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Language contact and translation: dependency relations as a lens for source language influence in fiction

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Abstract

Recognising translation as a site of language contact, this study utilises measures of dependency relations, namely dependency distance and dependency direction, to examine the influence of the source language in translation and how this influence is shaped by directionality and language pair. The data was obtained from a large-scale bidirectional multilingual corpus of original fiction and its translation across ten language pairs, with English serving as either the source or the target language in each pair. The findings reveal a balanced presence of source language influence in both translation directions, as shown by the patterns in variation of the mean dependency distance. However, this influence was not observed across all language pairs, which suggests that its manifestation was affected more by language pair than by directionality. At the same time, this study identifies a tendency for the characteristics of the translated fiction's dependency direction to align with the word order convention of the target language, indicating that the influence of the source language is limited. Additionally, this study found that simplification, a widely recognised "translation universal", may not be a unique property of translational language. Rather, it results from language contact, where the linguistic properties of the source language permeate the target language, causing the latter to reflect structural features of the original text.
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Keywords: Source language influence; Language contact; Translation universals; Directionality; Dependency relations

1. INTRODUCTION

Language contact describes a phenomenon in which two or more languages encounter each other, leading to the borrowing of words, grammatical structures, and other linguistic features between the languages involved (Heine and Kuteva, 2005). Translation, as a type of bilingual language processing activity, can be regarded as a language contact event (Kotze, 2020; Kranich, 2014). During the translation process, certain features of the source language may leave their mark on the target language system. In such cases, the target language, which is the output of the translation

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process, "reflects a mirror image of the source language" (Teubert, 1996: 247). Toury (1995) referred to this phenomenon as interference. The introduction of linguistic variation into the target language due to the influence of the source language has gained increasing attention from scholars, particularly with the rise of research investigating the unique properties of translational language. These properties are often described as "translation universals" (Baker, 1993) or the "third code" (Frawley, [1984] 2000). Most studies in this area adopt a corpus-based monolingual comparative approach, modelling the linguistic features of translational language against those of other language varieties in order to identify patterns that are unique to the former (Baker, 1993; Laviosa, 2002; Tirkkonen-Condit, 2002). In addition to the manifestation of interference, also known as "shining through" (Hansen-Schirra, 2011; Teich, 2003), other widely examined properties may include simplification, normalisation, explicitation, and conservatism (Blum and Levenston, 1978; Laviosa, 2002; Tirkkonen-Condit, 2002).

While contact linguistics provides useful frameworks for studying translation, research that explicitly examines translation as a language contact event is rather limited in quantity. Most studies that examine the phenomenon of language contact concentrate on face-to-face interaction and investigate how languages influence each other via direct spoken exchanges (Myers-Scotton, 2002). Less attention has been given to translation, an area in which language contact takes place through the written medium. At the same time, although interference is identified as a result of source language influence in translation, this phenomenon has not been thoroughly explored from the perspective of language contact. Most existing studies focus on how the manifestation of interference contributes to understanding translation as a unique language variety, attributing its occurrence to socio-cognitive factors such as the translator's style and strategies (Baker, 2000; Boase-Beier, 2020; Chou and Liu, 2024). There is a lack of discussion on how the occurrence of source language influence is related to translation as a contact event, and on its implications for understanding the broader dynamics of linguistic interaction and change within cross-lingual contexts. This gap highlights the need for further research that explicitly investigates how translation is shaped by the interplay of source and target languages.

Against this backdrop, the present study sets out to explore the manifestation of source language influence on translational language from the perspective of language contact. Unlike previous research that has typically examined isolated lexico-grammatical features and demonstrated their interference in a single translation direction for a specific language pair (Cappelle and Loock, 2013; Dai and Xiao, 2011), this study adopts dependency-based measures, namely dependency distance and dependency direction (Liu, 2008, 2010), to systematically detect the manifestation of source language influence across multiple language pairs and, at the same time, take into account the effect of translation direction. The data used in this study was drawn from a multilingual bidirectional parallel corpus of original works of fiction and their translations. Specifically, this study will explore how the dependency characteristics of the source language may manifest themselves in the target language, how directionality and the particular language pair affect their manifestation, and how the manifestation of source language influence is implicative of translation as a site of language contact and a unique language variety.

2. LITERATURE REVIEW

2.1. Language contact and translation

Translation can play a crucial role in language contact, as it can serve as a conduit for the permeation of certain linguistic features of the source language into the target language over time (Heine and Kuteva, 2005). Studies have shown that during the translation process, the presence of the source language not only introduces new vocabulary to the target language system but also influences the translator's syntactic and pragmatic choices (Kahane, 1986; Kranich, 2014; Matras, 2020). Among these, calquing or loan translation emerges as a prominent avenue through which the target language may undergo structural transformations (Bergh and Ohlander, 2017; Bullock et al., 2021). Backus and Margreet (2009) differentiated loan translation from other contact-induced phenomena, viewing it as a synchronic process that encompasses both structural interference and insertional code-switching. Similarly, Aĭkhenval′d (2002), in a study of language contact among indigenous languages spoken in the Amazon region, observed that grammatical features of Tariana were replicated in Tucano during the translation process.

When examining source language influence in translation, some researchers have found that the extent of this influence may be affected by the relative social status of the source and target language pair (Eskola, 2004; House, 2011). Many studies have focused on the influence of English as a source language and its role in a variety of language contact situations. For instance, Pang and Wang (2020), in a diachronic study investigating the influence of English on vernacular Chinese during the twentieth century, demonstrated that English had increasingly interfered with translated Chinese texts. They identified a trend of explicitness in adversative conjunctions, which is more prevalent in Chinese texts translated from English than in those originally written in Chinese. In another diachronic corpus analysis, Bisiada (2016) showed structural effects in German business articles that had been translated from English. Notably, translated

German texts exhibit a lower frequency of hypotactic structures compared to non-translated texts. Kranich (2009), also examining the English–German language pair, discovered that popular scientific texts translated from English into German are prone to source language interference.

At the same time, while the dominant position of English as a lingua franca and its influence on other languages are both reported in existing studies, very little research has been conducted into how English itself may be influenced by other languages during translation. Even less research has compared the extent of cross-linguistic influence in different directions. Exceptions include one bidirectional study, which examined 298 non-fictional texts in German and English using 27 lexico-grammatical indicators. This study found evidence of a strong "shining through" effect in German texts translated from English, but no such effect in English texts translated from German, a lower-prestige language (Evert and Neumann, 2017). In another study focusing on a single lexical indicator, Cappelle and Loock (2013) made inter- and intra-comparisons between translated and non-translated language through the use of the existential "there" in English and the equivalent construction "il y a" in French. The results reveal an underrepresentation of the existential "there" in English texts that have been translated from French, while the existential "il y a" exhibited an overrepresentation in translated French. These findings suggest that the source language interference is evident in translation from English into French but not in the other direction. Additionally, Cappelle and Loock (2017) found that phrasal verbs were underused in English translated from Romance languages, whereas no significant differences were observed between non-translated English and English translated from Germanic languages. This finding shows that the manifestation of source language influence may present varying patterns across different language pairs. Furthermore, Malamatidou (2017) investigated the creation of invented languages in a Russian novel by comparing the book's translations into five languages (English, French, German, Greek and Spanish). Through an analysis of Russian-derived nouns in the English version, it was observed that the use of invented language and overall creativity in translation are influenced not only by translators' own linguistic innovation, but also by a complex interplay of factors, including adaptation, a concept which comes from contact linguistics.

The available studies that have explored cross-linguistic influence on the formation of translational language shed light on translation as a locus of language contact. Yet the findings obtained so far are not conclusive, especially for those investigations that look solely at how English may be affected by other languages. Most existing studies tend to concentrate on only one translation direction and a limited number of language pairs, making it difficult to explore whether and how directionality and language pair play a role in the process of language contact.

2.2. Source language influence and translation universals

The present study will adopt a corpus-based approach to detecting source language influence in translation and exploring its implications for understanding translation as a site of language contact. The corpus-based approach has emerged as a valuable methodological paradigm for investigating the distinct characteristics of translational language and the underlying principles and contextual factors that shape its formation (Laviosa, 2002; Olohan, 2004). Within this line of research, a key objective is to identify recurrent linguistic patterns or regularities that can differentiate translational language from other language varieties. Baker (1993), in a pioneering study that used corpus-assisted methods to study translation, hypothesised that there are certain universal linguistic features that consistently emerge in translated languages, independent of the translation process. These universal tendencies include simplification, interference, explicitation, and normalisation. Despite the controversy surrounding the existence of "translation universals", numerous research efforts have since been made to explore and verify their manifestation in various translation scenarios (Tirkkonen-Condit, 2002).

Some researchers, largely influenced by the rapid development of corpus-based translation studies and its active search for universals, have attempted to detect source language influence from a corpus-linguistic perspective and explore its implications for understanding the unique properties of translational language. Among the many identified universals, interference has been one of the most typical manifestations. This phenomenon has been observed in the distribution of typical and atypical register features (Teich, 2003) and the use of passives in Chinese translations from English (Dai and Xiao, 2011), as well as the distribution of most frequent words as an indicator of lexical interference (Mauranen, 2004). For instance, Xiao (2011) conducted a corpus-based study of bidirectional English–Chinese translation covering a wide range of registers and found that under the influence of English as the source language, there is a tendency for translational Chinese to feature greater word length and also more frequent use of prefixes, suffixes, pronouns and word clusters, indicating a strong manifestation of interference. In addition to attributing some of the observed phenomena to source language influence, Xiao pointed out that some interference-induced changes relate to the translator's strategies. For example, the greater word length resulted from the translator's literal translation of long English names.

Corpus-based investigations of “translation universals” have proven to be an effective means of detecting the existence of source language influence. However, most studies tend to measure the extent of influence by looking at lexical features or local grammatical constructs. This begs the question of whether interference may be manifested at other linguistic levels, such as the syntactic structures of the translational language.

To fill this research gap, the present study will adopt dependency relation measures, namely dependency distance and dependency direction, to detect source language influence in a bidirectional multilingual corpus of original fiction and its translation. Specifically, this study will address the following research questions:

RQ1. How do the syntactic dependency characteristics of the source language manifest in the translation output?
RQ2. How do the directionality of translation and the specific language pair affect the manifestation of source language influence?
RQ3. How is the manifestation of source language influence implicative of translation as a site of language contact?

3. METHODOLOGY

3.1. Corpus design and description

In order to explore the impact of directionality and language pair on the manifestation of source language influence in translation, this study compiled a set of four large-scale bidirectional multilingual corpora containing contemporary fiction written by native speakers of different languages and its translation. The corpora focus in particular on modern fiction that has significant cultural or literary relevance, as evidenced by its widespread readership, critical recognition, or influence within its original literary tradition. In addition, the translated version of each work of fiction is available in the target language. This ensures that the corpus reflects contemporary literary works that are both meaningful within their source culture and accessible in translation.

The four corpora are made up of Non-translated Multilingual Fiction (NTMF), Translated English Fiction (TEF), Non-translated English Fiction (NTEF) and Translated Multilingual Fiction (TMF). NTMF consists of a total of 200 works of fiction, with 20 different works written by native speakers in each of ten languages: Chinese, Dutch, French, German, Italian, Japanese, Polish, Portuguese, Russian and Spanish. TEF contains the English translations of the multilingual fiction in NTMF. NTEF comprises ten groups of fiction originally written in English by native speakers, with each group containing 20 different works. Each group of English fiction was translated into a different target language, resulting in TMF: a total of 200 works of translated fiction, with 20 works in each of ten languages. The ten languages in NTMF and TMF are the same to ensure comparability across the four corpora. The structure of the dataset is summarised in Fig. 1, where ST and TT indicate source text and target text respectively, while the blue arrow shows the translation direction. Table 1 presents the descriptive statistics for each corpus, including the number of word types and tokens, type-token ratio (TTR), and standardised type-token ratio (STTR).

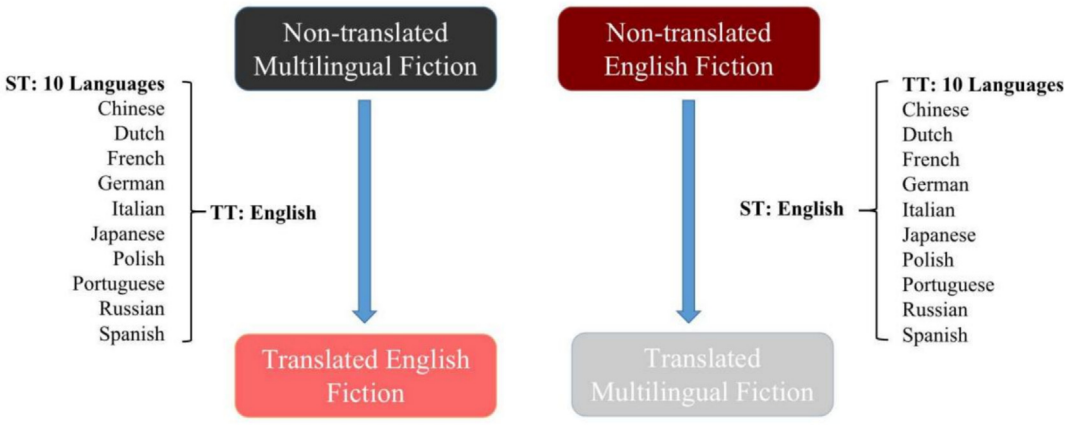

Fig. 1. The structure of the corpus.

Table 1
Descriptive statistics of the four corpora.

Non-translated Multilingual Fiction (NTMF)				
Corpus	Types	Tokens	TTR	STTR
NTMF_Chi	337,520	3,137,077	10.85%	48.88%
NTMF_Dut	188,000	1,884,242	12.05%	44.17%
NTMF_Fre	223,190	3,784,503	9.00%	42.11%
NTMF_Ger	332,689	3,193,689	13.75%	49.09%
NTMF_Ita	246,028	1,829,440	14.45%	48.45%
NTMF_Jap	150,415	1,745,612	9.35%	37.56%
NTMF_Pol	304,035	1,730,280	20.25%	56.21%
NTMF_Por	218,567	2,068,803	11.42%	45.39%
NTMF_Rus	174,979	5,324,749	4.25%	30.61%
NTMF_Spa	219,923	2,364,583	11.75%	41.77%
Translated English Fiction (TEF)				
Corpus	Types	Tokens	TTR	STTR
TEF_Chi	193,276	2,657,585	8.15%	44.05%
TEF_Dut	167,291	1,954,382	10.35%	44.86%
TEF_Fre	225,203	3,617,765	9.50%	44.48%
TEF_Ger	234,311	3,544,134	9.55%	44.07%
TEF_Ita	185,230	1,958,599	10.05%	44.16%
TEF_Jap	135,593	1,610,347	10.35%	43.35%
TEF_Pol	173,234	1,727,469	11.40%	45.87%
TEF_Por	174,745	2,055,042	9.10%	44.09%
TEF_Rus	206,464	2,668,077	9.40%	44.99%
TEF_Spa	179,937	2,299,158	10.15%	43.43%
Non-translated English Fiction (NTEF)				
Corpus	Types	Tokens	TTR	STTR
NTEF_Chi	180,931	1,896,592	9.75%	45.15%
NTEF_Dut	157,350	2,150,880	9.65%	42.77%
NTEF_Fre	130,320	1,380,054	9.70%	41.98%
NTEF_Ger	133,486	1,490,401	9.50%	42.07%
NTEF_Ita	144,366	1,691,980	9.25%	41.66%
NTEF_Jap	144,180	1,506,777	11.05%	43.88%
NTEF_Pol	158,586	2,380,161	7.35%	43.67%
NTEF_Por	139,837	1,657,971	9.40%	42.64%
NTEF_Rus	121,250	1,448,256	9.15%	41.44%
NTEF_Spa	190,715	2,312,097	8.85%	43.01%
Translated Multilingual Fiction (TMF)				
Corpus	Types	Tokens	TTR	STTR
TMF_Chi	211,085	1,864,996	11.80%	50.90%
TMF_Dut	199,330	2,063,865	11.30%	43.84%
TMF_Fre	157,369	1,744,326	9.70%	41.93%
TMF_Ger	185,165	1,487,296	13.25%	48.49%
TMF_Ita	205,897	1,723,821	12.50%	47.12%
TMF_Jap	165,695	2,026,965	9.05%	37.36%
TMF_Pol	290,201	2,247,364	13.25%	54.01%
TMF_Por	176,942	1,810,540	11.20%	44.29%
TMF_Rus	94,142	2,046,900	4.75%	29.67%
TMF_Spa	207,948	2,279,914	10.45%	41.45%

3.2. Dependency-based measures

The present study adopts dependency grammar as the framework for syntactic analysis (Hudson, 1995; Liu, 2008, 2010). Two dependency-based measures, namely dependency distance and dependency direction, are employed to detect source language influence in translational language. These measures model the variation of dependency rela-

tions across source texts, translated texts and non-translated texts in the same target language for each direction and language pair to detect source language influence. Dependency distance (DD) describes the linear distance between two grammatically related words in a sentence (Hudson, 1995). In a dependency relation, one word acts as the governor (the head or controlling word), while the other is the dependent (the subordinate or modified word). For example, in the phrase “read a book”, “read” is the governor and “book” is the dependent, as the verb governs the noun. DD is a widely recognised metric for assessing syntactic complexity and the cognitive load involved in language processing (Liu, 2008; Liu et al., 2017; Xu and Liu, 2023, 2024). In contrast, dependency direction refers to the linear order of words in a dependency relation, that is, whether the governor precedes or follows the dependent. This distinction serves as a key feature for analysing sentence structure and classifying language typologies (Liu, 2010). Both concepts were initially developed for typological research, focusing on the measurement and analysis of dependency relations across languages (Liu, 2008, 2009; Liu et al., 2017; Liu and Xu, 2012).

The past few years have witnessed an emerging interest in using dependency-based measures to explore the unique properties of translational language (Fan and Jiang, 2019; Liang and Sang, 2022; Liang et al., 2017; Xu and Liu, 2023, 2024). For example, in a corpus-based study of abstracts translated from Chinese into English, Liang and Sang (2022: 13) found that the translated English abstracts exhibited a longer mean dependency distance (MDD) than the abstracts originally written in English, suggesting greater syntactic complexity. Liang and Sang (2022) attributed this increased dependency distance to source language influence, noting that Chinese typically has longer dependency distance than English. The translated abstracts also showed a higher proportion of head-final relations than those originally written in English, reflecting another aspect of source language influence, as Chinese is more head-final than English. Similar patterns were observed by Fan and Jiang (2019) in translated government reports and by Xu and Liu (2023) in interpreted speech. Liang and Sang (2022) further highlighted a phenomenon whereby translational English is influenced at the phrase level: it has a higher frequency of adjective-noun dependency pairs than do texts originally written in English. As adjective-noun dependency pairs are a linguistic convention typical of Chinese, this provides further evidence of interference. Collectively, these studies underscore the effectiveness of dependency distance and dependency direction as metrics for identifying source language influence in translational language.

3.3. Calculating dependency distance and dependency direction

There are three core properties in a dependency relation: (1) the relation between two linguistic units in a sentence is binary; (2) the relation is usually asymmetrical, with one unit acting as the governor and the other as the dependent; (3) the grammatical relations between the linked units are classified according to a range of labels displayed above the connecting arcs (Liu, 2008). Based on these properties, a directed dependency tree can illustrate the syntactic structure of a sentence. Fig. 2 shows the dependency analysis of the sentence “The girl saw a bird”.

In the sentence “The girl saw a bird”, all five words are connected by means of grammatical relations. Specifically, the subject “girl” and the object “bird” depend on the main verb “saw”. Definite and indefinite articles “the” and “a” depend on the nouns they modify, respectively. The labelled arc is directed from the governor to the dependent, as in the pair “the girl”, where “girl” is the governor and “the” is the dependent. Liu (2008) proposes a formula to calculate the MDD of a sentence, as shown below:

$$MDD\,(\text{sentence}) = \frac{1}{n-1}\sum_{i=1}^{n-1}|\mathrm{DD}_i|$$

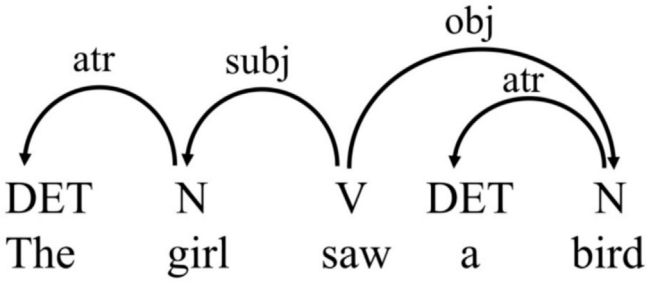

Fig. 2. The dependency structure of the sample sentence.

In this formula, n is the number of words in the sentence and DD_i is the dependency distance of its i-th syntactic link. Normally, the root verb is the only word in a sentence without a governor, and its DD is defined as zero. The MDD of the sample sentence is 1.25. The MDD of a whole text can be calculated using the following formula. In this case, n is the total number of words in the sample, and s is the total number of sentences. Similarly, DD_i is the dependency distance of the i-th syntactic link of the sentence:

$$MDD(\text{text}) = \frac{1}{n - s}\sum_{i=1}^{n-s}|DD_i|$$

Dependency directions in sentences can be categorised as either head-final or head-initial. Liu (2010) investigated dependency direction across 20 languages and found significant variation in their distributions. For instance, Chinese exhibits a strong preference for head-final structures, whereas English displays a more balanced distribution of head-final and head-initial dependencies (Liu, 2010). To quantify these patterns, Liu (2009) developed a method for calculating the frequency of distribution of head-final and head-initial dependencies within sentences. The formulas are provided below. The sample sentence in Fig. 2 has one head-initial grammatical pair and three head-final pairs, which means the distribution percentages for head-initial and head-final dependencies are 25% and 75% respectively, and their combined frequency distribution is 100% (Liu, 2010; Wang and Liu, 2017).

$$\text{Percentage of head} - \text{final dependency} = \frac{\textit{frequencies of the head} - \textit{final dependency}}{\textit{total number of dependencies in the treebank}} \times 100$$

$$\text{Percentage of head} - \text{initial dependency} = \frac{\textit{frequencies of the head} - \textit{initial dependency}}{\textit{total number of dependencies in the treebank}} \times 100$$

For the present study, a Python programme was used to calculate the MDD and dependency direction of each of the texts in the four corpora.[1]

4. FINDINGS

The MDD and the dependency direction are calculated for each text in the four corpora (NTMF, TEF, NTEF, and TMF). Each corpus contains ten sub-corpora, with each sub-corpus consisting of 20 works of fiction in the same language. As the sum of the frequency distribution of the head-initial and head-final relations in any sentence equals 100% (Liu, 2010; Wang and Liu, 2017), this study examines the head-final relations to reflect the dependency direction characteristics of the four corpora. The mean values of the MDD and the head-final distribution percentage (HF) across the 20 texts in each sub-corpus are presented in Tables 2 to 5. This section concentrates on modelling the MDD and HF variation to detect source language influence in translated fiction, and also on exploring how the observed variation may be affected by translation direction and language pair.

4.1. MDD variation across the four corpora

The mean values of MDD across the four corpora are visualised in Fig. 3. To explore the potential manifestation of source language influence when original English works of fiction are translated into a range of different languages, the mean values of MDD across source texts (NTEF), translated texts (TMF), and non-translated texts in the same target language (NTMF) were compared. If the MDD of TMF varies from that of NTMF and presents an orientation towards the dependency characteristics of NTEF, this variation may indicate source language influence.

The results show that all the mean values of MDD of TMF are lower than those of NTMF, indicating that translated multilingual fiction features reduced syntactic complexity compared with original non-translated multilingual fiction. This variation pattern largely supports the exhibition of the simplification phenomenon, which refers to the tendency for translated texts to use more simplified linguistic constructs than non-translated texts in the same language (Bernardini et al., 2016; Jantunen, 2001; Laviosa, 2002). At the same time, it is interesting to note that the mean values of MDD of NTEF are shorter than those of NTMF. This reveals that English has a lower MDD than the other languages investigated, which is consistent with Liu's (2008) study. This finding seems to indicate that when a text is translated from a low-MDD language into a high-MDD language, the MDD of the translated language tends to be lower than that of non-translated target language. Seen from this perspective, the observed variation may also result from the syntactic char-

[1] Open-accessed MDD calculators of all eleven languages are downloaded from https://spacy.io/models/en (accessed 24 March 2025).

Table 2
MDD and dependency direction of Non-translated Multilingual Fiction (NTMF).

Corpus	MDD		HF	
	Mean	SD	Mean	SD
NTMF_Chi	3.11	0.28	0.55	0.027
NTMF_Dut	2.86	0.27	0.65	0.025
NTMF_Fre	2.74	0.38	0.58	0.034
NTMF_Ger	3.12	0.39	0.51	0.023
NTMF_Ita	2.74	0.25	0.59	0.050
NTMF_Jap	2.96	0.38	0.47	0.021
NTMF_Pol	2.56	0.46	0.50	0.020
NTMF_Por	6.54	1.33	0.55	0.097
NTMF_Rus	2.93	0.55	0.56	0.024
NTMF_Spa	2.85	0.51	0.47	0.188

Table 3
MDD and dependency direction in Translated English Fiction (TEF).

Corpus	MDD		HF	
	Mean	SD	Mean	SD
TEF_Chi	2.36	0.13	0.51	0.012
TEF_Dut	2.34	0.25	0.50	0.013
TEF_Fre	2.60	0.37	0.50	0.021
TEF_Ger	2.74	0.40	0.50	0.017
TEF_Ita	2.66	0.19	0.49	0.015
TEF_Jap	2.27	0.15	0.51	0.011
TEF_Pol	2.47	0.27	0.49	0.022
TEF_Por	2.91	0.66	0.51	0.018
TEF_Rus	2.58	0.33	0.49	0.016
TEF_Spa	2.55	0.31	0.51	0.056

Table 4
MDD and dependency direction of Non-translated English Fiction (NTEF).

Corpus	MDD		HF	
	Mean	SD	Mean	SD
NTEF_Chi	2.33	0.22	0.50	0.010
NTEF_Dut	2.44	0.31	0.49	0.016
NTEF_Fre	2.52	0.28	0.50	0.013
NTEF_Ger	2.58	0.53	0.49	0.019
NTEF_Ita	2.48	0.33	0.51	0.023
NTEF_Jap	2.70	0.25	0.49	0.011
NTEF_Pol	2.16	0.25	0.50	0.017
NTEF_Por	2.30	0.20	0.50	0.014
NTEF_Rus	2.35	0.29	0.50	0.016
NTEF_Spa	2.60	0.27	0.49	0.010

acteristics of the source language shining through the translated texts, causing them to vary from their non-translated forms.

For the other translation direction, that is, when fiction was translated from ten other languages into English, the mean value of MDD across source texts (NTMF), translated texts (TEF) and non-translated texts (NTEF) in the same target language were compared. The results show that the mean values of the MDD of TEF were lower than those of NTEF in only three language pairs (Dutch–English, Japanese–English and Spanish–English), showing a tendency for lower syntactic complexity. In contrast, for the remaining seven language pairs, the translated English works exhibited

Table 5
MDD and dependency direction in Translated Multilingual Fiction (TMF).

Corpus	MDD		HF	
	Mean	SD	Mean	SD
TMF_Chi	2.76	0.46	0.58	0.015
TMF_Dut	2.80	0.46	0.60	0.115
TMF_Fre	2.60	0.18	0.59	0.012
TMF_Ger	2.71	0.38	0.52	0.037
TMF_Ita	2.44	0.22	0.61	0.016
TMF_Jap	2.89	0.17	0.46	0.019
TMF_Pol	2.04	0.19	0.52	0.016
TMF_Por	2.31	0.21	0.56	0.044
TMF_Rus	2.56	0.26	0.56	0.026
TMF_Spa	2.54	0.27	0.59	0.021

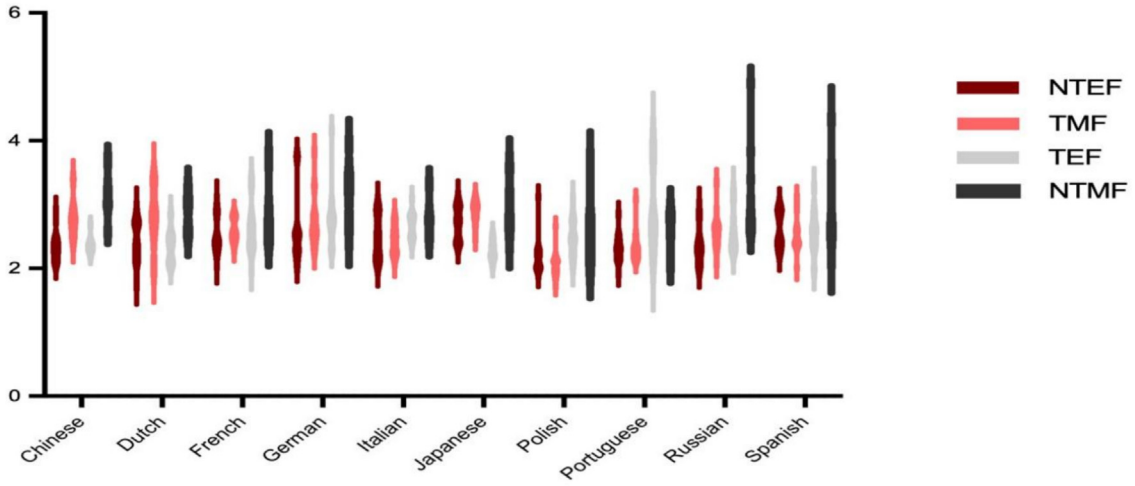

Fig. 3. MDD comparisons among the four corpora.

greater syntactic complexity than the original English. Taking into account the observed MDD variation pattern in the opposite direction, this finding reveals that only three language pairs exhibited the simplification phenomenon in both directions. Most language pairs showed simplification in one direction – specifically, from a low-MDD language to a high-MDD language. Conversely, when translating from a high-MDD language to a low-MDD language, increased syntactic complexity was observed in seven language pairs, suggesting the presence of source language influence on the formulation of syntactic structures in translation output. These results reveal that the manifestation of simplification is largely influenced by both translation direction and language pair.

To determine whether the observed MDD variations have statistical significance, one-way ANOVA tests were conducted to compare the MDD mean values across the four corpora for the ten language pairs. In Shapiro-Wilk tests, the datasets of only three language pairs (English–Chinese, English–Dutch and English–Japanese) show a normal distribution. Kruskal-Wallis H tests were performed for the remaining seven language pairs. To avoid Type I errors due to multiple comparisons, a Bonferroni correction was applied to adjust the significance threshold to 0.007 (0.05/7) for the Kruskal-Wallis H tests. The results of the two sets of tests show that apart from the English–French and English–Spanish pairs, the MDD mean value comparisons reach statistical significance. This is shown in Table 6. Tukey post-hoc tests were conducted for the one-way ANOVA tests and Dunn's tests for the Kruskal-Wallis H tests, to further explore pairwise differences between the relevant corpora.

Table 7 lists the results of the pairwise comparisons between the corpora that are related to the exploration of the presence of source language influence in translated texts. It was found that the MDD differences between NTEF and NTMF were statistically significant in seven out of the ten language pairs, confirming that English typically has a shorter

Table 6
ANOVA and Kruskal-Wallis H test results of MDD across the four corpora.

ANOVA	**F**	**df**	***p* value**
Eng–Chi	38.674	79	0.000*
Eng–Dut	6.960	79	0.000*
Eng–Jap	3.124	79	0.031*
Kruskal-Wallis H	**H**	**df**	***p value***
Eng–Fre	5.532	3	0.137
Eng–Ger	24.676	3	0.000*
Eng–Ita	15.808	3	0.001*
Eng–Pol	26.629	3	0.000*
Eng–Por	22.787	3	0.000*
Eng–Rus	29.05	3	0.000*
Eng–Spa	8.403	3	0.038

* indicates statistically significant results.

Table 7
Pairwise comparisons of MDD among the relevant corpora.

	TMF–NTMF	**NTEF–NTMF**	**TEF–NTEF**
Eng–Chi	<*	<**	>**
Eng–Dut	<	<*	<*
Eng–Ger	<*	<**	>**
Eng–Ita	<**	<*	>*
Eng–Jap	<	<	<
Eng–Pol	<**	<*	>*
Eng–Por	<**	<**	>**
Eng–Rus	<*	<**	>**

** indicates *p* value is lower than 0.001; * indicates *p* value is lower than 0.05.

MDD than most of the languages included in NTMF. Notably, when English fiction (NTEF) was translated into fiction in the other languages (TMF), that is, from a low-MDD language into a high-MDD one, the MDD of TMF was shorter than that of non-translation multilingual fiction (NTMF) in six language pairs, with statistical significance. This finding supports the presence of simplification and source language influence. For the other translation direction, that is, fiction translated from multilingual languages, which are high-MDD, to English, a low-MDD language, the MDD of the translated English fiction (TEF) was longer than that of non-translated English fiction in six language pairs, with statistical significance, suggesting the presence of source language influence in this direction. In contrast, the presence of simplification, as evidenced by significantly reduced MDD, was only found in one language pair (English–Dutch) in this direction. These findings show that while the presence of source language influence and simplification depended significantly on the language pair, the presence of the former was not so much affected by translation direction compared with the latter, which primarily appeared in only one direction.

4.2. HF variation across the four corpora

The mean values of the HF across the four corpora are visualised in Fig. 4. Apart from Japanese, Polish and Spanish, English tends to be less head-final than the languages in NTMF. When English fiction (NTEF) was translated into multilingual fiction (TMF), the dependency direction characteristics of TMF exhibited a mixed pattern as compared to those of non-translated multilingual fiction (NTMF). Source language influence was only found in two language pairs (English–Dutch and English–Spanish). For instance, when English fiction was translated into Dutch, a more head-final language, the translated Dutch was less head-final than non-translated Dutch, showing an alignment with the dependency direction characteristics of English, the source language. In addition to Polish and Russian, the other six language pairs demonstrated a tendency for the translated fiction to orient towards the dependency direction characteristics of the target language. For instance, when English fiction was translated into Chinese, the translated fiction featured an increased percentage of head-final relations compared with the non-translated Chinese fiction.

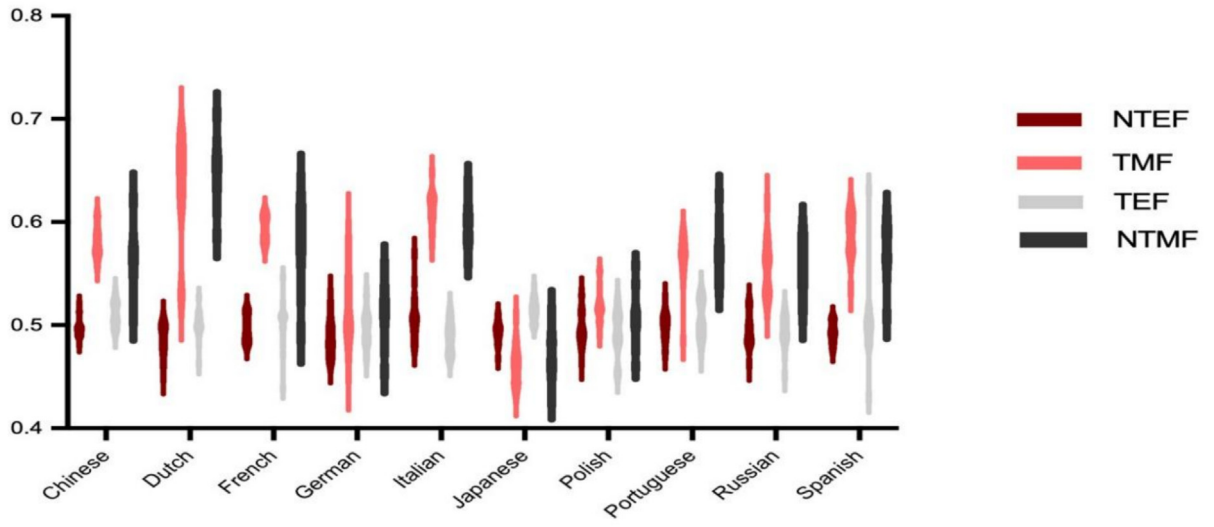

Fig. 4. HF comparison across the four corpora.

In the other direction, when fiction was translated from Chinese, Dutch, German and Portuguese into English, the translated English fiction tended to be more head-final than non-translated English, suggesting source language influence, as these four source languages are more head-final than English. Conversely, an opposite trend was observed in four other language pairs. When fiction was translated from Italian and Russian, both more head-final than English, the translated English texts exhibited more head-initial relations, aligning more closely with the target language's dependency direction orientation. A similar tendency to conform with the target language's word order convention was observed in translations from Japanese and Spanish.

To determine whether the observed dependency direction variations have statistical significance, one-way ANOVA tests were conducted regarding the comparisons of the mean values of HF among the four corpora for the ten language pairs. Shapiro-Wilk tests of the HF values among the four corpora show that the dataset of six language pairs shows a normal distribution. Kruskal-Wallis H tests were performed for the remaining four language pairs. To avoid Type I errors due to multiple comparisons, a Bonferroni correction was applied to adjust the significance threshold to 0.008 (0.05/6) for the one-way ANOVA tests. The results of the one-way ANOVA tests and the Kruskal-Wallis H tests for HF comparisons reached statistical significance for all the language pairs. This is shown in Table 8. Tukey post-hoc tests were conducted for the one-way ANOVA tests and Dunn's tests for the Kruskal-Wallis H tests, to further explore pairwise differences between the relevant corpora.

Table 8
ANOVA and Kruskal-Wallis H test results of HF across the four corpora.

ANOVA	**F**	**df**	***p* value**
Eng–Chi	101.038	79	0.000*
Eng–Ger	5.708	79	0.001*
Eng–Ita	82.08	79	0.000*
Eng–Jap	45.921	79	0.000*
Eng–Pol	7.057	79	0.000*
Eng–Rus	53.374	79	0.000*
Kruskal-Wallis H	**H**	**df**	***p value***
Eng–Dut	46.006	3	0.000*
Eng–Fre	55.864	3	0.000*
Eng–Por	48.33	3	0.000*
Eng–Spa	35.263	3	0.000*

* indicates statistically significant results.

Table 9
Pairwise comparisons of HF between the relevant corpora.

	TMF-NTMF	NTEF-NTMF	TEF-NTEF
Eng–Chi	>**	<**	>
Eng–Dut	<	<**	>*
Eng–Fre	>	<**	>
Eng–Ger	>	<*	>
Eng–Ita	>*	<**	<
Eng–Jap	<	>**	>**
Eng–Pol	>	<	<
Eng–Por	>	<**	>
Eng–Rus	<	<**	<
Eng–Spa	>	>**	>

** indicates *p* value is lower than 0.001; * indicates *p* value is lower than 0.05.

Table 9 outlines the results of the pairwise comparisons that are related to exploring the presence of source language influence in translated texts. The results confirm that the HF of English is significantly shorter than that of seven of the languages in the NTMF (Chinese, French, Dutch, German, Italian, Portuguese and Russian), confirming that English is less head-final than these languages. In addition, it is interesting to note that while HF differences were found between translated and non-translated texts in the same language for both translation directions, the majority of these differences did not have statistical significance. This is evidenced by the HF comparisons between TMF and NTMF, as well as those between NTEF and TEF. This finding reveals that the distribution percentage of HF in translated fiction did not differ much from that in non-translated fiction in the same language, suggesting a tendency for translated texts to comply with the language use conventions of the target language. This also suggests that the source language has only limited influence on word order in translated fiction.

5. DISCUSSION

5.1. The manifestation of source language influence

Generating data from a large-scale bidirectional multilingual corpus of original fiction and its translation across ten language pairs, this study has explored source language influence on the production of translational language and how its manifestation is shaped by contextual factors, including directionality and language pair. Dependency distance and dependency direction were used to model the variation in the dependency relations of translational language as compared to its respective source and target languages in order to detect source language influence, a sign of language contact. Our findings show that when translation was performed from English into the ten other languages in NTMF, that is, from a low-MDD language to a high-MDD language, the translated fiction tended to exhibit diminished syntactic complexity compared to non-translated fiction in the same language in six out of the ten language pairs. Conversely, when the translation was performed in the other direction, that is, from a high-MDD language to a low-MDD language, the translation output manifested an increased level of syntactic complexity in the same six language pairs. These results largely confirm the presence of source language influence, aligning with previous research (Fan and Jiang, 2019; Liang and Sang, 2022; Xu and Liu, 2024). Furthermore, this study reveals that the manifestation of source language influence was not significantly affected by direction, as it appeared balanced in both directions. Instead, its manifestation was more likely influenced by language pair, providing corroborative evidence for Cappelle and Loock's (2017) findings.

In addition, this study reveals that the influence of source language on the dependency relation characteristics of translational language is limited, as evidenced by the variation in patterns of dependency direction. Specifically, when the mean values of HF were examined, source language influence was detected in only two language pairs when English fiction was translated into other languages and in four language pairs in the reverse translation direction. Furthermore, the majority of these instances of source language influence lacked statistical significance. In contrast, a stronger tendency observed was for the translational language to align with the target language's word order conventions across the language pairs in both translation directions. This may stem from translators' deliberate efforts to comply with the norms of the target language by aiming to produce idiomatic translation (Chesterman, 1997; Venuti, [1995] 2017). Translators may choose to prioritise fluency and readability in the target language to meet the expectations of the target audience, which inherently reduces the likelihood of source language interference. Seen from this perspective, source language influence on the syntactic structure of the translational language is limited (Wang and Liu, 2017). This result

also reveals that the manifestation of source language influence may not be consistent across different syntactic aspects of the translational language. Instead, its presence may vary depending on specific operationalisation approaches and translation strategies. Xu and Liu (2024) reported similar findings in their study on the dependency characteristics of interpreted speech. They identified the presence of source language influence in interpreted speech, as evidenced by the MDD variation pattern. At the same time, the interpreted speech also exhibited an orientation towards the word order conventions of the target language, reflecting the interpreter's intention to produce idiomatic and natural renditions.

5.2. The universality of simplification

The observed patterns of syntactic complexity, as evidenced by MDD variations, have implications for understanding the universality of simplification, a widely investigated unique property of translational language. Simplification describes a tendency for translated language to feature a reduced level of complexity compared with non-translated texts in the same language. It may be evident in various linguistic dimensions, including vocabulary, syntactic structure and overall textual intricacy (Jantunen, 2001; Kenny, 2001; Laviosa, 2002). It is proposed that translators, either consciously or subconsciously, often modify a text to enhance its accessibility for the target audience, thereby diminishing linguistic richness and complexity in order to ensure clarity and comprehensibility (François and Lefer, 2022; Jantunen, 2001).

However, the present study suggests that syntactic simplification may not be a universal characteristic of translational language. Reduced syntactic complexity was observed in translations from English into the ten other languages examined, with statistically significant differences found in six of these cases. In contrast, when analysing translations into English, the results were more heterogeneous: syntactic simplification was noted in only three language pairs, with only one of these pairs (English–Dutch) showing statistical significance. These findings align with previous research indicating an asymmetric presence of simplification across different translation directions and language pairs (Becher, 2009; Cappelle and Loock, 2013; Cvrček and Chlumská, 2015; Jantunen, 2001). These studies seem to suggest that the manifestation of simplification is closely related to directionality and the syntactic properties of the source language. From this perspective, simplification may be more accurately characterised as a consequence of language contact, where the source language projects certain aspects of its dependency relations on the target language, rather than as an inherent result of the translation process itself. This view positions the notion of simplification within the broader framework of language contact dynamics and challenges its status as a universal phenomenon of translation.

Methodologically, the directional sensitivity of "translation universals" underscores the importance of considering both directions when investigating the universal features of translated languages. Kruger and van Rooy (2012) emphasise the potential influence of language pair and text type on the investigation of "translation universals". Investigations into the linguistic features of translational language should, therefore, adopt a more nuanced approach, considering a wider range of modulating factors rather than treating these features as universal phenomena applicable across all linguistic, social and cultural contexts.

6. CONCLUSION

Recognising translation as a site of language contact, this study has utilised dependency relation measures, specifically dependency distance and dependency direction, to detect source language influence on translated texts at the syntactic level and to investigate how its manifestation may be affected by directionality and language pair. The data was obtained from a large-scale bidirectional multilingual corpus containing fiction and its translation across ten language pairs, all of which included English. Analysis of the MDD variation pattern in the translated fiction revealed a balanced presence of source language influence in both translation directions. However, this influence was not observed across all language pairs, suggesting that its manifestation is more affected by language pair than by directionality. In addition, the study indicates that the source language has limited influence on the dependency direction characteristics of translated fiction, which tend to align with the target language's word order conventions. This tendency may reflect translators' efforts to produce idiomatic translations that adhere to the word order norms of the target language. Furthermore, this study reveals that simplification, a widely examined "translation universal", only occurred in one translation direction for most language pairs. This finding suggests that simplification may not be a unique property of translational language, but rather, a manifestation of the phenomenon of language contact, where the linguistic features of the source language significantly influence the structural patterns of the target language.

These findings highlight the need to move beyond reductive assumptions that translation inherently simplifies the linguistic features of the target text. Instead, the results point to the importance of considering the specific language pair, the translation directionality, the translator's strategies, and the linguistic properties under investigation. Future research on the nature of translational language may consider incorporating a wider range of modulating factors. More broadly,

given the importance of translation as an avenue for language contact, greater convergence between contact linguistics and translation studies is crucial in terms of both theoretical assumptions and empirical realisation.

CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Isabelle Chou: Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation. **Kanglong Liu:** Writing – review & editing, Supervision, Project administration, Conceptualization. **Han Xu:** Writing – review & editing, Supervision, Methodology, Formal analysis.

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Data availability

Data will be made available on request.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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