Reference in English-Chinese Legal Translation: Human Translators Versus ChatGPT

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Abstract

Reference is a device of grammatical cohesion; it refers to another element with the same semantic meaning; it can be categorized into personal reference, demonstrative reference, and comparative reference (Halliday & Hasan, 1976). This paper aims to delve into the grammatical cohesion in legal translation, focusing particularly on the translatability of reference in English-Chinese translation through a detailed case study. To this end, the *International Code for the Protection of Tourists* is chosen as the source text and is compared with two target Chinese translations: one by human translators and the other by ChatGPT (the fourth version). The data related to differences of reference items between English and Chinese are identified and marked. Based on Toury's (2012) framework of descriptive translation studies, the study is qualitative and is conducted on the English-Chinese translation of reference in the legal text, the human translation, and the ChatGPT's translation. The research reveals that three translation methods (literal translation, omission, and amplification) are used in translating reference items. It indicates that there are more advantages of human translators than ChatGPT in legal translation.

Keywords: reference, grammatical cohesion, English-Chinese translation, legal translation, ChatGPT's translation

1. Introduction

Cohesion "concerns how the text is constructed as a semantic edifice" (Halliday & Hasan, 1976, p. 26). It is a crucial element of discourse analysis and text linguistics applicable to translation (Newmark, 1987). A text that does not hang together firmly for readers or listeners, or that fails to reproduce cohesive links in translation, may ultimately result in misinterpretation (Shlesinger, 1995). There are two types of cohesion: grammatical cohesion and lexical cohesion; grammatical cohesion consists of reference, substitution, ellipsis, and conjunction (Halliday & Hasan, 1976). Reference refers to "the information that is signalled for retrieval" (Halliday & Hasan, 1976, p. 31). It indicates whether something is being reiterated from a prior point in the text or if it is a new concept not yet introduced in the text (Thompson, 2022). Every language has certain elements with the attribute of reference (Halliday & Hasan, 1976). The use of reference relies on language peculiarities and norms. The analysis of reference in the translation contributes considerably to the assessment of the translation quality.

In the era of globalization, the cross-border movement of people, goods, services, and capital has reshaped the legal landscape, necessitating legal professionals to interact within diverse multilingual and multicultural environments (Šarčević, 2012), which increases the demands and challenges of legal translation. Legal texts are a type of specialized communication (Stolze, 2001). Legal language has the features of "formulaicity, standardisation, petrification, and rituals" and its uses are highly patterned (Biel & Engberg, 2013, p. 5). Translating laws can present unforeseen complexities and challenges due to the potential differences in legal and linguistic traditions (Cao, 2010). Alcaraz and Hughes (2014) notice the frequent use of indefinite pronouns in legislative documents and stress the importance of examining text at the textual level. Maintaining textual cohesion is crucial in legal communication, and various techniques and reference devices are needed to guarantee suitable cohesion (Ross & Magris, 2017).

Machine translation is increasingly participating in translation practice. Ensuring coherence and fluency is a challenge that machine translation grapples with (Lyu et al., 2023a). Since the publication of ChatGPT by OpenAI in 2022, this cutting-edge natural language processing model has garnered interest from all around the world with more than 100 million users (Lyu et al., 2023b). With the introduction of the fourth-generation engine, ChatGPT's translation performance has been greatly improved even for far-off languages (Jiao et al., 2023). It has the potential to develop into a fresh and attractive paradigm for document-level translation (Wang et al., 2023), and demonstrates superiority in providing feedback on reference cohesion in the Chinese-English translation (Cao & Zhong, 2023). This indicates that ChatGPT can analyze reference during the translation process, but whether ChatGPT can be fully compared to human translators in legal translation still needs further research.

Therefore, this study probes into the reference in English-Chinese legal translation through a case study by comparing the source text with two target texts. The corpora include the *International Code for the Protection of Tourists* published by the United Nations World Tourism Organization (UNWTO) and its human-translated Chinese version published by UNWTO alongside another Chinese version translated by ChatGPT with the fourth-generation engine (GPT-4). Halliday and Hasan's (1976) cohesion theory and Toury's (2012) framework of

descriptive translation studies (DTS) underpin the investigation. The study operates on the hypotheses that English and Chinese differ in terms of reference and that human translators and GPT-4 exhibit distinct behaviors in English-Chinese reference translation. The study centers on the grammatical cohesive device of reference in English and Chinese and poses the following questions:

1) How is reference in English legal texts translated into Chinese?

2) How does the translation quality of reference in legal texts between human translators and GPT-4 vary?

The research aims to accomplish the following objectives:

1) to investigate English-Chinese translation methods of reference in legal texts;

2) to contrast English-Chinese translation quality of reference in legal texts between human translators and GPT-4.

2. Literature Review

2.1 Theoretical Framework

Halliday and Hasan (1976) consider cohesion as the textual quality, which is characterized by the semantic links between lexical elements and grammatical structures. As one of the grammatical devices, reference provides a basis for comparison and a participant or situational component that is mentioned in the text might be used as a point of reference for subsequent events (Halliday & Matthiessen, 2021). According to the different uses, reference items can be situational exophoric items or textual endophoric items; endophora may be anaphoric or cataphoric; the whole relations are shown in Figure 1.
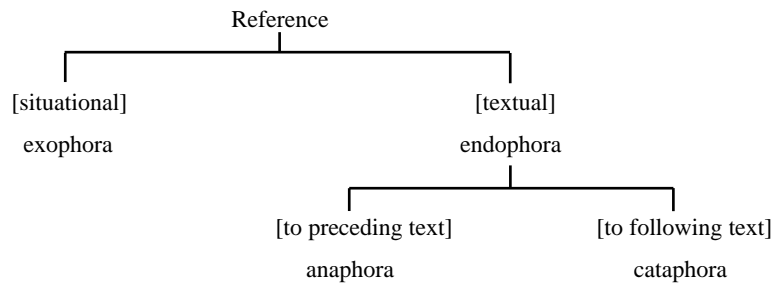
Reference

[situational]   [textual]

exophora   endophora

[to preceding text]   [to following text]

anaphora   cataphora

Figure 1. Types of cohesive reference (Halliday & Hasan, 1976, p. 33)

Exophora refers to "a thing as identified in the context of situation", which cannot be interpreted without the context (Halliday & Hasan, 1976, p. 32). For example, given "Did Mary feed those dogs?", it is possible that "those dogs" are present in the environment where the dialogue is taking place. The interpretation of "those dogs" depends on the context. Endophora refers to "a thing as identified in the surrounding text", which relies on the surrounding text to be interpreted (Halliday & Hasan, 1976, p. 32). For example, in the text "The ring is beautiful. That must have cost a lot of money.", "that" refers to "the ring", which is an endophoric item. Endophora can be further classified into anaphora (referring to the preceding text) or cataphora (referring to the following text). Compared with exophora, endophora plays a more significant role in the cohesion of texts. The present research deals with text analysis and thus focuses on endophora.

Halliday and Hasan (1976) point out that in English, there are three types of items for reference: personals, demonstratives, and comparatives. Personal reference involves referring to someone or something based on their role within a speech situation, using the category of person; personals "includes the three classes of personal pronouns, possessive determiners, and possessive pronouns" (Halliday & Hasan, 1976, p. 43). Demonstrative reference is a way of referring to something by indicating its position on a scale of closeness or distance; demonstratives like "this, these, that, those, and the" indicate the location of an object (Halliday & Hasan, 1976, p. 58). Comparative reference is an indirect form of reference that relies on identity or likeness; comparative items operate within both noun and adverbial phrases, and they enable comparisons based on general attributes like identity, similarity, and contrast, as well as specific qualities and quantities (Halliday & Matthiessen, 2021). The examples of reference items of three types are listed in Table 1. The authors identify referential relations and mark the reference items based on this classification of reference types.

Table 1. The principal categories of reference items in English (adapted from Halliday & Matthiessen, 2021, pp. 556, 561)

Types	Reference items
Personals	he, him, his, she, her, hers, it, its, they, them, their, theirs, etc.
Demonstratives	this, these, that, those, here, there, now, then, the, etc.
Comparatives	same, equal, identical, identically, just as, as, similar, additional, such, so, likewise, similarly, other, different, otherwise, else, differently, more, fewer, less, further, bigger, better, so/as... numeral, so/as/more/less...adj., so/as/more...adv., etc.

Gideon Toury (2012) introduces a three-phase methodology for systematic descriptive translation studies, which are: (1) situating the text within the target culture system, (2) textual analysis of the source text and the target text, and (3) generalizations. The second phase, textual analysis, is the approach followed in this study. It sheds light on the actual translation practices instead of dictating translation methods. The source text and the target text are compared to identify translation phenomena and relationships between corresponding segments, coupled pairs, which lead to the identification of translation shifts, which can be obligatory and non-obligatory (Toury, 2012).

2.2 Related Studies

Reference has been regarded as a valuable perspective in many aspects of translation studies, such as translation quality evaluation, comparison between human translation and machine translation, translation shifts, etc. Al-Qinai (2000) develops a model for translation quality assessment using objective parameters of textual typology, formal correspondence, thematic coherence, reference cohesion, pragmatic equivalence, and lexico-syntactic properties and tests it on the English-Arabic translation of advertising texts. The study discovers that compared with the most cohesive device of anaphoric reference in the English source text, the target Arabic text employs more pronouns affixed to verbs, adjectives, and nominals to indicate grammatical agreement. Voigt and Jurafsky (2012) explore the reference of literary and news texts, comparing the Chinese source texts with their English translations by human translators and machine translation. The results suggest that literary texts employ more reference chains than news texts, and Google Translate falls short in preserving literary reference than its human counterparts. Károly (2014) looks into the shifts of reference in Hungarian-English news translation using a parallel corpus. The study articulates perspectives on the behavior of referential cohesion in translation and how two distinct language systems impact it. Moindjie (2015) investigates the behavior of reference in translating from Arabic into English and French in literary texts. The findings indicate that reference in translation relies on language peculiarities and English is more cohesive in translation than Arabic and French. He further conducts a case study of personal reference in translation between French and English. The results show that the English language employs more cohesive personal reference than the French language because the English language is more concrete and succinct while the French language is more abstract and prolix (Moindjie, 2019). He also explores the function and manipulation of demonstrative reference in French-English translation. The study suggests that the mechanisms of certain translation shifts and the translation methods for demonstrative reference are influenced by specific language characteristics and preferences of French and English (Moindjie, 2023). Orang'i (2022) delves into referential cohesion in the translation of English-Swahili healthcare texts, aiming to elucidate its application and determine potential variations in translation. The findings reveal that both the source and target texts predominantly use personal and demonstrative references, with the Swahili translations containing a higher number of reference items compared to the original English texts. These studies validate that reference as a cohesive device in translation can reveal various language peculiarities and offer insights into translation methods in different text types.

The importance of cohesion in legal translation is increasingly being recognized by scholars. Drawing on the cohesion model formulated by Halliday and Hasan, Pan (2014) explores the role of conjunctions in maintaining the logical flow of information in legal documents. Through a corpus-based analysis, Pan contrasts the conjunctive patterns between two legal subgenres: prospectuses and legislative texts. The results show that conjunctives frequently become implicit in prospectus translations but become explicit in legislative text translations. Based on a functionalist framework, Ross and Magris (2017) discuss the translation quality and functionality of the European Arrest Warrant between Belgian Dutch and Italian. They discover that Romance languages favor the use of anaphoric pronouns, whereas German languages often prefer lexical repetitions both in standard language and legal varieties. This finding shows that the two languages differ greatly in the use of reference. Phelan (2017) undertakes a case study to evaluate the aptness of the American Translators Association framework for legal translation assessments. He notes that "a cohesion error occurs when a text is hard to follow because of inconsistent use of terminology, misuse of pronouns, inappropriate conjunctions, or other structural errors" and translation assessors emphasize identifying cohesion errors (Phelan, 2017, p. 193). Pungă and Ungurean (2022) also utilize the American Translators Association's system to evaluate the translation quality of a criminal conclusion from Romanian into English and a cohesion error is detected in their analysis. Cohesion is a crucial aspect in evaluating the quality of legal text translations, but investigations of English-Chinese translations of legal texts specifically regarding reference are scant. As such, this study strives for a novel exploration to generate English-Chinese translation methods of legal texts and assess the translation quality between human translators and GPT-4 in the aspect of reference.

3. Methods

This research is a case study on reference in English-Chinese legal translation. The reason for choosing English and Chinese languages is that legal translations between English and Chinese are not only abundant but also complex due to their distinct linguistic, cultural, and legal traditions. Saldanha and O'Brien (2013) point out that "one might wish to randomly select sentences from a large corpus of text, or it may be more appropriate to select coherent passages of text, or text that demonstrates specific linguistic features" (p.105). Considering the research value and authority of the text, the research sampling to be used is purposive in that the selected texts are texts that "can best provide information to answer the research question" (McGregor, 2018, p. 268). Therefore, the researchers selected the *International Code for the Protection of Tourists* and its two Chinese translations by human translators and GPT-4 as the corpora for this study. The abbreviations that are used are ST, HT, and GT. ST stands for the English source text published by UNWTO (https://doi.org/10.18111/9789284423361); HT stands for the human-translated Chinese text published by UNWTO (https://doi.org/10.18111/9789284423521); GT stands for GPT-4-translated Chinese text produced by authors (the website: https://openai.com/research/gpt-4; the time: September 2023; the place: Penang, Malaysia).

The investigation is based on Halliday and Hasan's (1976) theory on cohesion and Toury's (2012) DTS. To capture disparities in reference across two languages, data are gathered manually through a four-step procedure (see Table 2) because "the use of semantic and discourse tagging is also becoming more common, but it is still done mainly manually" (Saldanha & O'Brien, 2013, p. 78). Firstly, referred objects and their corresponding reference items are identified in the ST. Secondly, different reference items between the ST and HT are identified through a comparative approach. Thirdly, GT is produced and different reference items between the ST and GT are identified. Due to the word limit in GPT-4's chat interface, referred words and their referents from the ST appear on the same page; the ST is translated into

Chinese by GPT-4 page by page. During the translation process, the researchers preface each page of the ST in the GPT-4 chat window with the directive "Translate the legal text into Chinese:". This serves to cue GPT-4 regarding the specialized nature of the text, ensuring that the translation aligns with the legal context. Besides, for consistency and coherence of the ST, if the page's final paragraph is incomplete, its continuation from the next page is appended, creating a full paragraph for translation. Authors found that when inputting the same source text, GPT-4 sometimes changes its translations. Therefore, GPT-4 translations are based on the first translated version. Fourthly, data from ST, HT, and GT are classified and described, and varying translation methods are concluded. Qualitative analysis is conducted on the semantic relations of reference, English-Chinese translation methods of reference, and translation quality of HT and GT.

Table 2. The procedure of data collection

Steps	Data	Data collection
Step 1	all reference items in the ST	Authors identify words of reference and their referred objects by reading the entire ST.
Step 2	different reference items of ST and HT	Authors mark different words of reference in the ST and the HT by comparatively reading ST and HT.
Step 3	different reference items of ST and GT	Authors translate ST into Chinese by GPT-4 to get GT. Authors mark different words of reference in the ST and the GT by comparatively reading ST and GT.
Step 4	classification of reference items of HT and GT	The marked words of reference in HT and GT fall into different types according to their different translation methods.

4. Results

By comparing ST with HT and GT, the authors identified three methods of translating references in legal texts from English to Chinese: literal translation, omission, and amplification. Their uses are concluded in Table 3. Firstly, literal translation conveys the basic meaning of reference items and is the most commonly used method for translating them. Due to the formal feature of legal language, translators should choose vocabulary that aligns with a formal style rather than colloquial expressions. Moreover, when dealing with reference items, translators need to opt for cohesive ties that naturally cohere with other words according to the linguistic conventions and context of the target language. Secondly, omission means not translating the reference items. The method of omission is employed because leaving out the reference items can make the translation concise without altering the original meaning, or because changes in sentence structure are required to make the translation more fluent. Thirdly, amplification means rendering reference items by adding the meanings of the objects being referred to or directly using the meanings of the referred objects. Using the amplification method can add information to the reference items to increase the coherence of the target texts. In texts with multiple and complex referential relations, it can help readers clarify these relations quickly, thereby reducing the difficulty of understanding the translation.

Table 3. English-Chinese translation methods of reference items in legal texts

Translation methods	Explanations	Situations of uses
Literal Translation	Translate reference items with formal words, such as "其", "该", "本", or "此" rather than "它们的", "这样的", "这个" or "这次"; Translate the text in a manner that conforms to the linguistic habits and context of the target language.	Translators adopt this method when rendering most reference items.
Omission	Do not translate reference items.	Translators adopt this method when literal translations of reference items are redundant or when the sentence structure of the translated text is changed and the omission of reference items cannot change the meaning of the ST.
Amplification	Translate reference items by adding the meanings of referred objects or substituting them with the meanings of referred objects.	Translators adopt this method when literal translations of reference items lead to difficult understanding or misunderstanding of the ST, whereas adding the meanings of referred objects contributes to the understanding of the target texts.

Both human translators and GPT-4 are capable of recognizing referential relations and employing different translation methods (see Table 4). In total, there are 135 personals, 1131 demonstratives, and 234 comparatives in ST. The translation differences regarding the reference of three types between HT and GT are as follows: 70 in personals, 12 in demonstratives, and 15 in comparatives. The difference rates of reference translation between HT and GT are about 52% in personals, 1% in demonstratives, and 6% in comparatives. Overall, human translators and GPT-4 tend to translate demonstratives and comparatives similarly but diverge largely in rendering personals. Besides, the quality of translations produced by human translators surpasses that of GPT-4. Human translators have advantages over GPT-4 in five aspects. Firstly, compared to human translators, GPT-4 makes translation errors in reference translation. Legal language is very precise, so changes in sentence structure can lead to changes in liability. In translation, GPT-4 has a problem of excessive reduction of content that makes the division of responsibility between parties unclear. Secondly, human translators are better at using formal words in the translation

of reference items than GPT-4. The formality of legal language embodies the authority and precision of law, so translators should strive to use formal expressions in legal translation. The result shows that GPT-4 uses common meanings of words more frequently than human translators. Thirdly, GPT-4 is inferior to human translators in learning Chinese language norms. Language norms provide accepted standards and guidelines for effective communication, and legal language should conform to the norms to maintain clarity, consistency, and coherence. Human translators are more proficient than GPT-4 in learning habitual juxtaposition of words in the Chinese language. Fourthly, GPT-4 is less intelligent than human translators in generating appropriate expressions when choosing the same translation methods. Referential relations of translations can vary in strength and the repetition of meanings can build the strongest connection between a referent and the object being referred to. Human translators are better in lexical choices to repeat meanings than GPT-4. Fifthly, GPT-4 is less flexible than human translators in choosing proper translation methods. When several referential relations closely appear in the text, translators should reduce the understanding difficulties of the target texts as much as possible. Occasionally GT is difficult to understand due to the dense similar translations of reference items. Human translators choose translation methods more properly and flexibly than GPT-4.

Table 4. The number of translation differences regarding reference of three types between HT and GT

Reference types	Total numbers in ST	The frequencies of different translations between HT and GT	The rates of different translations between HT and GT
Personals	135	70	52%
Demonstratives	1131	12	1%
Comparatives	234	15	6%

5. Discussions

5.1 English-Chinese Legal Translation Methods of Reference

The conclusion of the translation differences between HT and GT is based on all the data related to reference and examples are parts of the data. All the data in the examples are displayed in bold type. In terms of three legal translation methods of reference, literal translation is explained by the first two examples, omission is demonstrated by the third example, and amplification is illustrated by the fourth example.

ST: Assisting the international tourist to contact the consumer agencies and authorities available in the host country and **their** international networks to help clarify the legal situation and rights of the international tourist (World Tourism Organization [UNWTO], 2022a, p. 14);

HT: 协助国际游客联系目的国的消费者代理机构和有关当局及**其**国际网络，以帮助厘清国际游客的法律状况和权利(World Tourism Organization [UNWTO], 2022b, p. 14)。

GT: 协助国际游客联系东道国及**其**国际网络中可用的消费者机构和当局，以帮助澄清法律状况和国际游客的权利。

In the ST, "their" refers to "the consumer agencies and authorities", so it is a personal reference item. Both human translators and GPT-4 translate "their" into "其". The meaning of "their" in the English-Chinese dictionaries is "他们的", "她们的", or "它们的". "其" is a formal word to express the above possessive relations or to state the identification of one or more people or organizations, which is more appropriate in the legal text type. The same translation of "其" by human translators and GPT-4 suggests that they understand the requirement of formal language in legal translation and adopt the literal translation method.

ST: Final price of the services inclusive of taxes and, where applicable, all additional fees, charges and other costs or, where **those** costs cannot reasonably be calculated in advance of the conclusion of the contract, an indication of the type of additional costs which the tourist may still have to incur and, where applicable, the right to withdraw from the contract in case **those** additional costs are substantial or unreasonable (UNWTO, 2022a, p. 20);

HT: 服务的最终含税价格和（如适用）所有额外费用、收费及其他成本，或在商定合同之前无法合理计算**这些**成本的情况下，指明游客可能仍需承担的额外费用的类型，以及（如适用）如果**这些**额外费用过多或不合理，游客有权退出合同(UNWTO, 2022b, p. 20)；

GT: 包括税费在内的服务的最终价格，以及（如适用）所有额外的费用、收费和其他费用，或者，如果**这些**费用无法在合同签订之前合理计算，则指示旅客可能还需承担的额外费用的类型，以及（如适用）在**这些**额外费用过高或不合理的情况下退出合同的权利;

In the ST, "those cost" refers to "taxes and all additional fees, charges and other costs" and "those additional cost" refers to "additional costs which the tourist may still have to incur", so two "those" are two demonstrative reference items. Similarly, human translators and GPT-4 translate two "those" in the ST into two "这些". This shows both of them refuse to use "那些", the common translation of "those" in dictionaries like Oxford or Collins. "那些" means people or things at a distance, whereas "这些" indicates nearby people or things. Compared to "那些", "这些" emphasizes the close relation between the referred item and the referent, making the sentence more cohesive and understandable for the target readers. It demonstrates that both human translators and GPT-4 can employ the literal translation method according to the Chinese language norm.

ST: "Country of origin" means the Member State of which the tourist has nationality or where at the time of the unavoidable and extraordinary circumstance or the emergency situation the tourist has **his/her** principal and

permanent residence (UNWTO, 2022a, p. 7).

HT: "客源国"指游客国籍所在成员国，或当不可避免和特殊的情况或紧急情况发生时，游客的主要永久居留权所在成员国(UNWTO, 2022b, p. 7)。

GT: "原籍国"指旅游者具有国籍的成员国，或在不可避免和特殊情况或紧急情况时，旅游者的主要和永久居住地所在的地方。

In the ST, "his/her" refers to "the tourist" in the same clause, so "his/her" is a personal reference item. Human translators and GPT-4 translate the clause "the tourist has his/her principal and permanent residence" into the phrase "游客的主要永久居留权所在" and "游客的主要和永久居住地" respectively. There are no translations of "his/her" in the HT and GT, so human translators and GPT-4 use the omission translation method. This is because the clause structure in the ST is compressed into a phrase in the HT and GT to ensure sentence fluency and the ellipsis of referential relations will not impede the delivery of key information. It is acceptable and sensible to adopt the omission method of reference items when the human translators and GPT-4 give priority to the logic to change the structure and omit the unimportant referential relations.

ST: This information should be provided in the language of the contract and, as much as possible, in additional languages, insofar as **these** may facilitate effective communication with the specifically targeted tourists (UNWTO, 2022a, p. 26).

HT: 以上信息应以合同语言以及尽可能用其他语言提供，只要**这些语言**可促进与特定目标游客的有效沟通(UNWTO, 2022b, p. 26)。

GT: 这些信息应以合同的语言提供，并尽可能以其他语言提供，只要**这些语言**可能有助于与特定目标旅客进行有效沟通。

In the ST, "these" refers to "additional languages", so it is a demonstrative reference item. Both human translators and GPT-4 translate "these" into the same expression "这些语言" rather than its literal meaning "这些". Compared to "这些", "这些语言" adds "语言" which means languages and is part of the meaning of the referred item "additional languages". This is the amplification translation method. It stresses the connection between the referent "these" and the referred item "additional languages" by giving repeated information to enhance the cohesiveness of the sentence. It reveals both human translators and GPT-4 stand by target readers by intentionally adding the meaning of referred objects into the translation of reference items to reduce the difficulty of translated texts.

5.2 Translation Quality Contrast Between Versions by Human and GPT-4

Regarding translation quality of reference in legal texts, the five advantages of human translators over GPT-4 are presented by the following five examples.

ST: "Unavoidable and extraordinary circumstances" means a situation beyond the control of the party who invokes **such** a situation and the consequences of which could not have been avoided even if all reasonable measures had been taken (UNWTO, 2022a, p. 7).

HT: "不可避免和特殊的情况"指超出援引**此种**情况的一方的控制能力、即使采取了一切合理措施仍无法避免其后果的情况(UNWTO, 2022b, p. 7)。

GT: "不可避免和特殊情况"指一方无法控制的情况，即使采取了所有合理的措施，也无法避免其后果。

This example shows that GPT-4 makes a translation mistake. In the ST, "such a situation" refers to "a situation beyond the control of the party", so "such" is a comparative reference item. Human translators translate "such" into "此种" rather than its meanings of "这样的", "那样的", or "类似的" in the dictionaries, because "此种" that means the type already mentioned is a formal expression. The translation "此种" indicates human translators realize the legal text type and attempt to render the content by literal translation in a formal language. In contrast, GPT-4 omits not only the reference item "such" but "who invokes such a situation" in the GT. It shows that for GPT-4, "a situation beyond the control of the party who invokes such a situation" is equal to "a situation beyond the control of either of the party", which is false because the former implies the other party has the responsibility to control the situation while the latter means the other party does not have this obligation. Due to weakening the liability of the other party, GPT-4's omission of the whole attributive clause of "party" is a translation mistake. Compared with GT, HT delivers a closer semantic meaning of ST by keeping a similar syntactical structure of ST.

ST: The responsibility of international tourists to either acquaint themselves or to follow the information provided by the tourism service provider regarding the characteristics of the countries **they** are preparing to visit (UNWTO, 2022a, p. 11).

HT: 国际游客有责任自行了解或根据旅游服务提供者提供的信息了解**其**准备前往国家的特点(UNWTO, 2022b, p. 11)。

GT: 国际旅游者有责任了解或遵循旅游服务提供者提供的有关**他们**准备访问的国家的特点的信息。

This example describes GPT-4's language is not formal enough. In the ST, "they" refers to "international tourists", so "they" is a personal reference item. "They" is translated into "其" and "他们" by human translators and GPT-4 respectively. Both "其" and "他们" mean

people, animals, or things that have already been mentioned, but "其" is better than "他们", in that "其" tends to be used in formal discourse and conforms to the linguistic feature of legal texts. Therefore, human translators outperform GPT-4 in using formal words in the translation of legal texts.

ST: "Host country" means the Member State on the territory of which an unavoidable and extraordinary circumstance, or an emergency situation has occurred or has **its** consequences (UNWTO, 2022a, p. 7).

HT: "目的国"指在其领土上发生了不可避免和特殊的情况或紧急情况、或产生了**相应**后果的成员国(UNWTO, 2022b, p. 7)。

GT: "东道国"指发生不可避免和特殊情况或紧急情况的成员国，或产生**其**后果的领土。

This example indicates that GPT-4 cannot fully master Chinese language norms. In the ST, "its" refers to "an unavoidable and extraordinary circumstance or an emergency situation", so it is a personal reference item. Human translators and GPT-4 translate "its" into "相应" and "其" respectively. "相应" means being corresponding and connected, whereas "其" means belonging to one or more things or persons. "其" is more common than "相应" in the translation of "its", but "相应后果" is more natural than "其后果" as an attributive modifier in the Chinese language. This implies that human translators give priority to target language norms and endeavor to avoid translationese, while GPT-4 tends to adopt the common translation of reference items and consider less in the collocation relations between reference items and the words they modified. Though both reference translations of "its" in the HT and GT are acceptable, human translation demonstrates a higher understanding of the Chinese language norms than translation of GPT-4.

ST: Cancellation rights, including withdrawal conditions, penalties, if applicable, and the right to terminate the contract without paying any termination fee in the event of unavoidable and extraordinary circumstances or an emergency situation that renders the delivery of the services impossible or substantially different to **those** provided for in the contract (UNWTO, 2022a, p. 25);

HT: 取消权，包括退出条件、违约金（如适用），以及在不可避免和特殊的情况或紧急情况导致服务不可能履行或与合同规定的**服务**有实质性不同的情况下，不支付任何终止费用而终止合同的权利(UNWTO，2022b, p. 25)；

GT: 取消权利，包括撤销条件、（如适用）的罚款和在无法避免和特殊情况或紧急情况下终止合同而不支付任何终止费用的权利，这使得服务的交付变得不可能或与合同中规定的**内容**大不相同；

This example demonstrates the referential effect of GPT-4's expression is not strong enough. In the ST, "those" refers to "services", so "those" is a demonstrative reference item. Human translators and GPT-4 translate "those" into "服务" and "内容" respectively. The literal meaning of "those" is "那些" in the dictionary. Both human translators and GPT-4 do not use "那些" for they consider "那些" is weak in rendering the referential relation and "服务" or "内容" can provide more information. Therefore, human translators and GPT-4 both employ the translation method of amplification similarly. "服务" in the HT means services which is the meaning of the referent "those", whereas "内容" in the GT means content that describes the feature of "those". Even though both of them more clearly connect "those" with "service" than "那些" does, the former is better than the latter, in that the meaning of content is wider than service and the cohesive effect of vocabulary repetition is the strongest. It can be seen despite choosing the same translation method, GPT-4's word selection is not as appropriate as human translators.

ST: By adhering to the Code fully or partially, States will undertake to:

ii. Make their best efforts to integrate **its** principles and recommendations into **their** relevant policies, legislation and regulations, and use the Code as a point of reference for enhancing, improving or supplementing **their** national laws and regulations, to the extent that this is considered appropriate with regard to specific tourism services (UNWTO, 2022a, p. 41);

HT: 如全部或部分遵守本守则，各国将承诺：

2. 尽最大努力将**本守则**的原则和建议纳入**本国**相关政策、立法和规定，并在就特定旅游服务而言适当的程度，将本守则作为加强、完善或补充**本国**法律法规的参照依据(UNWTO，2022b, p. 41)；

GT: 完全或部分地遵守本守则的国家将承诺：

ii. 尽最大努力将**其**原则和建议整合到**其**相关政策、法律和法规中，并将本守则作为增强、改进或补充**其**国家法律和法规的参考点，只要这被认为是针对特定旅游服务而言是适当的；

This example reveals human translators can choose a more suitable translation method regarding reference. In the ST, the word "its" refers to "the Code"; two words "their" refer to the same word "States"; "its" and two "their" are personal reference items. "Its" is translated into "本守则" and two "their" are translated into two "本国" by human translators, while "its" and two "their" are translated into three "其" by GPT-4. The literal meaning of "its" is "它的" and the literal meaning of "their" is "他们的", "她们的" or "它们的". In the GT, "其" is a formal word to clarify referential relations of possessive pronouns, so it is right to use "其" as the translation of "its" or "their". This shows that GPT-4 adopts the literal translation method of reference items. In the HT, "本守则" means this Code and is the meaning of the referred object of "its"; "本国" means the States and is the meaning of the referred object of two "their". This indicates human translators utilize the translation method of amplification, which is different from GPT-4's method. Translations of these three

reference items by human translators and GPT-4 are both correct, but their understanding difficulty is different. For target readers, understanding the concepts of "本守则" and "本国" is easier than distinguishing three referents "其". It shows human translators can choose more appropriate translation methods than GPT-4 to help target language readers reduce comprehension difficulty.

6. Conclusion

Based on Halliday and Hasan's (1976) theory of reference and Toury's (2012) DTS, this study investigates the English-Chinese translation of reference in a legal document, the *International Code for the Protection of Tourists*, and its two versions by human translators and GPT-4. The research has verified the hypotheses that English and Chinese differ in terms of reference, and there is a distinction between human translation and machine translation when it comes to translating references between the two languages. Translators' decisions on the referential relations expressed in legal language can vary. As far as translation of reference of legal texts is concerned, translators need to consider not only the characteristics of legal language such as formality, conciseness, and precision but also the peculiarities of the target language and its cultural connotations. To maintain the original text's semantic meaning as much as possible, translators should establish strong reference ties and clarify referential relations, especially complex ones, to avoid unclear and erroneous translations.

In terms of the research results, three English-Chinese translation methods of reference items have been identified: literal translation, omission, and amplification. Besides, the study demonstrates that both human translators and GPT-4 can identify referential relations and utilize various translation techniques. Demonstratives and comparatives are handled similarly, but personals are handled in a different way. Human translators excel over GPT-4 in terms of accuracy, use of formal languages, understanding of the target language norms, selection of appropriate expressions, and application of the right translation methods. Therefore, users of ChatGPT should refrain from solely relying on its translation due to its limitations in maintaining cohesion and ChatGPT designers need to enhance its translation capabilities in this regard.

For future studies in English-Chinese legal text translation, the determinants of translation shifts concerning reference can be further explored. The factors that bring about translation shifts in different types of reference should be determined. Besides, it is essential to encompass a broader range of textual materials and include other cohesive devices to enrich the research corpus and to get more universally applicable findings in the cohesion of legal translation.

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