗星	Recommended reading	2021年2月4日	This book is true to its title. Life presents us with gifts. What we do with them will determine our future. I
13	Kathy in Virginia	4.0 颗星	TEACH!	2020年4月23日	I learned a lot about life in Communist China reading this book. I can't say I sympathize with this young m
14	Patti D	5.0 颗星	Life	2022年9月26日	Thank you for such a great read. The messages that are given for life go along way. I truly love it!
15	Pat Sands	5.0 颗星	A hard life	2020年4月25日	I've had the privilege to visit China so this was ideal to read. I have a beautiful, sweet precious young gran
16	Anne B	4.0 颗星	An intriguing look at c	2020年7月1日	Gao Jialin is an intellectual young man teaching in rural communist China. The area has a very rigid social
17	kebbie	5.0 颗星	Hated to see it end	2020年12月8日	The opening sentence in the Foreword observes that China as reflected in this book is the China of the early
18	manusiri kanchanachaya	4.0 颗星	Novel about selfishnes	2022年2月20日	It reminds us that people sometimes overlook their true love. Good translation.
19	Tom abides	4.0 颗星	A great glimpse of Chi	2020年4月24日	Really enjoyed Life! As one who has never been to the far East I got a good idea of what life must be like t
20	Joella T.	4.0 颗星	Life	2021年1月15日	I like to read translated works because I like to get a glimpse of other cultures from the perspective of an in
21	CLB	2.0 颗星	I tried.	2022年9月12日	I wanted to like this book. Some parts in the beginning were interesting and I learned a little about Chinese

Figure 1. Stored Related Data

After crawling down the target data, it is necessary to clean and preprocess the data, including deleting duplicates, keeping only valid data, removing comments without rating and comments and links with advertising nature, and at the same time, it is necessary to pay attention to removing numbers, special characters and some null text.

Followed by word segmentation (also called tokenization), is a kind of operation, which cuts the text into a string sequence (its elements are generally called token or words) according to specific requirements. For western inflectional texts, there are explicit signs such as spaces between words to indicate the boundaries of words, but some fixed collocations still need to be regarded as a word; However, for many isolated languages and cohesive languages (such as Chinese, Japanese, Vietnamese, Tibetan, etc.), there are no spaces between words, so automatic word segmentation has become the primary basic work faced by computers when dealing with isolated languages and cohesive Chinese texts. There are many methods of word segmentation, such as word segmentation based on dictionary, word segmentation based on statistics and word segmentation based on grammar rules, etc. The common word segmentation tools are JieBa, SnowNLP and ROSTCM.

After text segmentation, “stop words” should be removed. Stop words, mainly refers to prepositions, pronouns, conjunctions, articles, function words and other words without emotional color and value tendency. Because these words are of little value to the analysis of text connotation, we generally need to use the text excluding stop words for further study. We can make appropriate additions or deletions according to specific topics with the help of the online public stoplist, so as to eliminate invalid words to the maximum extent, make the analysis process more efficient and the results more robust.

#### 4.2 Key Text Extraction and Emotional Analysis

In order to understand the translation and communication effect of *Life*, it is necessary to extract subjective evaluation sentences that can reflect readers’ emotional attitude towards the book from readers’ comments, but there is a problem that these sentences with subjective feelings are not necessarily related to the translation quality, readability, translation and communication effect and cultural exchange degree we want to study, so in order to facilitate a more granular analysis, we can select some words as anchor words. Based on the method of extracting the anchor word by thesaurus (according to the theory of distributive semantics, words appearing in the same context are similar in meaning), the words similar to the anchor word in contextual meaning are extracted first, and then locate the sentences in which these words are located. According to these evaluation sentences, readers’ evaluation attitude towards the translation of the book is inferred at a macro level. In addition, we can also use the word frequency statistics method to select the corresponding anchor words (the result is Figure 2, the more frequently the words appear in comments, the bigger they look in the Word Cloud Map), select the words with high frequency and great relevance to the research topic, and judge the emotional polarity of their sentences, and the final results are more intuitive and reliable.



Figure 2. Comment-generated Word Cloud Map

In the specific operation, this study sets the anchor words to be extracted into three groups: namely, the words “translation”, “language” and “word” which reflect the evaluation of translation level and word selection; words “China”, “Chinese” and “culture” reflecting the degree of acceptance of Chinese culture; and the words “book”, “read” and “story” which reflect readers’ reading experience and story evaluation. After we classify the extracted comment sentences into text files, we use Python to load the TextBlob toolkit, and use NaiveBayesAnalyzer sentiment classifier to analyze the sentiment of the extracted comment sentences. The research shows that NaiveBayesAnalyzer’s emotion classification can be based on machine learning model, and it can be trained by film review texts, which has high accuracy (Loria WEB) in dealing with short review texts. NaiveBayesAnalyzer will make a probability judgment on the emotional polarity implied in the tested sentence, and will give the probability values of positive and negative emotions expressed in the current sentence respectively. Positive emotions will tend to 1, negative emotions will tend to -1, and neutral emotions will approach 0. The greater the probability value of an emotional polarity, the stronger the emotional polarity is in the sentence. After emotional analysis of all the comments, we summarize the data and results of emotional analysis to provide quantitative data support for the follow-up discussion.

## 5. Empirical Research Based on Emotional Analysis

After emotional analysis of the extracted evaluation sentences, the average probability of emotional polarity of the evaluation sentences in which three groups of 9 keywords are located is shown in the following Figure 3 to Figure 5:

Sentence Type/Emotional Polarity Probability Mean	translation	word	language
Positive Emotional Probability Mean	0.186	0.100	0.338
Negative Emotional Probability Mean	-0.135	-0.192	/

	translation	word	language
Number of Positive Sentence	5	1	2
Number of Negative Sentence	5	2	0

**Figure 3. Emotional Polarity Data of Sentences Containing “translation”, “word”, “language”**

According to the results of emotional analysis, readers’ evaluation of translation tends to be polarized in the sentences where the words “translation”, “language” and “word” are located, and nearly half of the readers think the translation is great, although half of the readers still have negative comments on translation. However, in terms of the average emotional probability, the average positive emotional probability of the sentence where “translation” is located is 0.051 points greater than the average negative emotional probability. In addition, the number of evaluation sentences about “word” selection and “language” quality is too small, with a total of 8 sentences, of which 3 are positive emotions, 2 are negative emotions, and 3 are neutral emotions, so they are not displayed in the table.

Sentence Type/Emotional Polarity Probability Mean	China	Chinese	culture
Positive Emotional Probability Mean	0.313	0.157	0.303
Negative Emotional Probability Mean	-0.050	-0.092	-0.094

	China	Chinese	culture
Number of Positive Sentence	24	17	10
Number of Negative Sentence	1	4	2

**Figure 4. Emotional Polarity Data of Sentences Containing “China”, “Chinese”, “culture”**

With regard to culture of China and China, the sentences in which the words “China”, “Chinese” and “culture” are located all show a positive emotional attitude on the whole, and almost all the evaluation sentences with “China” and “culture” as key words show a high positive emotional probability value. Therefore, We can make a preliminary judgment that readers can actively accept and identify with the cultural information conveyed in the English version of *Life*, and are willing to perceive and understand Chinese culture, so as to enhance their understanding of China.

Sentence Type/Emotional Polarity Probability Mean	book	read	story
Positive Emotional Probability Mean	0.339	0.367	0.330
Negative Emotional Probability Mean	-0.170	-0.180	-0.294

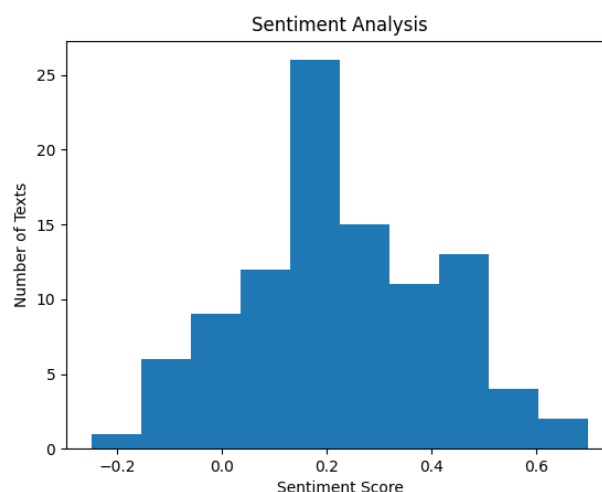
  

	book	read	story
Number of Positive Sentence	41	47	42
Number of Negative Sentence	11	7	14

**Figure 5. Emotional Polarity Data of Sentences Containing “book”, “read”, “story”**

The most frequently mentioned in readers’ comments is about the reading experience of the book as a whole and the experience of the story. The sentences in which “book”, “read” and “story” are located all show a very high average positive emotional probability. In particular, it should be pointed out that the average positive emotional probability of the sentence in which “read” is located is the highest among the sentences in which nine words are located, reaching 0.367 points, indicating that overseas readers generally have a good sense of reading experience of this book, so they have left a deep and positive impression.





**Figure 6. Emotional Polarity Distribution of All Comment Sentences**

We can see from Figure 6 that the emotional values of most sentences are greater than 0, indicating that most readers have a positive attitude towards *Life*. Generally speaking, from the emotional attitude of relevant readers' comments, the Chinese-English translation of *Life* has played a good communication effect, that is, it has fulfilled the function of reflecting regional culture in English translation, and the target readers are willing to accept the Shaanxi culture shown in the English translation of *Life*. However, there are still some inappropriate English translations, which affect the reading experience of some readers.

## 6. Conclusion

Through the online collection and emotional analysis of readers' comments on the English version of *Life* on Amazon platform, it can be preliminarily judged that the overall translation effect and communication effect of the English version of *Life* are great, effectively conveying Shaanxi culture, but some sentences' translation also cause reading obstacles for readers, which makes readers less receptive to the English version of *Life*. There are two reasons for this: One is that the translator's translation methods of the same kind of English translation are not uniform, and the other is that the translator does not understand the source text, which leads to mistranslation.

This study also shows that the application of sentiment analysis technology to analyze the online comments of western readers can accurately find out the acceptance of a China literary work by western readers in a point-to-point way and the detailed reasons. In the future study of literary translation, we should expand the application scope of sentiment analysis technology in literary translation and communication analysis, so as to help more Chinese literary works go to the world more effectively.

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