

# Effects of Six Neural Machine Translators of the Two Business Major Text Types

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## Abstract

**This study investigates the effects of six major neural machine translators (NMTs) rendering four texts—E-C and C-E directions for the informative and the vocative. By comparing the errors and inadequacies, I found that western-produced NMTs are better at translating E-C and C-E informative texts, though they cannot render culture-loaded words. Baidu, Youdao, and WeChat are similarly good, yet sometimes with confusing blunders. Overall, QQ is the least satisfactory one. For highly vocative E-C texts, all the machine translators are fiascoes since they can only translate the surface meaning, sometimes even confusingly. For C-E vocative texts, DeepL and Google can produce acceptable sentences but retain every piece of information; Chinese-produced NMTs are better at dealing with culture-loaded words. This paper may provide some translation tips for Chinese researchers, the latest trends in NMT for teachers and researchers of the English language, and some insights for technical personnel.**

## Keywords

**Neural Machine Translators; Translation Tips; Translation Comparison.**

## 1. Introduction

Machine translation (MT) has existed since the 1940s and has flourished in recent times thanks to the proliferation of the web. MT was the first computer-based application in natural language processing (NLP), and its history is old (Hutchins and Somers, 1992). Now, MT has developed from the original rule-based translation method to the current neural translation method that simulates the human brain. In recent years, MT has, unexpectedly, dominated the translation field and profession, taking a new form of neural machine translation (NMT). According to the *China Language Service Industry Development Report 2022* published by the China Translators Association, 48.9% of translation clients relatively highly appraise the improved quality, reduced cost, and enhanced efficiency, though roughly similar proportions doubt the three aspects. Indeed, 252 translation agencies are equipped with machine translation and AI services, an even broader prospect over past years. In other words, except for a small number of text translations with precise quality requirements or other special needs, and the majority of interpretation being done manually, interpreters and translators still need IT for terminology preparation and related expertise queries. We seem to have been in an era of "no technology, no translation".

The vast majority of the existing research focuses on how to develop models, methods, or algorithms, to ameliorate the quality of translation. A few of them have used corpora-based, query-translation-based methods and some have studied the linguistic aspects of passive voice, prepositions, etc. In light of this, this paper attempts to analyze the quality and errors of six major NMT engines or platforms in translating four chunks of two major text types. I use Google Translate, Deep L, Youdao Translator, Baidu Translate, WeChat Translator, and QQ Translator. The first two are internationally renowned, the middle two most frequently used in translation

agencies in China, and the last two most frequently used among students and other groups. I hope that this paper can enrich research on the text-type analysis, help technical researchers fix the loopholes or network vulnerabilities, and offer some insights to students and faculty in translation studies.

## 2. Literature Review

### 2.1. Text Type

In his *Approaches to Translation*, Newmark (2001) categorizes text types into informative, vocative, and expressive. He details the function of the three types and how they should be dealt with. As for text emphasis, informative and vocative texts focus on the target language (TL) and the expressive text on the source language (SL). As for “focus”, the expressive text is writer-oriented or first-person, the informative situation-oriented or third person, and the vocative reader-oriented or second person. Apart from these aspects, he also outlines the unit of translation, type of language, loss of meaning, length in relation to the original and so on. Ye and Shi (2011) note that since Newmark's categories are based on his own translation experience with Indo-European languages, they may have certain limitations when applied to Asian ones. In work with the Chinese-English language pair, excessive focus on source text features often greatly affects readability, sometimes resulting in completely incomprehensible translations.

Reiss (1989) divides text types into informative, operative, and expressive. The first type is to represent objects or facts, the second is to appeal to text receivers, and the last is to express the sender's attitude. Most texts, however, have at least one function. Due to limited space, this study only explores the most typical text types in business translation: informative and operative.

### 2.2. Machine Translation

Over the last three decades, many investigators and field practice experts have proposed methods or models for performing and evaluating machine translation. Liu and Yu (1998), for instance, devise TransEasy, a Chinese English machine translation system based on a hybrid approach. Wu et al. (2016) propose Google's Neural Machine Translation System (GNMT), bridging the gap between human and machine translation. They use a human side-by-side evaluation on a set of isolated simple sentences, thus reducing translation errors by an average of 60% compared to Google's phrase-based production system. Ren et al. (2020) develop an English-Chinese machine translation and evaluation method for geographical names, one that is effective in the translation of English geographic names into Chinese and can be easily extended to other languages such as Arabic. Zhao et al. (2021) propose a high-performance model for English-Chinese machine translation, based on GPU-enabled deep neural networks with domain corpus. Since their experimental results show that we can achieve a maximum BLEU score of 29.2 and can further improve this score by tuning other hyperparameters, the model facilitates us having a shorter turn-around time. In the same year, Kang investigates automatic translation of spoken English based on improved machine learning algorithms. Liu and Muhammad (2021) focus on artificial intelligence (AI) and translation teaching from a critical perspective on the transformation of education. Li and Wang (2022) research the transfer learning-based English-Chinese machine translation. They assert that the SEQ2SEQ model by Xiao et al. (2019), which is the most useful and efficient attention-based neural machine translation model in the field of machine translation, does not consider the grammatical transformation between different languages. Likewise, the improved SEQ2SEQ model for English-Chinese translation mainly optimizes and evaluates the Indo-European language family and seldom optimizes Chinese.

Some researchers have investigated the linguistic aspects of machine translation. For example, Munteanu et al. (2004) show that a translation engine could benefit from parallel sentences automatically extracted from comparable corpora. Lin et al. (2021) automatic translation of spoken English based on an improved machine learning algorithm. Wang et al. (2010) investigate the re-structuring, re-labeling, and re-aligning for syntax-based machine translation. Wu and He (2012) investigate machine translation in query translation-based cross-language information access at multiple important aspects, which include query translation, relevance feedback, interactive cross-language information access, out-of-vocabulary term translation, and data fusion. They demonstrate that machine translation plays a significant role in resolving untranslated terms and in data fusion. Sun (2014) comparatively analyses English and Chinese passive voice in machine translation, using Google and Baidu translators to test three hundred passive voice sentences taken from an English-Chinese parallel corpus. Based on their study, they categorize the passive voice mistranslation into the completely wrong translation sentences with different kinds of grammatical problems; partly right sentences with an acceptable change of the synonym words.

Other researchers have empirically improved machine translation. Zhang (2017) delves into an internet-based English machine translation system and finds that it can complete rapid and effective translation with higher quality and efficiency compared with traditional machine translation methods. Cheng et al. (2018) propose to make both the encoder and decoder in NMT models robust against input perturbations by enabling them to behave similarly for the original input and its perturbed counterpart. Tan (2019) finds that neural machine translation (NMT) platforms are still lackluster in translating rare words such as Chinese idioms, poetry, spoken words and words “with Chinese characteristics”. In terms of text type, NMT platforms are proficient at translating professional text with certain patterns, good at government reports and bad at spoken materials. Baidu NMT outperformed Google NMT in translating Chinese into English, excelling especially in processing rare Chinese words. Zhao and Lin (2022) find that machine translation results mainly in pragmatic, grammatical, and lexical pretermissions, in particular the last ones. Wu et al. (2022) conduct a comparative experiment using the Chinese-English and English-Chinese news data from the 17th China Conference on Machine Translation (CCMT 2021). The experiment results reveal that their proposed strategy performs better than other commonly used monolingual data augmentation methods. They also find that adopting domain transfer before this combined strategy can further improve translation quality. Deng and Xue (2016) empirically explore the translation divergences in Chinese-English machine translation. By developing a hierarchically aligned Chinese-English Parallel Treebank (HACEPT), they can semi-automatically identify and categorize the translation divergences between the two languages and quantify each type of translation divergence.

Another strand of literature has compared several methods. Liu (2020) conducts both a general analysis of sentence length as well as cohesive devices and a detailed analysis of a sentence translation in SMT and NMT with human translation as a reference. She finds that compared with SMT, the NMT system is better at handling cohesive ties such as additive, adverbs, and pronouns; both SMT and NMT, however, underperform at dealing with demonstratives and lexical cohesion. Xu et al. (2020) apply two types of neural networks to the translation of chemical nomenclature between English and Chinese, and compare them with an existing rule-based machine translation tool. They find that deep-learning-based approaches have a great potential in preceding rule-based translation tools.

### **3. Deficiencies of Machine Translation in Six Sub-texts**

In this section, an English and a Chinese text are used for each of the three main text types. All are from business contexts, though some seem to be literary. I used Google Translate, Deep L,

Youdao Translator, Baidu Translate, WeChat Translator, and QQ Translator. The first two are internationally renowned, the middle two most frequently used in translation agencies, and the last two most frequently used among students and other groups.

### 3.1. Informative Text

#### 3.1.1. English to Chinese

The first text is a *Directions for Use*, an informative short text with context and devoid of florid or flowery words, even descriptive words.

##### The original 1:

[*Directions for Use*]

1. After cleansing, even out skin using a toner. Take the mask out of its package, unfold, and place the sheet on the face.

2. Rest comfortably for 10 to 20 minutes and remove the mask.

3. Remove the mask, and let the skin absorb the remaining essence by gently patting the skin.

Considering the skin's 4-week turnover term, it is most effective to use consecutively 2~3 times a week for 4 weeks.

(One-month concentrated skin management program)

##### Google Translate 1:

[使用说明]

1.洁面后，使用爽肤水均匀肌肤。从包装中取出面膜，展开，然后将面膜贴在脸上。

2.舒适地休息10-20分钟，取下面膜。

3.取下面膜，轻轻拍打肌肤，让肌肤吸收剩余精华。

考虑到肌肤4周的周转期，每周连续使用2~3次，连续使用4周最有效。

(1个月集中皮肤管理计划)

##### DeepL Translator 1:

[使用方法]。

1.洁面后，用爽肤水均匀皮肤。从包装中取出面膜，展开，并将面膜放在脸上。

2.舒适地休息10-20分钟，取下面膜。

3.取出面膜，轻轻拍打皮肤，让皮肤吸收剩余的精华。

考虑到皮肤4周的更替期，每周连续使用2~3次，持续4周，效果最好。

(一个月集中的皮肤管理计划)

##### Youdao Translator 1:

[使用说明]

1.洁面后，用爽肤水均匀肌肤。将口罩从包装中取出，展开，将面膜敷在脸上。

2.舒适地休息10-20分钟，然后摘下口罩。

3.取下面膜，轻拍肌肤，让肌肤吸收剩余精华液。

考虑到皮肤4周的周转期，每周连续使用2~3次为佳，连续使用4周。

(一个月集中护肤计划)

##### Baidu Translator 1:

[使用说明]

1.清洁后，用爽肤水均匀皮肤。将面具从包装中取出，展开，然后将其放在面部。

2.舒适休息10-20分钟，取下面膜。

3.取下面膜，轻轻拍打皮肤，让皮肤吸收剩余精华。

考虑到皮肤的4周周转期，每周连续使用2~3次，持续4周最为有效。

(一个月集中皮肤管理计划)

### QQ Translate 1:

[使用指示]

- 1.洁面后，即使使用爽肤水也是如此。把面具从包里拿出来，展开，然后把床单放在脸上。
- 2.舒舒服服10~20分钟，摘下口罩。
- 3.卸下面膜，轻轻拍拍肌肤，让肌肤吸收余下的精华。

考虑到皮肤4周的周转期，连续使用2~3次，每周使用4周是最有效的。

(一个月的集中皮肤管理课程)

### WeChat Translate 1:

[使用说明]

- 1.洁面后，使用爽肤水均匀皮肤。将口罩从包装中取出，展开，并将其放在脸上。
- 2.舒适地休息 10 - 20 分钟，取下面膜。
- 3.取下面膜，用轻拍肌肤的方式让肌肤吸收剩余精华。

考虑到肌肤的4周周转期，每周连续使用2~3次，连续使用4周最为有效。

(一个月集中皮肤管理方案)

**Analysis 1:** In the original, the words *mask* and *sheet* are the same thing, and the latter is used only to avoid repetition. The phenomenon can be readily spotted by Google Translate and DeepL Translator, which produced correct translations as shown above. Youdao Translator misidentified the first and second *mask* as “口罩” but correctly rendered “sheet” into “面膜”. Interestingly, it mistranslated the third *mask* into “口罩” again, indicating that Youdao Translator may not distinguish polysemous words. Baidu Translator identified the avoidance of repetition in the original and rendered *sheet* as “其” (it), though it failed to produce a correct translation of the first *mask*. The last two *masks* were correctly translated. Again, this suggests that Baidu Translator lacks the ability to translate polysemous words, even with context. WeChat Translate gave a similarly wrong translation of the first *mask*, and the same translations for *sheet* and the remaining two *masks*. This reveals that the effect of WeChat Translator is the same as that of Youdao Translator in this text. For the same thing, QQ Translate jocularly and disappointingly produced four versions: “面具”, “床单”, “口罩”, and “面膜”, suggesting that QQ Translate still needs to be perfected.

The translations for *rest comfortably* are as follows:

**Table 1.** The translations for rest comfortably

Google Translate	DeepL Translator	Youdao Translator	Baidu Translator	QQ Translate	WeChat Translate
舒适地休息	舒适地休息	舒适地休息	舒适休息	舒舒服服	舒适地休息

The two foreign translators, Youdao, and WeChat produced acceptable Chinese, though a better version is “舒缓”. Versions produced by Baidu Translator and QQ Translate are less satisfactory, particularly QQ. Likewise, for the translation of “Remove the mask”, all machine translators provided “取下面膜”, except QQ which turned out a wrongly collocated “卸下面膜”. Again, QQ Translate performed the worst.

For the translation of the third step, all machine translators, except WeChat Translate, produced idiomatic step-by-step Chinese “轻轻拍打皮肤”, but Youdao Translator’s “轻拍肌肤” is the most antithetical or linguistically beautiful. Interestingly, Baidu Translator and WeChat Translate turned out a similarly satisfactory translation for the “considering...” sentence. Since Chinese features top-comment (Liu, 2012), the comment “most effective” is at best relocated to the very end of the Chinese sentence and rendered as “最为有效” or even better “效果最佳”. Google Translate and DeepL Translator produced similarly good, if not better, translations. Youdao Translate omitted this key piece of information and QQ Translate’s version smacks of translationese. All these demonstrate that QQ Translate should be the last choice of machine translation.

Another thing to notice is that all the six machine translators have erroneously translated “considering the skin’s 4-week turnover term”. For one thing, “turnover” can be translated into “更新”, “交替” or “周转”; in this case, only “更新” is appropriate. For another, Chinese is more dynamic than English (Chen, 2011), which means the Chinese language uses more verbs. For this reason, the first part of the sentence should be better rendered as “考虑到皮肤更新周期为4周”, instead of “考虑到皮肤四周的...周期”.

### 3.1.2. Chinese to English

The second text is a letter replying to an inquiry about donation. It is an informative text with context and some tributary words, which would sound awkward and pretentious if translated literally into English.

#### The original 2:

尊敬的雷诺兹（Reynolds）教授：

由于鄙人亲属于6月16日抵达墨尔本，未能及时阅读您的电子邮件，现在才就您对有关工作的反馈和咨询予以回复，为此深表歉意。感谢贵校给予托尼的溢美之词、关怀备至，切盼我儿成为贵校的名誉会员。

鄙人在此保证，无论小儿是否有幸成为贵校名誉会员，鄙人都会竭尽全力为建设大学的游泳池捐款。鄙人承诺尽快捐款10万澳元，并且今后帮助解决任何超支问题。能为贵校出力，深感荣幸。此外，我还会为中国当地的儿童和老人做慈善。我们母子非常感谢您的细致服务，真诚期待您适时亲临寒舍。

#### Google Translate 2:

*Dear Professor Reynolds:*

*My apologies for not being able to read your email in time to respond to your feedback and inquiries about work due to my relatives arriving in Melbourne on June 16th. Thank you for your kind words and caring for Tony, and I look forward to my son becoming an honorary member of your school.*

*I hereby promise that no matter whether the child is fortunate enough to be an honorary member of your school, I will make every effort to donate to the construction of the swimming pool of the university. I pledge to donate A\$100,000 as soon as possible and to help with any overspending going forward. It is an honor to be able to contribute to your school. In addition, I will do charity for local children and the elderly in China. Our mother and son are very grateful for your meticulous service and sincerely look forward to your visit to the humble house in due time.*

#### DeepL Translator 2:

*Dear Professor Reynolds.*

*I apologies for not being able to read your email in time to respond to your feedback and enquiries about your work, as my relatives arrived in Melbourne on 16 June. I would like to thank you for the kind and caring words you have given Tony and look forward to my son becoming an honorary member of your school.*

*I hereby pledge to do my utmost to contribute to the building of the University's swimming pool, whether or not my son is fortunate enough to become an honorary member. I pledge to contribute \$100,000 as soon as possible and to help with any overspending in the future. It is a great honour to contribute to your university. In addition, I will also be doing charity work for the local children and elderly in China. We, mother and son, thank you very much for your careful service and sincerely look forward to your visit to our home in due course.*

**Youdao Translator 2:**

*Dear Professor Reynolds,*

*As my relative arrived in Melbourne on June 16th, I am sorry for not reading your email in time. I am now replying to your feedback and consultation on the work. Thank you for your kind words and care for Tony, and I sincerely hope that my son will become an honorary member of your school.*

*I hereby promise that I will do my best to contribute to the construction of the swimming pool of the university, regardless of whether my child is honored to be an honorary member of your university. I promise to donate A\$100,000 as soon as possible and help cover any future overruns. I feel honored to contribute to your school. In addition, I will also do charity work for local children and the elderly in China. We thank you very much for your meticulous service and sincerely look forward to your timely visit to my humble home.*

**Baidu Translator 2:**

*Dear Professor Reynolds*

*Since I arrived in Melbourne on June 16 and failed to read your email in time, I am sorry to reply to your feedback and consultation on your work. Thank you for your kind words and care. I look forward to my son becoming an honorary member of your school.*

*I hereby guarantee that I will make every effort to contribute to the construction of the University's swimming pool, regardless of whether Xiaoer has the honor to become an honorary member of your university. I promise to donate \$100000 as soon as possible and help solve any overspending in the future. It is a great honor to contribute to your school. In addition, I will do charity for local children and the elderly in China. Our mother and son thank you very much for your meticulous service, and sincerely look forward to your timely visit.*

**QQ Translate 2:**

*Distinguished Professor Reynolds,*

*As my relatives arrived in Melbourne on 16 June and were unable to read your email in time, I apologize for your feedback and advice on the work. Thank you for your kind words and care for Tony. I hope my son will become an honorary member of your school.*

*I hereby assure you that whether or not children are lucky enough to become honorary members of your school, I will make every effort to donate money to the construction of the university swimming pool. I pledge to contribute A\$100000 as soon as possible and to help resolve any overspending in the future. It is a great honor to be able to contribute to your school. In addition, I will also do charity for the local children and the elderly in China. Our mother and son are very grateful for your meticulous service and sincerely look forward to your coming to the cold house in person at the right time.*

**WeChat Translate 2:**

*Dear Professor Reynolds:*

*Due to my relative arrived in Melbourne on June 16, I was unable to read your email in time, and I am sorry for your feedback and consultation. Thank you for your kind words and care for Tony, and I hope that my son will become an honorary member of your school.*

*I assure you that I will make every effort to contribute to the construction of the University's swimming pool, whether or not my son is fortunate enough to become an honorary member of*

*your university. I am committed to contributing A\$100,000 as soon as possible and to help address any future overruns. It is a great honor to contribute to your school. In addition, I will also do charity work for children and the elderly in China. We thank you very much for your meticulous service, sincerely look forward to your visit in due time.*

### **Analysis 2:**

**Salutation.** The six translators turned out versions with nuances: Google and WeChat versions were identical, with a colon; QQ Translate rendered “尊敬的” into “Distinguished”, which in this case is stylistically wrong in English. DeepL ended the salutation with a period, and Baidu with no punctuation; neither is right in English. In highly formal situations, a salutation should end with a colon, and not-so-formal ones, with a comma (Kaufman and Straus, 2021).

**The first sentence of the first paragraph.** Google and DeepL started with a direct apology, followed by the reasons; the other four Chinese-produced machine translators all began with the reasons, inconsistent with the English discourse.

**The first sentence of the second paragraph.** Google and DeepL again produced satisfactory results, though the emphases were different. Youdao, Baidu, and WeChat used similar constructions where “whether or not” can be shortened as merely “whether”. QQ Translate mistakenly translated the archaic “小儿” into “children”. Overall, all the six machine translators, save QQ, produced at least acceptable versions.

**Translation of some nouns in the last sentences.** According to Collins English Dictionary Online, charity work and philanthropic work are the correct translations. DeepL, Youdao, and WeChat therefore outperformed the other three. “我们母子”, typical of literary Chinese, was ridiculously rendered as “Our mother and son” by Google, Youdao, and QQ translators. Though DeepL and WeChat versions were more flexible, the best one should be “my son and I”. “寒舍”, another archaic expression used in literature, or humorously in modern conversations, should be domesticated to “our home”, rather than “humble home/ house/ abode”. The QQ translate, unfortunately, rendered it Literally as cold home.

Based on the above analysis, we can safely conclude that in almost every aspect, DeepL Translator performed the best, and QQ Translate the worst. Google is the second best; the other three, not similarly acceptable.

From the above two directions of informative text, we can confirm that DeepL is the best machine translator, and Google the second best, though these two still lacks the ability to translate culture-loaded words. Baidu and WeChat are similarly good, at least better than Youdao and QQ, the latter being more so.

## **3.2. Vocative Text**

### **3.2.1. English to Chinese**

The English original is an ad for a stereo, a highly vocative text full of descriptive words and rhetorical devices. Vocative texts should be too informative, persuasive, and aesthetic (Guo, 2013).

#### **The original 3:**

*One glance is all it takes. You're at the edge of creative innovation. Where the sense blends in a sea of expressive experience—waves of lucid sound, landscapes of sensuous form, all you're your personal enjoyment. Now listen closely. At first it seems that you're in a jazz club, then a cathedral, then a cinema ...what will be the next?*

#### **Google Translate 3:**

一目了然。您处于创造性创新的边缘。感官融合在表达体验的海洋中——清晰的声音波，感性形式的风景，所有你都是你的个人享受。现在仔细听。起初，您似乎在爵士乐俱乐部，然后是大教堂，然后是电影院.....接下来会是什么？

**DeepL Translator 3:**

只要看一眼就够了。你处于创造性创新的边缘。在那里，感觉融合在表现性经验的海洋中--清晰的声音的波浪，感性的形式的风景，所有你是你个人的享受。现在仔细听。起初，你似乎是在一个爵士俱乐部，然后是大教堂，然后是电影院.....接下来会是什么？

**Youdao Translator 3:**

只需要看一眼。你处在创新的边缘。在那里，感觉融合在表达体验的海洋中——清澈的声音的波浪，感官形式的风景，所有这些都是你个人的享受。现在请仔细聆听。一开始你似乎是在爵士俱乐部，然后是大教堂，然后是电影院.....接下来会发生什么？

**Baidu Translator 3:**

只需一眼。你处于创造性创新的边缘。在这里，感觉融入了表达经验的海洋，清澈的声音，感官形式的风景，一切都是你个人的享受。现在仔细听。起初，你似乎在一家爵士俱乐部，然后是一座大教堂，然后是一家电影院。。。下一步是什么？

**QQ Translate 3:**

一瞥就够了。你正处于创造性创新的边缘。当感觉融合在一片富有表现力的海洋中--清晰的声音波，感官形式的风景，你所有的一切都是你个人的享受。现在仔细听着。一开始你似乎是在爵士乐俱乐部，然后是大教堂，然后是电影院.接下来会是什么？

**WeChat Translate 3:**

一瞥就够了。你正处于创造性创新的边缘。当感觉融合在一片富有表现力的海洋中--清晰的声音波，感官形式的风景，你所有的一切都是你个人的享受。现在仔细听着。一开始你似乎是在爵士乐俱乐部，然后是大教堂，然后是电影院.接下来会是什么？

**Analysis 3:**

**Translation of “One glance is all it takes.”** The Google version tried to unpack the meaning into “一目了然” (readily understandable), but the context suggests the stereo is visually attractive. DeepL retained the surface meaning, which is understandable but not persuasive enough. The other versions lack the information necessary for understanding.

**Translation of “You’re at the edge of creative innovation.”** Except for Youdao Translator which omitted “creative”, all the other five machine translators rendered this part into the confusing “你/您处于创造性创新的边缘”. Machine translators cannot figure out the indicative comparison with “listen closely”. Here “at the edge of” simply means the listener is very close to a stereo made out of creativity and innovation. A correct and persuasive version is at best be antithetical, using four-character words “创意不息，革新不止”.

The next sentence is highly descriptive, creating scenes of sound waves and sensuous pictures. The translation should retain the image while explicitly portraying the picture. “Where the sense blends in a sea of expressive experience—waves of lucid sound” is not just sound, but also a figurative picture of the waves in the sea. Thus a better translation may be “聆听碧海潮生”. “Landscapes of sensuous forms” is a result of the lucid sound drawing the listeners into an enthralling picture; in Chinese, we can say “体验高山流水”. In this way, the translation paints a vivid picture.

The last sentence is unsatisfactorily translated by all the six translators, which cannot think about why these pictures appear before a stereo. It is these types of music or sound played in those scenarios that are played in the stereo and therefore bring pictures to the mind. To produce a persuasive and aesthetic translation, we must explicate the characteristics of those types of music, therefore “似爵士俱乐部的纵情欢歌，似教堂的祈福吟诵，又似剧院的跌宕回响”. “What will be next” indicates there can be many other types of music that can be played by this stereo, without diminishing the quality. In other words, it means the product is superb. The

Chinese expression may be flexibly changed to “余音缭绕, 回味无穷。” in line with the Chinese context.

All in all, in this highly vocative text, all the machine translators are fiascoes since they can only translate the surface meaning, sometimes even confusingly.

### 3.2.2. Chinese to English

The Chinese original is extracted from an advertisement, which should retain the basic information and be most persuasive and aesthetic. Translation of ads should be flexible and the minimal translation unit is “paragraph” (Newmark, 2001).

#### The original 4:

1. 一个集研发、制造、销售、服务为一体的世界级家具企业。
2. 冠美家具，一个以品质为生命的企业，生产的每一道工序都秉承着精巧的技艺，每一个细节都流露着冠美人精益求精的品质追求。
3. 冠美家具，一个不断喷涌创造力的企业，以市场为导向，不断求新创新，引领时尚潮流。
4. 冠美家具，一丝不苟的追求，精益求精的执着，对高品质的恒人坚持，标准化、高效率的管理系统，赢得了世界著名品牌的广泛认同。
5. 冠美家具，带着环保、高贵、浪漫、时尚，带着温情与关爱，悄然地站在了世界的舞台！

#### Google Translate 4:

1. *A world-class furniture enterprise integrating R&D, manufacturing, sales and service.*
2. *Guanmei Furniture, an enterprise that takes quality as its life, adheres to exquisite skills in every process of production, and every detail reveals the quality pursuit of Guanmei people.*
3. *Guanmei Furniture, an enterprise that constantly spews creativity, is market-oriented, constantly seeks new innovations, and leads fashion trends.*
4. *Guanmei Furniture, with its meticulous pursuit, persistent pursuit of excellence, insistence on high-quality Hengren, and standardized and efficient management system, has won the wide recognition of world-renowned brands.*
5. *Guanmei furniture, with environmental protection, nobility, romance, fashion, with warmth and care, quietly stands on the world stage!*

#### DeepL Translator 4:

1. *A world-class furniture enterprise integrating research and development, manufacturing, sales and service.*
2. *Guanmei furniture, an enterprise that takes quality as its life, each process of production is adhering to the exquisite skills, and every detail exudes Guanmei's pursuit of excellence in quality.*
3. *Guanmei furniture, a company that constantly spurts creativity, market-oriented, constantly seeking new innovation, leading the fashion trend.*
4. *Crown Beauty furniture, the meticulous pursuit of excellence, persistence in excellence, the constant insistence on high quality, standardized and efficient management system, has won the wide recognition of world-famous brands.*
5. *Crown beauty furniture, with environmental protection, nobility, romance, fashion, with warmth and care, quietly standing in the world stage!*

#### Youdao Translator 4:

1. *A world-class furniture enterprise integrating r&d, manufacturing, sales and service.*
2. *Guanmei furniture, an enterprise that takes quality as its life, inherits exquisite skills in every process of production, and every detail reveals the pursuit of excellence in quality of Guanmei people.*
3. *Guamei Furniture, an enterprise constantly bursting with creativity, is market-oriented, constantly seeking new innovation and leading the fashion trend.*

4. Guanmei furniture has won wide recognition from world famous brands for its meticulous pursuit, persistence of lean gas refinement, persistence of high quality and standardized and efficient management system.

5. Guanmei furniture, with environmental protection, expensive, romantic, fashion, with warmth and care, quietly stood on the world stage!

#### **Baidu Translator 4:**

1. a world-class furniture enterprise integrating R & D, manufacturing, sales and service.

2. GUANMEI furniture is an enterprise that takes quality as its life. Every process of production inherits exquisite skills, and every detail shows GUANMEI's quality pursuit of excellence.

3. GUANMEI furniture, an enterprise constantly spurting creativity, is market-oriented, constantly seeking innovation and leading the fashion trend.

4. GUANMEI furniture has won wide recognition of world-famous brands for its meticulous pursuit, persistent pursuit of excellence, adherence to high-quality Hengren, and standardized and efficient management system.

5. GUANMEI furniture stands quietly on the world stage with environmental protection, nobility, romance, fashion, warmth and love!

#### **QQ Translate 4:**

1. A set of R&D, manufacturing, sales, service as one of the world-class furniture enterprises.

2. Guanmei Furniture, an enterprise with quality as its life, adheres to exquisite skills and reveals Guanmei in every detail. The pursuit of the quality of excellence.

3. Guanmei Furniture, a creative enterprise, market-oriented, constantly seeking new innovation, leading the fashion trend.

4. Guanmei furniture, meticulous pursuit, the persistence of refinement, adhere to high-quality constant people, standardized, efficient management system, has won the wide recognition of the world-famous brands.

5. Guanmei furniture, with environmental protection, nobility, romance, fashion, with warmth and love, quietly stood on the stage of the world!

#### **WeChat Translate 4:**

1. A collection of research and development, manufacturing, sales, service as one of the world-class furniture enterprises.

2. Crown Beauty Furniture, a quality of life for the enterprise, the production of each process is adhering to the delicate skills, every detail shows the crown beauty excellence quality pursuit.

3. Guanmei Furniture, a creative enterprise, is market-oriented, constantly seeking new and innovative, leading the fashion trend.

4. Crown United States furniture, meticulous pursuit, the persistence of refinement, adhere to high quality, standardized, efficient management system, won the world-famous brand wide recognition.

5. Guanmei furniture, with environmental protection, noble, romantic, fashion, with warmth and care, quietly standing on the stage of the world!

#### **Analysis:**

**The first sentence.** All the six machine translators transliterated “冠美” as “Guanmei”, except WeChat Translate which churned out four versions. “集... ...为一体” in the first sentence is almost like a slogan; all versions, however, failed to retain the slogan-like style.

**The second sentence.** Google and Youdao versions are understandable yet quite long; DeepL's version contains a logical fallacy in the middle; Baidu's version is not like a slogan; QQ's version ends up with a fragment, and WeChat even worse. Promotional writing should be short, because

the reader usually wants to know what is being promoted as quickly as possible. Also, the longer the text, the greater the cost (Ye and Shi, 2011).

**The third sentence.** Only DeepL retains the slogan-like style, and Google's syntactic structure is more English-like. The metaphor in the original was translated wrongly by Google, DeepL, and Baidu, but correctly by Youdao, QQ, and WeChat. This indicates that the western-produced machine translators may be better at dealing with syntactic levels, and the Chinese-produced ones at rendering culture-related/loaded words into English.

**The fourth sentence.** The best translator was from Youdao, which relocates the long reasons to the very end. Google put out a syntactically and grammatically acceptable sentence, but the "with" construction was stuck in the middle, as opposed to the common belief that good English writing puts the subject and object as close as possible (Willims, 1990).

**The fifth sentence.** Some adjectives do not fit well with "furniture" e.g., "noble, romantic, and fashion." Putting them together sounds very strange in English. All machine translators tried to render everything. Baidu tried to be flexible by putting the "with" part at the end, though the preposition directly modifies "stage" and is therefore wrong. The other versions are almost identical.

From the above analysis, we can conclude that machine translations follow rigidly to the original, irrespective of the register and functions of the text.

## 4. Conclusion

This study investigates the effects of six major neural machine translators (NMT) rendering four texts—E-C and C-E directions for the informative and the vocative. By comparing the errors and inadequacies, I found that DeepL is the best at translating informative texts from English to Chinese, followed by Google. Baidu, Youdao, and WeChat are similarly good, yet with confusing blunders. For C-E informative texts, Google and DeepL succeed in maintaining a native-like syntax, though they cannot render culture-loaded words. In this regard, QQ is again the least satisfactory one. For highly vocative texts, all the machine translators are fiascoes since they can only translate the surface meaning, sometimes even confusingly. For C-E vocative texts, DeepL and Google can produce acceptable sentences but retain every piece of information, thus jeopardizing the persuasiveness and aesthetics. Chinese-produced NMTs are better at dealing with culture-loaded words.

Hopefully, this paper can provide some translation tips for Chinese researchers, the latest trends in NMT for teachers and researchers of the English language, and some insights for technical personnel.

There are some limitations, too. First, this study only focuses on the typical informative and vocative texts. Future research may therefore focus on texts with both functions. Second, this paper is a preliminary experimental study without too much data. Future research may approach this field quantitatively.

## References

- [1] Chen, D. Z. *Contrastive Linguistics Between Chinese and English* [M]. Beijing: Foreign Language Teaching and Research Press, 2011.
- [2] Cheng Y., Tu, Z. P., Meng, F. D., Zhai, J. J. and Liu, Y. Towards Robust Neural Machine Translation Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics (Long Papers), pages 1756–1766 Melbourne, Australia, July 15 - 20, 2018.
- [3] Deng D. and Xue N. W. Translation Divergences in Chinese–English Machine Translation: An Empirical Investigation. *Computational Linguistics*, Vol. 43, No. 3, 2016 521-565.

- [4] Guo, X. Y. Contemporary Practical Business English Translation [M]. Beijing: University of International Business and Economics Press, 2013.
- [5] Hutchins, W. J. and Harold L. Somers An introduction to machine translation Somers. London: Academic Press, 1992.
- [6] Kaufman, L. and J. Straus The Blue Book of Grammar and Punctuation Hoboken: Jossey-Bass, 2021.
- [7] Liu, J. (2020). Comparing and Analyzing Cohesive Devices of SMT and NMT from Chinese to English: A Diachronic Approach. *Open Journal of Modern Linguistics*, 10, 765-772. <https://doi.org/10.4236/ojml.2020.106046>.
- [8] Liu, M. Q. English Varieties and Translation [M]. 2nd Ed. Beijing: China Translation & Publishing Corporation, 2012.
- [9] Munteanu, D.S., Fraser, A., Marcu, D.: Improved machine translation performance via parallel sentence extraction from comparable corpora. *Proceedings of the Human Language Technology and North American Association for Computational Linguistics Conference (HLT/NAACL 2004)*. (2004).
- [10] Newmark, P. Approaches to Translation [M]. Shanghai: Foreign Language Education Press, 2001.
- [11] Reiss, K. "Text types, translation types and translation assessment". *Trans. A. Chesterman*, in A. Chesterman (ed.) (1989), pp. 105-15.
- [12] Willims, J. Style: Toward Clarity and Grace [M]. Chicago: The University of Chicago Press, 1990.
- [13] Wu Z. L., Wei D. M., Li Z. Y., Yu Z. Z., Shang H. C., Chen X. Y, Guo J. X, Wang M. H., Lei L. Z., Tao S. M., Yang H. and Qin Y. Improved method of combining forward translation and back translation for neural machine translation[J]. *Journal of Xiamen University (Natural Science)*. 2022, 5: 1-8.
- [14] Wu, Y. H. et al. 2016. Google's Neural Machine Translation System: Bridging the gap between human and machine translation [OL]. <https://arxiv.org/abs/1609.08144> (accessed 20/10/2021).
- [15] Xiao, X. Li, S., Yu, W., Liu, J. and Liu, B. "English-Chinese translation based on an improved SEQ2SEQ model" *Computer Engineering and Science*, vol. 41, no. 7, pp. 1257-1265, 2019.
- [16] Zhao, H. J. and Lin G. B. A study on the corpus context strategies for the missing words in Machine Translation [J]. *Foreign Language Teaching and Research (bimonthly)*. 2022, 55(2): 277-287.