Google-Translate-Combined Emotion Analysis in Translating Literary Works: Comparison of Two Chinese Versions of *David Copperfield*

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Abstract: Emotion, the root of literature, can never be ignored as a key factor in literature translation, yet studies on it are still rare till now. Reasons may vary, among which one might be that emotions of different languages seem impossible to compare for the different degrees or standards of measuring them in different cultures. This study intends to investigate the possibility of emotion transfer in translations. Specifically, it examines to what extent and how emotions in the original can be transferred into the translations, combining the machine translation, by comparing two Chinese versions of *David Copperfield*, as well as the machine translation of the two Chinese versions with the original. The results indicate that emotions can flow from the source to the target language, and their representations are closely related to the translators' desire to have their versions be adequate to the source or acceptable to the target culture.

Keywords: Emotional analysis, Google Translate, adequacy, acceptability, translational unit

1.   Introduction

There is no common agreement on what emotion really is Izard (2010). Stemming from the French word *émouvoir*, which means "to stir up", emotion, referring to the bodily stirrings accompanying mental feelings, from the 18th century has long been adopted as a catch-all term for feelings, passions, sentiments and affects (Dixon 2012). From its etymology, it can be seen that emotion is closely related to human behavior, though it might happen inside the human "heart", as it is an immediate reaction to a certain event. Essentialists believe emotions and their expression are an inborn as part of the inherited qualities of human beings (Darwin 2009: 351); yet for sociologists, emotions are aroused and managed in social intercourses. They are not limited to the face-to-face interaction, but refer to the process of all-level social systems (Longo 2020: 4). Contemporary emotion scientists describe emotion as a composition of "neural circuits that are at least partially dedicated, response systems and a feeling state/process that motivates and organizes cognition and action" (Izard 2010: 367). Therefore, it is not easy to give a quick definition of emotion.

However, a lack of consensus among the literature should not stop us from providing for the research a working definition that represents the meaning of this notion. In consideration of its source and nature, we define emotion as an umbrella term that covers all kinds of affects and feelings that mirror people's emotional experiences in real life. Based on the definition, emotional analysis also includes sentiment analysis in the following.

Then a question emerges: How can a person react to another person through the latter's writing instead of face-to-face interaction? Cognitive scientists have proved that in direct communication, speakers and listeners' brains exhibit joint, temporally coupled, response patterns, and the more correlated the brain-to-brain coupling, the more successful the communication is. In other words, the listeners' brain activity mirrors that of the speakers

which precedes, and the neuron coupling emerges when a successful communication is going on (Stephens, Silbert, and Hasson 2010; Liu et al. 2017). In this sense, people are more likely to effuse their empathy towards those they are talking with. Then what if people are reading literary works, as literature is regarded as "the home territory of emotion", able to reproduce and elicit emotions (Longo 2020: 66)? Philosophers of the west in ancient times have noticed the relationship between emotions and literature, like Plato, who believed poetry was dangerous as it could stir passions, and Aristotle, who regarded art as mimesis of life that had a possibility to move the audience (Holland 2004: 395).

In reading, people are confronted with a "silent" author, who just watches without any direct communication with them. In this case the readers have no access to the author's "real intent", but their heart can be "stirred up", to a greater or lesser degree, which is decided by their own understanding of the text. Even when aware of the fictional features of the literature, people cannot prevent themselves from being involved emotionally in those fictional characters and events (Radford 1977: 211).

However, those emotional reactions are not real but made emotions, which are "quasi-emotions" elicited by the faked reality of the fictional world. As quasi-emotions are the response towards the people, the events, or the situations in literary field, they might change or even distort the real ones that happen in people's real life. Notwithstanding that the emotions themselves really emerge, though they are of "make-believe" type that should be distinguished from the real ones (Longo 2020: 67), they are real emotions towards unreal literary works.

In this regard when the so-called make-believe emotions are aroused in readers' mind, they can at the same time decide whether or not they believe such emotions. For example, they might be frightened by a terrifying event in the novel, but they can also decide to not be afraid of it since the event is not real. Therefore, emotions which emerge from reading literature, though named the same as the real ones, can be consciously controlled by the human mind.

When it comes to translation, a translator must initially be a reader. How does a translator get to know the writer, since both come from different countries, with no sharing of the same cultural or linguistic traditions? Especially in literature and its translation, how do translators as readers understand the author before they translate the works into another language? Maybe one of the answers is their emotional reactions, as literature is regarded as the "philosophy of emotion", and emotion as the "root of literature" (Yin 2013: 59). Authors must have different emotions towards the characters in their works; as Dickens wrote in the preface to the 1867 edition to *David Copperfield* he loved all characters he created in his works, but there is, in his heart, "a favorite child, and his name is David Copperfield."

In reaction to the author's emotions, translators as readers need to decide what emotions might have been represented in the works, and then what means they might choose to manifest the emotions in their translation. Emotions in literary translations are not aroused but reasoned by translators. To this point, translators can never reach the adequacy of the original in expression of emotions, as they try to rationalize the emotions created by the author. Be that as it may, they might reach the acceptability of the translations in the target language if they can make a full play of "make-believe" emotions in translation according to the target culture and social norms.

2.   The Concept of "the Translator Behavior Criticism"

"Translator behavior" is not a new term, which took its first appearance in Wilss' *Knowledge and Skills in Translator Behavior*, in which he referred it to "translator performance", a fluctuated variable that was caused by "relativity" and "uncertainty" (Wilss 1996: 7). According to him, from an empirical point of view, translators, with knowledge and skills, can understand and reproduce various elements in the texts of the original. Though he put the goal of Translation Studies (TS) as "to describe and explain the behavior of the translator" (ibid., p. 11), he believed knowledge and skill were the main issues that would influence the translator's behavior. In other words, he talked more about the characterization of translator behavior instead of what translators really do in the translation procedures. He also took both the source-text and target-text environments as important factors that determined translator behavior (ibid., p. 14). Yet he held that "the main task of translation is to establish correspondence between the ST and TT", in which he emphasized more the ST author's intentions than the translation produced according to the TT readers' expectations; thus, the acceptability was least considered. Thus, it may seem safe to conclude he studied translator behavior within the scope of the ST and its underlying norms (ibid., p. 41).

It may be interesting to note that Toury did not take translator behavior into his consideration when he emphasized "translational behavior", trying to find the relationship between the key notion of "norms" and translational behavior, and "making some generalizations" with regard to it (Toury 2012: 20). He preferred the exploration and explanation of translation behavior within the target-oriented framework, in which he put forward two terms as the "value" behind translation: adequacy and acceptability. According to him, when an "assumed" translation is under study, there are "two principles whose realizations are interwoven in an almost inseparable way". On the one hand, a text produced in a particular language is designed to hold a position in this culture as a host one, i.e., the principle of "acceptability" in the target culture. On the other hand, the produced text can represent one that already exists in some other language or culture, and this one is also holding a definite position in this culture, which is regarded "adequacy" to the original (Toury 2012: 69).

If we take Toury's idea in a brief way, any translations must be a blending of the two principles. When approaching the "adequacy", the translation must distance the "acceptability". If going nearer the other, the translation is then going farther away from this one. Therefore, no translations can be totally adequate to the assumed original nor completely acceptable in the target culture.

Regarding translation criticism, Wilss mentioned the action of translation critics, who, he thought, could say at their will they might agree or disagree with a translation, but no objective evaluation criteria were ever established (Wilss 1996: 8). According to him, the role of critics was taken as evaluators with an individual point of view, which had nothing to do with an objective description of the translation itself. On the other hand, Toury did not consider assessments as 100% equal to evaluation. To him, when assessors constructed an argument about translations that already existed, their foremost task was to find norms underlying the translations (Toury 2012: 73). By identifying like this, Toury made it clear that translation assessment was expected to extract norms reflected by translations. Yet Toury, consciously or subconsciously, shunned translators and their roles in translation, though he emphasized the description and explanation of their tangible end products.

To make an integration of both translators and their products as a united whole of the process, Zhou Lingshun, a Chinese scholar, proposed the notion of "The Translator Behavior Criticism" within the scope of sociology, evaluating the translations starting from translators' behavior, which could be constrained by both linguistic and sociological factors. From his conceptual framework, a text could be evaluated from two directions, of which one was to weigh the textual characteristics themselves, like language, style, form and content. The other was to consider the influence of sociological factors, like cultural and social backgrounds, the authors' education, and ideology. The key to this notion is the evaluation model of the continuum from "*qiu zhen* (truth-seeking)" and "*wu shi* (utility-attaining)" (Zhou 2014b: 58). Zhou's concept, on the descriptive basis, focuses on describing and explaining the translation phenomena in combination of the two points: seeking the true meaning of texts on the linguistic level and attaining the practical purpose in the target field.

Initially, scholars of translation studies in China noticed the translator's subjectivity at the end of the 20th century (Shu and Yang 1999), which started their thinking about the role of translators in the process of translation, like the "obtrusion" of translators in translation (Chen 2002: 18), or the translator identity (Tian 2000: 20-24). The role shift was also one of the interests from "translator subjectivity" to "translator-centeredness" (Hu 2004: 12). With Gideon Toury's descriptive translation studies introduced to China, research on translation also underwent the change of paradigm from prescription to description within the framework of sociology (Xing 2007: 10-15; Li 2007: 6-9). Zhou first borrowed "translator behavior" into his research in 2010, and established his own evaluation model for translation within the sociological framework based on the descriptive translation studies (Zhou 2010: 93-97). Later he formed the theoretical framework named Translator Behavior Criticism (Zhou 2014b).

Since its emergence in the translation studies circle of China, Translator Behavior Criticism has increasingly aroused Chinese scholars' interests in adopting it as their theoretical basis for translation studies. To see how it has influenced translation studies researchers in China, I conducted an advanced search for CSSCI (Chinese Social Sciences Citation Index) source journals in CNKI (China National Knowledge Internet), with "translator behavior" respectively as the key words, in the abstract, or in the title. Then I added *"qiu-zhen wu-shi (truth-seeking, utility-attaining)"* to "translator behavior", while changing the condition that they appeared in the whole article. After that, I used "Zhou Lingshun" as "author" to search for articles he wrote. At last, I scanned all the documents obtained from the above searching and deleted those not relevant to the concept. By doing so, I got altogether 117 articles.

In general, those essays related to "translator behavior" comprise three dimensions, the first of which is theoretical introduction and development. Zhou began to introduce his concept in 2010, to which he has added a collection of 10 essays in sequential order to do his preliminary research on it over the span of three years till he established his "Translator Behavior Criticism". The second aspect is the improvement of the theory and its application. Zhou and some other scholars in the Chinese mainland further developed his theory, improving the model of the Continuum, making clearer the relations between "*qiu zhen (truth-seeking)*" and "*wu shi (utility-attaining)*", or emphasizing the sociological basis for translation studies (Zhou 2014a, 2019; Qian and Liu 2015; Feng 2019; Fu and Zhang 2020; Fang 2021; Wang 2020). No less significant is the fact that his theory was applied to explain the translation phenomena. After Translation Behavior Criticism was noticed by the researchers in China, they started to adopt it in their analysis of translations, especially translation of literary works (Dai 2017; Huang and Wang 2018; Zhou and Zhang 2018; Zhu

2021; Li and Yan 2022). The third dimension is construction of an analysis model and methodological explanation of the theory (Zhou and Zhao 2015; Luo 2020; Zhou 2021).

If reviewing both Toury's and Zhou's concepts, we may find the difference between them, as Toury took the translator's behavior as only a part of the whole process of translation behavior, and he included all factors in his identification of translation behavior, like agents, editors, revisers, censors (Toury 2012: 81), while Zhou only considered the major role of translators in the translation process, which made him in line with Toury when he set the Model of Continuum between "*qiu zhen*" and "*wu shi*" from the sociological perspective, trying to find a reflection of the relationship between the source and target culture and/or language. Be that as it may, Zhou emphasized the role of translators, and in Zhou's view all other factors mentioned by Toury seemed subordinative to translator behavior instead of interdependent with each other. Notwithstanding their points on translational or translator behavior, they did not take into consideration the translator's emotions and their roles in the process of translation. Therefore, I am going to make a trial study focusing on the role of translator emotions in translators' behavior during the translation process.

3.   Methodology

3.1   Subjects and Data

In this study we chose the emotions as our topic in *David Copperfield* and its two Chinese translations, respectively, by Lin Shu (1852-1924) and by Xu Tianhong (1907-1958), of which the former was written in ancient Chinese and the latter in modern vernacular Chinese. Though the two translators were born in the late Qing Dynasty, with Lin nearly 50 years earlier than Xu, Lin mainly received the ancient Chinese education and passed the provincial civil service examination. He was skilled at writing the ancient Chinese of the Tongcheng School, yet bitter against the modern vernacular Chinese and the New Culture Movement around the time of the May 4th Movement in 1919. He was especially famous for his co-translation with his friends as oral speakers of foreign novels into ancient Chinese. He introduced the first-, the second- or even the third-class writers and their works of many foreign countries like England, America, France, and Russia, yet whether the writers were extraordinary or not, his translations have always been regarded as the most influential classics since publication. Thus, he was considered a gifted translator in the translation circle of his time. His 1908 translation of *David Copperfield* proved so popular with readers that six different editions were released from 1908 through 1925. Lin's translation continues to be regarded as a classic.

On the contrary, Xu greatly preferred the modern vernacular Chinese. He criticized Lin's translation of *David Copperfield*, as the latter "wrote" it at his will based on his oral co-worker's narration, which resulted in a totally different text from the original. What was even worse was that Lin wrote in the ancient Chinese, which dressed Dickens in veils that prevent the readers from recognizing his "true identity" —— the most welcome writer in England. He strongly believed that Dickens' work should be translated into the modern vernacular Chinese so that Chinese readers could know the writer most comprehensively and in the best way. For that reason, he translated *David Copperfield* in 1943, thirty-five years after Lin Shu's translation. Xu's version is the first cover-to-cover translation in

modern vernacular Chinese in China. Did he really achieve his goal of manifesting a real Dickens?

The present study is done within the framework of Descriptive Translations Studies (DTS) under "a descriptive-explanatory working hypothesis" (Toury 2012: 32) to make a comparison between the two versions on the theoretical foundation of "adequacy and acceptability". The instrument adopted in this study is R, a free software environment for statistical computing and graphics. In R, sentiment analysis can be done automatically with the default package of *syuzhet*. There is another dictionary package named *sentimentr*, which is also designed to quickly calculate text polarity sentiment in the English language at the sentence level and optionally aggregate by rows or grouping variable(s). Both of them have been adopted in this study.

As for the object, specifically, I choose the first half of the book, i.e., from chapter 1 to 31. The reason is that according to the emotional curve of the original works done by sentiment analysis with the dictionary package *syuzhet* in R in Figure 1 (The *Syuzhet* package attempts to reveal the latent structure of narrative by means of sentiment analysis. It also reveals the emotional shifts that serve as proxies for the narrative movement between conflict and conflict resolution. It is now the default package used for sentiment analysis in R), these chapters are from 0 to 9124 on the line of the narration time. It is obvious that the emotional development in the latter part of the book undergoes coupling with the former part. Therefore, analyzing the emotions in the first half of the book can give us a clear picture of emotional features.

On the other hand, this study is a preliminary one among a series of studies for the comparison of emotions between the original and the translations, as well as between the retranslations of the two Chinese versions, aiming to justify the emotions' keeping consistency when the Chinese versions are retranslated into English.
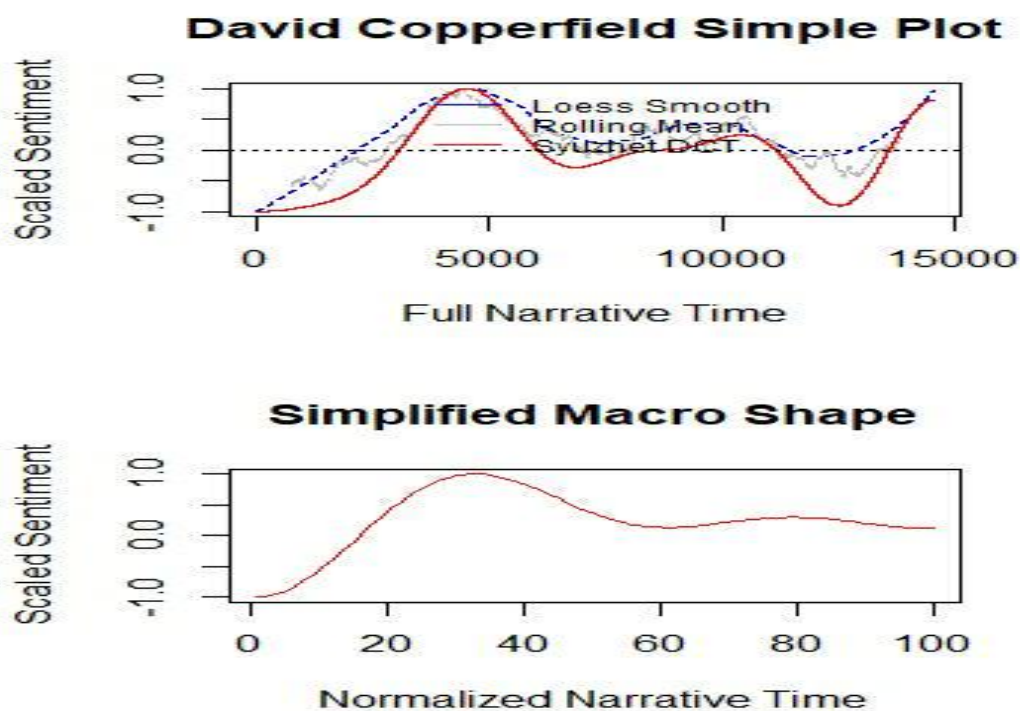

Figure 1. Sentiment Curves of David Copperfield Based on Narrative Time

3.2   Research Questions

Based on the above aim, the study is going to answer the following questions:

I. Is it possible the emotions in the source text are recovered when the Chinese versions of the source are retranslated into English by Google Translate (GT)?

II. To what extent are emotions in the retranslations of Chinese versions recovered when retranslated into English compared with the source text?

III. How do translators' emotions work in their translational behavior during the process of translation?

3.3   Methods and Data Collection

In this study GT and the lexicon-based sentiment analysis are adopted to compare the emotions in different Chinese versions and those between them and the original. Specifically, the R packages *syuzhet* and *sentimentr* are used. Though the two are quite similar, the latter takes into consideration valence shifters such as negators (not), intensifiers (highly), downtoners (slightly), or adversative conjunctions (however), all which may change the sentiment values of the sentence (Rinker 2018). Regarding the mechanism of valence shifting, it may increase the accuracy of sentiments with *sentimentr*. Therefore, *Syuzhet* is used to obtain the general curve of sentiment changes, while *sentimentr* for concrete measurement of emotions in the study.

As both English and Chinese belong to two totally different language families, emotions embedded or expressed in the languages are far different, even though people of the two languages may share some common or general emotions, like love, hatred, surprise, and joy. The emotional dictionaries in the two languages are set based on different standards. Under such circumstances it seems unfeasible to compare the emotions in the two languages. However, it does work to compare them in the same language. As sentiment analysis has been proved to have a high percentage of accuracy reaching almost 90% (Mukhtar, Khan, and Chiragh 2018; Rout et al. 2018) dealing with English texts, it might be a solution that the Chinese versions are retranslated into English for comparison, though the purpose changes accordingly, turning to the degree of emotional recovery when Chinese translations are retranslated into English. Notwithstanding the above, it is necessary to take this step as the initial one, as it can be evidence to show the transfer of emotions in translation.

Given this fact, retranslations of the two Chinese versions are to be compared with the original by sentiment analysis. Regarding retranslation, it seems so arduous a task as 31 chapters are not a short passage. A possible solution to it is to retranslate the two Chinese versions by using GT, as the quality of translating Chinese into English has been greatly improved after its system was equipped with an artificial neural network which can explore a very large training corpus of previously translated texts to "learn" to translate with the help of machine learning techniques (Bowker 2020: 288-98). To test whether it works, I chose the first chapter of the two Chinese versions to do a pilot study.

First, the two chapters were translated into English by GT. Then I proofread them, correcting mainly grammatical mistakes. Only when there were omissions or errors in understanding did I mend or correct them. Sentiment analysis with *sentimentr* was done to them both before and after manual intervention.

Yet before sentiment analysis was adopted to the original, one point needs not to be neglected. *David Copperfield* was first published in 1850, so words and expressions may have gone through some changes in a time span of 172 years. However, this factor is not taken into consideration in the study. Regarding the two Chinese versions, Shu Lin translated the novel into classical Chinese language that was far different from the modern vernacular Chinese. On the other hand, the modern vernacular Chinese in Tianhong Xu's era is also different from that of today. Under such circumstances, the first problem is whether the classical Chinese can be translated by GT or not. The result is encouraging, as is shown in Tables 1 and 2.

Table 1. Sentiment Analysis before Manual Correction

Original/translation	Word number	Standard deviation	Average sentiment
Dickens	4644	0.2936803	-0.04533722
Lin retranslation 1	2922	0.2453278	-0.06262544
Xu retranslation 1	4382	0.3393861	-0.02423912

Table 2. Sentiment Analysis after Manual Correction

original/translation	Word number	Standard deviation	Average sentiment
Dickens	4644	0.2936803	-0.04533722
Lin retranslation 2	3126	0.2785309	-0.05118268
Xu retranslation 2	4426	0.3467767	-0.01844385

From Table 1 it is evident that emotions in the two translations have been transferred, and more negative emotions in Lin's version were transferred than those in Xu's, even more than those in the original. It is interesting to note that Lin Shu ever commented in the preface of his translation of this book that he was completely pulled by the emotions flown in the story, so that he was no less a puppet of the author who dragged him emotionally towards the way at the author's will (Dickens 1980). His emotions, especially more negatively, were truly triggered in his translation.

According to Table 2, manual correction of the machine translation text does bring some changes to the word number, the standard deviation and average sentiment, yet the general tendency of changes of the two versions keeps being consistent, both with more words and turning to be less negative. What makes this significant is that after manual work, Lin's translation is more congruent with the original in emotional expressions, while Xu's seems further from the original, down towards the neutral.

From the two tables it may be safely concluded that GT seems feasible to be used to retranslate the two Chinese versions to measure sentiments and emotions. Therefore, in the following, the 31 chapters of the two Chinese versions are retranslated by GT for analysis.

It should be noted that *senticnet* is about concept-level sentiment analysis, including tasks like polarity detection and emotion recognition by leveraging the denotative and connotative information associated with words and expressions other than sole word co-occurrence frequencies, and it has a total number of 23,626 sentiment words in its lexicon, the largest of all sentiment lexicons provided by *syuzhet* and *sentimentr* (Lei and Liu 2021: 32); therefore *senticnet* lexicon is added to the sentiment analysis.

3.4   Results and Discussion on the Google-Translate Texts

3.4.1   Results and Discussion by Adopting *Syuzhet* Package

By using *syuzhet* package (referring to Jockers & Thalken, 2020, for its usage), the general sentiment values and the emotional valences of the three texts were obtained, as shown respectively in Table 3 and Figure 1.

Table 3. Sentiment Values of the Original and the Retranslations of Lin and Xu

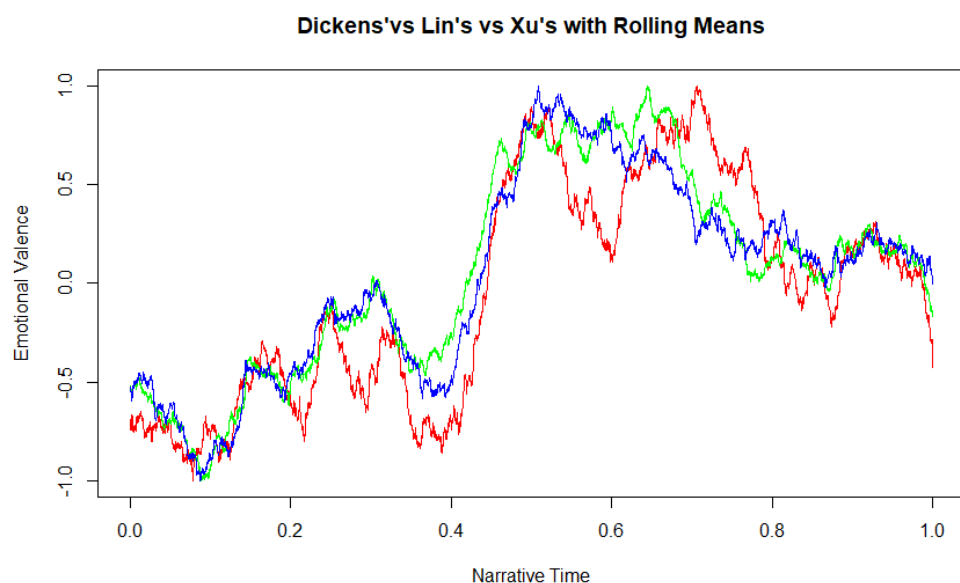| Texts	Dickens' works Chapter 1-31	Retranslation of Lin's Chapter 1-31	Retranslation of Xu's Chapter 1-31
Sentiment value	-193.1	-169.95	-231.75
Mean value	0.342542	0.121547	0.2239101
Standard deviation	1.108596	0.8247374	0.9527305
Word-count	188652	131870	179346

Figure 1. Emotional Valence with Rolling Means according to Narrative Time
    (Among the three lines, green, red and blue respectively stand for emotional valence in Dickens', Lin's and Xu's works.)

    Table 3 shows that there is far more negative than positive language in the three texts, among which Xu's retranslation is a little more negative than the other two texts, while

Lin's is least negative of all. Except for that, Dickens' source text has the biggest vocabulary, the highest mean value and the standard deviation, while Lin's has the least. That is to say, the original has more overall variance in sentiment values than the translations, which means that the original novel might have more complicated twists and turns in emotional changes. Be that as it may, it is so clearcut that the emotional development in the two Chinese versions closely approximates that of the original, as is drawn in Figure 1. Certainly, it can also be found that Lin's retranslation fluctuates more than Xu's, and Xu's corresponds highly to the original. Based on the above data, a safe answer may be drawn to the first research question: the emotions can be recovered from retranslation by machine translation.

3.4.2   Results and Discussion by Adopting *Sentimentr* Package

By using *sentimentr*, all the emotional words were extracted and categorized into 8 general emotional types, and for each type, two sub-branches are also given, based on whether there are negations in the sentence, as is shown in Table 4.

Table 4. Emotion Types and Words in Total and in Each Type of Three Texts

Texts		Dickens' works Chapter 1-31	Retranslation of Lin's Chapter 1-31	Retranslation of Xu's Chapter 1-31
Word count		188652	131870	179346
Sentence number		7502	7964	10276
Total emotion count		25725	19304	25055
Emotion_type/ emotion count	Anger	1646	1444	1651
	Anger-negated	136	227	219
	Anticipation	4469	3313	4425
	Anticipation-negated	281	460	397
	Disgust	1343	1039	1397
	Disgust-negated	103	140	146
	Fear	2401	1687	2267
	Fear-negated	218	250	277
	Joy	4094	2680	3914
	Joy-negated	244	327	328
	sadness	2607	2264	2644
	Sadness-negated	226	256	262

Surprise	2003	1320	1844
Surprise-negated	125	181	204
Trust	5829	3716	5080
Trust-negated	364	473	421

According to Table 4, it is obvious that not any type of emotions is totally the same for either two texts, neither is the numbers of total emotional words and sentences. If we take a good look at each type and its negated type of emotions of Xu's retranslations, the numbers are much closer to those of the source text. If we compare the words in Table 3, Xu's retranslation is more similar in shape to the source. That's why the curve of Xu's retranslation is more in line with that of the original. The numbers of emotional words can partly answer the second research question: Xu's retranslation has recovered the emotions of the original more than Lin's. In considering the whole vocabulary of emotions, Xu's retranslation has recovered over (25055/25725) 97% of emotions of the original, while Lin's recovered about (19304/25725) 75%. It is also a proof that the content words containing emotions in ancient Chinese can be translated into English to a high degree.

Sentimentr can also read the sentiment of each sentence, whether it is positive or negative. For example, the first twenty sentences, their word number and sentiment value are listed in Table 5. Yet it must be noted that the sentence number here does not mean that the original and the two retranslations are in line with each other, but refers to the sentence number in their own texts. In other words, a sentence in the original might not be retranslated into a sentence, but two or more sentences, or part of a sentence. For example, sentence 3 in the original is "It was remarked that the clock began to strike, and I began to cry, simultaneously." While in Xu's translation, he used two ellipses to indicate the continuous ringing of the clock bell, which, after being retranslated into English, were regarded as full stops, so this sentence was read by the machine into 3 sentences from sentence 3 to sentence 5. The whole sentence is "It is said that when the clock was ticking ... clanging ... I started to cry too." That is also the reason why the sentence numbers are totally different, as is shown in Table 5, in which the original text has the least number of 7502, Lin's the number of 7964, and Xu's the most of 10276. It may also indicate my deficiency of dealing with data on computer, which requires improvement in later studies. Anyhow the change number of sentences does not change the tendency of sentiment development with the narration time going on, as we can see from Figure 1. That is to say, the emotional words in translations are likely to accord with those in the original.

In Table 5 it can be found that different translators have their specific means to express their emotions, with different word numbers for each sentence and involving different emotional arousal.

Table 5. Emotion Words and Sentiment in Each of the First 20 Sentences

Sentence number	Word-count			Sentiment		
	Dickens' text	Lin's retranslation	Xu's retranslation	Dickens' text	Lin's retranslation	Xu's retranslation
1	30	33	26	0.136931	0.034816	0.166699
2	32	23	26	0	0	0
3	15	13	9	-0.3873	0.22188	0
4	89	17	1	0.264999	-0.24254	0
5	27	40	5	0.057735	-0.22927	-0.33541
6	34	13	81	0.205798	-0.16641	0.038889
7	34	24	29	0.514496	0.347011	0
8	21	27	24	0.218218	-0.09623	0.428661
9	69	29	28	0.284412	-0.11142	-0.27166
10	59	16	20	-0.23434	-0.125	0
11	25	28	65	-0.52	0	0.160005
12	52	24	23	-0.03467	-0.26536	0.07298
13	26	30	40	0.524611	-0.57511	-0.04743
14	62	19	21	-0.1905	0.114708	0.37097
15	19	7	22	-0.11471	0.151186	-0.38376
16	35	13	51	0.481738	0.069338	0
17	15	19	24	0	-0.34412	-0.06634
18	5	16	50	0.156525	0.25	-0.24749
19	19	28	21	0	-0.0378	-0.43644
20	30	10	26	0.136931	0.56921	0.166699

From the above results, we may boldly claim that emotions do transfer from the literary works to translations, though changes, displacements, distortions, even opposite emotions might flow with the plot going on. In Table 5, the sentiment polarity remains the same for the first two sentences, but the original sentence 3 showed a negative sentiment, while Lin translated it into a positive one. As for Xu's, sentences 3-5 together are the corresponding sentence translation to the original. If we want to see how sentiment changes between the original and its corresponding translations, it might be that the three sentences be put together. To make it precisely, the sentiment is -0.33541. Though it is also negative, the value is different from that of the original (-0.3873). The results reflect the hermeneutic openness of a text, as William Blake wrote in one of his poems, "Both read the Bible day and night, But thou read'st black where I read white." (Gu, 2022, p. 80). Still, translators do not let their emotions flow as they wish, for any translation is constrained by interpretive language use, which means it depends on the original text (Kajzer-Wietrzny, 2022, p. 131). In such cases, machine translation might have but a minor impact on emotional expressions in literary works, which would not play a key role in the measurement of sentiment and emotions, for the curves of emotional development in Figure 1 have shown the approximate tendency of emotional flows with the narration going on. This result also indicates the rationale for sentiment analysis is extraction of emotional words and expressions, which might be less concerned about grammar, and least about sentence structure. As such,

retranslations by GT have shown a great congruence of emotional flows between the original and the translations. To put it in a different way, "whenever a TL item is substituted for another, both the replacing and replaced items tend to belong to approximately the same type of language." (Toury, 2012, p. 233). With the same type of language, the emotions embodied in it may remain the same. Therefore, whether the translations were written in the ancient or modern vernacular Chinese, since GT can tell the emotional characters in the texts, the emotions in the retranslations can be recovered to a large extent. The more the emotional characters can be recognized in the machine translation, the larger the extent is to be.

3.5   The Role of Translators' Emotions in their Translational Behavior

The above data have shown that translators' emotions do exist in translation. Then how do they work in the process of a translator's decision making? I am trying to seek for the answer within the framework of DTS and Zhou's Translator Behavior Criticism, considering both internal and external factors that might influence emotions.

3.5.1   The Language Factor

In consideration of language in translation, Lin translated the original work into ancient Chinese, while Xu chose the modern vernacular Chinese in his translation. It is believed that the vernacular language is the tradition of novel writing, for novels are created for their popularity among the folks. Therefore, since Song Dynasty, the ancient vernacular Chinese had been adopted in the vernacular novels, and in the four most influential novels of Chinese literature history, namely, *Romance of the Three Kingdoms*, *Heroes of the Marshes*, *A Dream in Red Mansions*, and *Journey to the West*. From that time until the May 4th Movement of 1919, the modern vernacular Chinese evolved, which gradually developed into the modern Chinese that we are now using (Gao 2017: 109-18). Regardless of that, Lin was a proponent of the Tongcheng School of Literature, which emphasized the "roots in the traditional thought literature of China" (Tian 2003: 4), advocating the writing style from the Warring States Period to the Han Dynasty of China, and taking books like *The Book of Songs*, and *The Analects of Confucius* as models for writing. Therefore, he did not translate the book in the ancient vernacular Chinese. Instead, he did it in ancient Chinese for its brevity yet elegance, which could be more appealing to the target readers. Let's look at Example 1:

Example 1

Original: My father's eyes had closed upon the light of this world six months, when mine opened on it.

Lin's version: 方吾张眼能视时，正去吾父瞑目长逝可六个月（，）

(GT: When Fang Wu opened his eyes and could see, he was going to my father to rest his eyes, and he passed away for six months.)

(Literal retranslation: When I opened my eyes, able to see things, my father had closed his eyes, and long passed away for six months.)

Xu's version: 当我对这世界上的光线张开我的眼睛来时，我的父亲的眼睛已对它合拢了六个月。

(GT: When I opened my eyes to the light of the world, my father's eyes had been closed to it for six months.)

(Literal retranslation: When I opened my eyes to the light of the world, my father's eyes had been closed to it for six months.)

It is obvious that Lin's version is part of a sentence, much shorter (19 characters) than Xu's (33 characters), though both express similar meanings. A significant point is that GT can perfectly do literal retranslation of the modern vernacular Chinese, as is shown the retranslation of Xu's version done by GT, but it could hardly tell the meanings of functional words and pronouns in the ancient Chinese adopted by Lin Shu. In Lin's version, "方" is a functional word meaning "when" in English, "吾" is the pronoun "I", "正去" means "just be". The good news is that the key content words are all recognized by GT. Given that most emotional words are content words, it cannot be hard to understand why retranslations of the ancient Chinese could also recover the emotions in the original, and the more words to be recognized, the greater the possibility that the emotions would be recovered.

Let's now look back to the two versions again. The difference is that Lin translated "closed upon the light of this world" into "closed his eyes and long passed away", while Xu strictly kept the accuracy of the original, exactly mostly the same to it. Reading Lin's version, we can see clearly that he not only literally translated "closed (his eyes)", but also purposefully made the meaning explicit to the target reader, adding "passed away". Meanwhile he emphasized the time that "my father" has "long passed away". The character "长 (long)" in ancient Chinese is always followed by "逝 (pass away)", both together often combined with another two characters "阖目(closed eyes)" to form a phrase, meaning "close one's eyes permanently" in an elegant way. Lin changed "阖" into its synonym "瞑", without changing its meaning. In this case, Lin's version reflects his consideration of the acceptability of the original in China of his time, preferring the Chinese tradition of expressing "death", and showing a great facility for writing in ancient Chinese. Given all of the above, Lin's translation is emotionally much closer to the target readers, which might be more acceptable to them. Therefore, all his translational behavior is a mirror of his emotional maneuvering among those heterogeneous constraints of target culture, target tradition and his own talents of language in the target world.

On the other hand, Xu Tianhong, having gone through the "New Culture Movement" of China around the time of the May 4th Movement in 1919, advocated so much the spreading of the modern vernacular Chinese in China. He had so strong a desire to exhibit "the real Dickens" to the Chinese reader that he rigidly followed the original, just taking the sentence as his translational unit, never missing a word in the original. He might have an intention to keep great adequacy vis-à-vis the original, which can also be found from Figure 1, where Xu's emotional line is much more similar to, even overlapping in some part, the original than Lin's, though both have a tendency to follow the original. Xu, however, never expected to be emotionally unfriendly to us target readers, for the linguistic forms and structures seem

quite rare and strange to us, which must take our time and energy to react to what he intended to let us know. If reading Xu's version again, we can find he translated every word in the original, except that he changed the sentence order to be fit for the logic of Chinese speaking. In this regard he did try to balance the difference between the two languages so that our target readers might emotionally accept his translation.

Therefore, to keep adequacy of the original, the translator emotionally guesses what might happen in the author's mind and writes it down. In this case it might be emotionally distant from the target readers, as they need time to react so that their emotions may be elicited. On the other hand, when the acceptability of the target readers is taken into consideration, the translator may naturally be driven by his own emotions that are familiar to the target readers so that they may be more acceptable.

3.5.2   The Narrative Style

In dealing with the narrative style of the text, Lin turned all indirect speeches of the original into direct ones, which made the emotions more direct and easier to strike a chord with readers, while Xu never did.

Example 2:

Original: I preceded Mr. Omer, in compliance with his request; and after showing me a roll of cloth which he said was extra super, and too good mourning for anything short of parents, he took my various dimensions, and put them down in a book.

Lin's version: 余即随出，乌麦出黑布示余曰："此为美材，非父母死者，不能骤用此材。"于是以尺量余身。

(GT: Yu immediately went out, and Wu Mai came out with black cloth and said to Yu, "This is a beautiful material, and it is not a person who has died of his parents. You cannot use this material suddenly." So he measured the rest of his body with a ruler.)

（Literal translation: I immediately followed, and Omer showed me with black cloth and said to me, "This is of high quality, and no one would abruptly use it except for the occasions that his parents would die." Then he took my dimensions with a [tailor's] tape.）

Xu's version: 我遵照着奥默先生的话，比他先一步走到了店堂里去；他给我看了一卷布，据他说这是特别优等的丧服料子，如所丧的不是父母，那真是太好了；于是他量了我的各项尺寸，把它们记在一本簿子上。

(GT: I followed Mr. Omer's words, and went into the shop one step ahead of him; he showed me a roll of cloth, which he said was a particularly good mourning material, and it would be nice if the bereaved were not the parents; so he took my measurements and wrote them down in a book.)

（Literal translation: I followed Mr. Omer's words, and went into the shop one step ahead of him; he showed me a roll of cloth, which he said was a particularly good mourning material, and it would be nice if the bereaved were not the parents; so he took my dimensions and wrote them down in a book.）

Reading the two GT versions, we can also find there are quite some problems in Lin's retranslation, but most content words have been translated, which embody the emotions in the sentences. What might be surprising is that Xu's GT version, again, shows a great similarity with the literal translation.

In the original sentence, Dickens adopted an indirect speech to show us what Omer did to "me". In a strict sense, the author wrote one sentence, though he used a semicolon to separate the whole sentence into two parts, which both yet show a relation of continuation. In the case of the two translations, it is apparent that Lin used far less characters (only 34) than Xu did (79 characters), both transferring the similar information. What counts is Lin translated it into a direct speech, turning the sentence into two, putting "my" action and Omer's words in one and his action in the other. By directly quoting Omer's words, Lin triggered a strong emotion among the target readers that cloth of super quality just mourning for parents carried a grief of great intensity. Through the whole book, Lin did keep a few indirect speeches in the original in his own translation, but in most cases, he changed them into direct speeches.

On the other hand, Xu's translation turned the original into three continuous sentences by using two semicolons. His long version is more a narration of the event than an emotional arousal. The reasons for their differences to do so are from both Chinese literary traditions and their respective emotional style constrained by cultural and social factors.

The New Culture Movement of China brought the great changes of novel creation, one of which was the breakthrough of narrative pattern in the forms of reporting. In ancient vernacular novels, the reporting form in novels already existed, which was then conversational in nature, mainly in the form of direct speech, for the purpose of involving readers in the seemingly real situation so that they might have deep empathy with the characters. The movement introduced indirect speeches, free direct speeches and free indirect speeches in foreign literary works into China. (Ma and Jin 2020: 152-58). Lin Shu, with a very clear mind of what emotions he would like to arouse in the target readers' mind, chose to translate those indirect or free indirect speeches into direct ones, so readers were, as he said, really "emotional puppets" (Dickens 1980: ii), who, to be frank, were controlled by his depiction instead of the author's.

Regarding Xu Tianhong, he was just living in the era when the New Culture Movement around 1919 was launched with great vigor. Greatly influenced by the concept of new cultural reform, he believed that the introduction of foreign literature should keep its original style so that it could not only present the original to the target readers, but also innovate the ancient Chinese language and literature. His primal emotions were mostly constrained by his analysis of the sentence meaning of the original, so he tried all his best to be as adequate as the source text in language form, ignoring the fact that the target readers might be hurt and that they might find it hard to accept such a translation written in their own language.

3.5.3   The Translational Unit

Toury emphasized the importance of the translational unit, saying that "the establishment of units for a comparative analysis which focuses on reconstructing rather than implementing translational decision-making cannot proceed on the sole basis of the position and role, let alone on the mere presence of features in source language texts." (Toury 2012: 116). When Lin was doing translation, he never considered much of the source language and its meaning; instead, he reconstructed the original in Chinese culture, considering paragraph, the development of event or even the emotional turn as the translational unit. Contrary to him, Xu never changed his choice of taking the sentence as the translational unit, translating one sentence after another, and mostly inflexibly.

Example 3:

Original: He stands before me again, his bluff hairy face irradiating with a joyful love and pride, for which I can find no description. His honest eyes fire up, and sparkle, as if their depths were stirred by something bright. His broad chest heaves with pleasure. His strong loose hands clench themselves, in his earnestness; and he emphasises what he says with a right arm that shows, in my pigmy view, like a sledge hammer.

Lin's version: 目张而气促，伧状娱人，至得意时，则高麾其拳，大如巨锤。
(GT: His eyes are open and his breath is short, and he is entertaining people. When he is complacent, he will raise his fists, as big as a giant hammer.)

（Literal translation: His eyes are wide open, chests heaving with rigor, which seems he is quite joyful. In his glory, he uplifts his fists high which are as huge as a sledge hammer.）

Xu's version: 此刻我还可看到他站在我的面前，他那粗糙多毛的脸上放射着一种我无法言喻的欢乐的爱情和得意。他那双忠厚的眼睛燃烧了起来，灿烂发光，好像它们的深处被什么光辉的事物搅动着似的。他那宽阔的胸膛欢喜地起伏着。他那双强壮的、松弛的手因恳切而紧握着；他用其右臂来强调他所说的话——这支胳膊在我的矮小的视线中，好像是一柄巨槌。

(GT: I can still see him standing in front of me now, his rough, hairy face radiating a joyous love and smugness that I cannot express. His faithful eyes burned with brilliance, as if something brilliant was stirring their depths. His broad chest heaved joyfully. His strong, slack hands were clasped with earnestness; he emphasized what he said with his right arm, which in my little sight seemed like a giant mallet.)

（Literal translation: I can still see him standing in front of me now, his rough, hairy face radiating a joyous love and smugness that I cannot express. His faithful eyes burn with brilliance, as if their depths were

> stirred by something brilliant. His broad chest heaved joyfully. His strong loose hands clasp in his earnestness; he emphasizes what he says with his right arm, which, in my pigmy sight, seems like a giant mallet.）

The original presents a vivid picture of Mr. Peggotty, his appearance and behavior, showing to readers a strong and joyful man imbued with love and energy, who seems easy-going and pleasing to contact. In Lin's version, Peggotty's appearance and behavior are also depicted, yet in a far brief and different way. The "bluffy hairy face" was omitted, which might not arouse the similar emotions of "love and pride" in Lin Shu's heart, since in Chinese culture such a face could hardly be related to anything loving or good to look. He also gave up the detailed depiction of Peggotty's eyes, which seemed unreal to Lin Shu, which ran in the opposite direction of the literary tradition of his era, i.e., the pursuit of reality. Thus, it is understandable why he omitted information of this kind. He did keep the images of eyes, chests, and hands, all in positive description, showing a strong man full of joy, vigor, and strength. From the emotional perspective Lin achieved the same goal as the author intended to. In this sense he took the total description of Peggotty as his translational unit, and retained the key emotions in it.

As for Xu Tianhong's version, he took the sentence, if not the word, as the translational unit. Not one word of the original was missed or omitted in his version. Reading his words, we can find some expressions are quite unfamiliar to the target language, even today. For instance, he literally translated "love" into "爱情", a noun in Chinese meaning "love", especially referring to the passion between a man and a woman. It might be appropriate to translate it into "爱". This character can be used as a noun or a verb, and fit for all occasions when one loves another. A possible benefit from his translation may be his creation of the vernacular Chinese expressions, like "忠厚的眼睛 (faithful eyes)" "宽阔的胸膛欢喜地起伏着 (broad chest heaved joyfully)" "在我的矮小的视线中 (in my pigmy sight)". All these expressions, which might rarely be used in Chinese, can now be regarded as transferred epithets. In this sense, adequacy towards the source text may increase the creativity of the target language, though it might prevent target readers from having empathy with it.

Thus, to answer the third research question: "How do translators' emotions work on their translational behavior in their translational process?", I may develop a scalable continuum of emotions that anchors between the two extremes of the author's emotions on the one pole and the translator's emotions on the other, as exhibited in Figure 2. Translators first are readers of the original, so their emotions are ideally regarded as the target readers' emotions, regardless of the personal differences here.
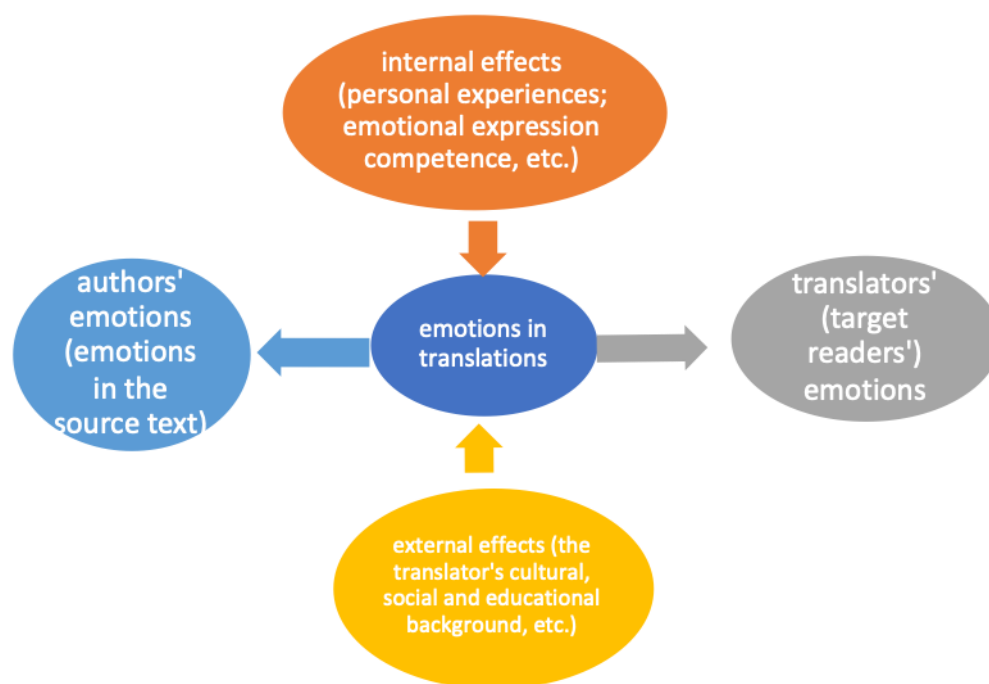
Figure 2. The Continuum of Emotion in Translation

The graph in Figure 2 clearly shows that the translation emotion occupies the central situation of the scale, keeping a balance between the two extreme points. Yet it never stands still; instead, it keeps changing with a translation process going on, and with different translators operating the procedure. When the continuum is formulated, several premises are set for its establishment. On the one hand, the author's emotions have been truly and totally reflected in the original works. It has been evidently shown in the graph that the author's emotions are equal to those in the source text. On the other hand, translators first are the readers of the original, their emotions to the extremity are those of target readers. Besides, their emotions are also a direct reflection of how they experience the target world around them, which are consistent with their core values in the target culture (Tamir et al. 2016: 67). In this sense the translator's emotions can be safely assumed as representations of those contained in the target culture.

The movement of the translation emotion on the continuum also reflects the translator's proximity to either pole: if the translation emotion goes closer to that of the source text for the adequacy of the original, the translators are more tending to be author-like in choosing words with emotions, as Xu Tianhong did in his translation. The more adequate translation emotions are to the original works, the greater the probability that translators sacrifice their own emotions for the authors'. By doing so, translators might create some new phrases, expressions, images, or concepts in the target language, which may seem unfamiliar to readers so that they need time to accept them. In this regard, translators' emotions are more likely to keep adequacy at the price of acceptability.

On the other hand, the closer translation emotions reach to the translators', the more acceptable they are to the target readers. In the translating process, translators' behavior is a mirror of their mind's work. Emotionally driven by the target cultural and social factors, chances are that they make their decisions based on readership, which might be out of their

own mindset, a joint product of both internal and external factors such as translators' educational background, the social and cultural environment.

Be that as it may, the translation emotion can never totally be the author's or the translator's emotion. Instead, it will represent the blending of both. In other words, no translation emotion reveals a zero amount of either the author's or the translator's emotions, nor can it be a 100% revelation of either one's emotions. It is precisely the compromise between the two that keeps the translation emotion at a balancing point on the Continuum, and its movement on it reflects how a translator is concerned more about the adequacy of the original or the acceptability of the target.

4.   Conclusion

Translators' emotions do have an impact on their translational behavior. Emotions in different languages seem impossible to compare, but we may change them into one same language to see to what extent emotions have been recovered by translating. Machine translation can now reach great exactness in translating modern vernacular Chinese into English, even in literature translation, as is shown in Xu's translation above. As for the ancient Chinese, machine translation can also draw out the content words, which are what sentiment analysis deals with. Thus, if emotions emerge in the texts, machine translation can identify and translate them. In other words, emotional words in retranslations that are identified and translated by machine translation are inevitably those appearing in translations. This can be a precise proof that emotions flow from the original into the target language. Yet it requires qualitative work to see how emotions flow in the target language, depending on the translators' intentions to be adequately expressing what the original says or to be acceptable to the target readers.

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