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Review Article

A Contrastive Study of Word Order in Chinese and English and its Implications for Neutral Network Machine Translation

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Abstract: This study presents an contrastive examination of word order variations in Chinese and English, with a specific focus on their syntactic distinctions that influence machine translation outcomes. By meticulously analyzing word formation, phrase, clause, and sentence, the research contributes valuable insights aimed at enhancing translation accuracy. For such a micro-level contrast, two distinct translation approaches, namely sequential translation and conversion translation, are delineated. Regarding machine translation implications, a proposed flow chart emphasizes the importance of fluency and aesthetic qualities, incorporating a contrastive word order corpus and a comprehensive Chinese-English database. Additionally, ethical considerations are integrated into the flow chart to ensure the overall quality of the translated text.

Keywords: Contrastive Study, Word Order, Chinese and English, Machine Translation.

INTRODUCTION

The arrangement of linguistic units, known as word order, encompasses the sequential structure of language at various levels, from minute morphemes to sentence clusters (Pan 1997). It is deemed that these linguistic units, spanning a spectrum of sizes, form the focal point of investigation within the domain of word order. Additionally, word order stands as a ubiquitous characteristic across all natural languages, constituting a fundamental divergence among them (Li 2010).

In the ordinary course of language construction, sentence components exhibit a relatively fixed position, resistant to alteration under standard circumstances. Deviating from this norm may lead to instances where the sentence loses coherence, resulting in a vastly different meaning. Alternatively, the fundamental meaning of the sentence may persist, yet the emphasis and impact undergo modification. The former two scenarios attract scrutiny within the realm of grammatical analysis, while the latter delves into the nuanced variations in emphasis and expressive impact.

Modern linguists, employing a semantic lens, have deduced that word order itself can convey meaning. Extensive analysis of linguistic materials has led to the conclusion that sentences sharing a conceptual meaning may produce distinct thematic nuances and possess disparate communicative values solely due to variations in word order. Recognizing translation as a social undertaking wherein the translator acts as an intermediary, faithfully and fluently conveying source language content to foreign language readers, underscores the significance of semantic rather than formal translation. In this context, the understanding of sentence meaning and the order in which it is conveyed holds paramount importance.

The standing or starting point of contrastive study should always be the notion that Chinese is a semantic type language with the eminent characteristic of flexibility or elasticity as a complement, while English is a morphological type language with the outstanding characteristic of rigidity as a complement.

It contends that unveiling the ideographic function of word order and discerning disparities between English and Chinese word order is instrumental in enhancing the quality and efficiency of machine translation. Furthermore, it contributes to the nuanced development of the English-Chinese word order conversion model within machine translation programs. The subsequent analysis in this paper endeavors to explore the contrastive aspects of English-Chinese word order and translation by delving into the semantic differences arising from alterations in word order.

Notably, what follows is only a micro-level contrast of Chinese-English word order, which naturally cannot generalize all types of it.

LITERATURE REVIEW

The investigation into word order in Chinese remains a persistent area of interest within the study of Chinese grammar, posing challenges to the theories of universal grammar (Xu 1995). As to word order, or to say the order of linguistic\language units, refers to the order of certain degree of language units in their upper-rank units up along the so-called Grammatical Hierarchy in traditional grammar. The examination of word order has progressed through three discernible research dimensions: the syntactic pattern, which involves the arrangement of subject and predicate, determiner and central word in a sentence; the semantic pattern, focusing on the sequence of agent and object; and the pragmatic pattern, exploring the order of theme and topic.

Historically, the emphasis in research has predominantly favored the syntactic dimension, neglecting the semantic and pragmatic considerations, resulting in a limited understanding of the inherent flexibility of word order. Studies on the syntactic pattern reveal Mandarin as a typical VO language (Sun C *et al.*, 1985). Investigations comparing canonical post-verbal forms, ba forms, and topicalized preposed forms have identified nuanced conditions favoring the ba form (Liu 2007). Additionally, research on Sino-Tibetan languages highlights both SOV and SVO orders, with a prevailing assumption that SVO order was borrowed from surrounding languages (Gell-Mann M *et al.*, 2011). The specification of definiteness in Chinese noun phrases relies on linguistic features such as word order, meaning, and form, following a structural pattern where definite reference precedes indefinite reference. In contrast, English relies on the definite article "the" as the primary marker for definite reference. Other linguistic elements, including proper nouns, pronouns, subordinate pronouns, and demonstrative pronouns, also contribute to indicating definiteness in English noun phrases.

The exploration of the semantic pattern has seen limited research, with an exception being the thesis titled "*A Comparison of English and Chinese Word Order and Translation*." The thesis argues that the choice between regular and special positions in a sentence, conveying the same semantic content, yields distinct expressive effects or thematic significance (Wang *et al.*, 1993). The selection between normal and special positions hinges on the expressive requirements of the context, guided by considerations of semantic focus and contextual relevance.

Regarding the pragmatic pattern, researchers have presented various perspectives. Recognizing and understanding cognitive differences arising from language order nuances is crucial for smooth communication and error prevention (Mao 2003). Language and cognition, intimately linked and mutually dependent, form the basis for variations in English word order, influenced by graphical or contextual patterns of information processing. Notably, Chinese characters possess intrinsic meanings in text, whereas individual characters lack meaning in English. Learners of Chinese as a foreign language often misplace characters in sentences, resulting in inaccuracies or ungrammatical constructions (Cheng S M *et al*., 2014).

In conclusion, a pragmatic exploration of word order, considering actual language usage, offers valuable insights for foreign language teaching and English-Chinese translation. Acknowledging the dynamic and context-dependent nature of language use, such insights have the potential to refine language instruction methodologies and improve translation practices between English and Chinese. The field of pragmatics advocates for an examination of linguistic phenomena within the context of actual usage. By adopting this perspective, we can scrutinize fundamental factors influencing the choice of English-Chinese word order.

However, in the realm of English-Chinese machine translation, a central challenge lies in ensuring the consistency or divergence of word order between the two languages is appropriately addressed. A meticulous comparative study of language correspondence becomes paramount for addressing this concern (Wang *et al.*, 1981). A detailed comparative study examines language correspondence, aiming to uncover fundamental laws for effective translation. The construction of English machine translators involves input processing, utilizing human-computer interaction and extensive thesaurus analysis, followed by a decoding process, optimizing translation results from large datasets (Chen 2022). AI language models, like Chat GPT and ERNIE Bot, learn grammar, vocabulary, and expression habits across languages, achieving accurate and fluent translations. Neural network translation systems simulate the human brain, but challenges persist, leading to errors in comprehension and analysis (Nie 2023). Despite this, these models showcase advanced natural language processing capabilities, interacting seamlessly with users in speech or text.

What is more, some scholars have argued that the relationship between machine translation technology and translators undergoes constant alienation. If not managed properly, the integration of machines into translation may not offer "freedom" to translators but rather lead to a form of "self-bondage" (Wu *et al.*, 2023). Translators shoulder the imperative of elevating their ethical standards, cognizant of machine translation as a tool devoid of absolute authority—a mere auxiliary. Engaging in post-translation editing demands an active deployment of subjective initiative when utilizing machine translation tools, steering clear of the pitfalls of over-reliance and misuse. In tandem, translators are obliged to perpetually hone their linguistic proficiency and refine translation strategies to safeguard the quality of translation, thus reasserting the subjective agency of translators within the translation process.

Notwithstanding its demonstrated merits, the approach remains firmly ensconced within the framework established by Western scholars, revealing a discernible shortfall in cultural confidence. As such, there is a prevailing sentiment that a distinctly Chinese perspective on the contrastive study between Chinese and English should be asserted. This entails a meticulous micro-contrast analysis of the order of linguistic units across morphology, phrase, clause, and sentence levels. The overarching goal is to elucidate the inherent rules and laws governing word order in English and Chinese, thereby mitigating challenges inherent in English-Chinese machine translation.

Contrastive Case Analysis

The order of language components plays an important role in declarative language and syntactic relation. Some proposed that in both English and Chinese, there is a certain word order in both spoken and written language, and it is presented in a linear combination of language units. It is believed that from the perspective of linguistic morphology, Chinese belongs to the analytic language, whose main feature is that the word order is generally fixed. While English belongs to the language that is gradually transformed from synthetic to analytical. Therefore, its word order is relatively fixed while also changing. This is the reason why English and Chinese differ in word order. It is agreed that Chinese focus on the logical order, which belongs to the natural word order, while English not only belongs to the natural word order, but also has the specific word order and flexible sentence structures.

The distinctions in language structure between English and Chinese are reflective of the underlying disparities in their cognitive thinking patterns (Yitong 2020). This chapter endeavors to undertake a preliminary examination of Chinese-English contrasts within a predefined framework.

Morphology Level

The study of morphology (word formation) commences with an in-depth analysis of double-word compounds, given their prominent role in the composition of compound words in both English and Chinese. From a contrastive perspective, Chinese-English double-word compounds can be categorized into two distinct groups. One category exhibits limited commonality between the two languages, exemplified by words composed of parallel structures in Chinese, such as "*kai guan* (switch)". This category is notably infrequent in English. Additionally, Chinese words containing quantifiers, like "*shu ben* (book)", lack a direct equivalent in English, as the English language typically lacks quantifiers. The second category encompasses Chinese and English compounds that demonstrate structural relationships, highlighting a correspondence between the two languages.

Structurally, compound words can be divided into five categories: Subject + Predicate Structure, Verb + Object Structure, Attributive Structure, Complement Structure, and Preposition + Object Structure. Besides, there is also the word order of the same modifiers.

Subject + Verb

In Chinese, if any given FCS has such structure: the former etyma is the object of narration while the latter one acts as the statement of the former, it is defined as the structure of "subject+predicate". For example,

Table 1: Subject+Verb

Chinese	*地震*	*春分*	*民为邦本*
English	*sunshine*	*rainfall*	*headache*

Verb + Object

This kind of expressions encompass an entyma signifying action or behaviour and the other concerning the objective of them. For instance,

Table 2: Verb+Object

Chinese	*进口*	*得意*	*开心*
English	*breakfast*	*cut-throat*	*scarecrow*

Attributive Structure

The attributive structure in Chinese is defined as the former part plays a role in modifying or limiting the latter part of a FCS. In such a structure, the latter is at the core of the meaning and the attribute acts as a premodifier. Words used as attributes are usually adjectives or nouns. For example.

Table 3: Attributive Structure

Chinese	*伟大复兴*	*极限施压*	*雪白*
English	*blacklist*	*hothouse*	*redcap*

Inner Word Order of the Same Modifiers

In English sentences, the conventional placement of adverbial adjuncts within a predicate involves situating the adverbial adjunct of time subsequent to the adverbial adjunct of place. Conversely, in Chinese sentences, this order is reversed. Besides, In the internal arrangement of time and place gerunds, Chinese follows a sequence from largest to smallest, whereas English adheres to the opposite order.

Illustratively, the English sentence “He hailed from the Department of the International Chinese Studies of East China Normal Universities in Shanghai, China in 1998.” finds its Chinese counterpart as “1998 年，他自中国上海华东师范大学对外汉语系来。” Here, the adverbial adjunct of time precedes the adverbial adjunct of place, signifying a syntactic disparity between English and Chinese structures. This observation underscores the importance of recognizing and accounting for such syntactic nuances in cross-linguistic analysis and translation efforts.

Complement Structure

In this structure, the latter part of a compound word is used to explain and supplement the former part. The modifiers are often used to explain the degrees of the adjectives. For instance.

Table 4: Complement

Chinese	*前途光明*	*万众一心*	*规模宏大*
English	*feedback*	*setback*	*breakthrough*

Preposition + Object

In such a structure, a word is formed through a preposition plus a object. For example.

Table 5: Preposition+Object

Chinese	*当面*	*对头*	*在职*
English	*inland*	*overcoat*	*downtown*

From a nuanced examination of word order, the instances mentioned earlier elucidate standard positions within a sentence. Contrarily, configurations deviating from these conventions are designated as reversed orders. Remarkably, such reversed orders are seldom encountered in Chinese but exhibit a more prevalent occurrence in English.

Phrase Level

As discerning the disparities in phrases, clauses, and sentences in Chinese proves challenging, our approach begins with an examination of English structures to facilitate contrastive analyses.

Juxtaposition

The structure comprises two parts that possess either the same, synonymous, relative, or antonymous meaning. For instance, in expressions such as “高低” (high and low), “上下” (up and down), and “老幼”(old and young), the word orders are consistent. However, in examples like “大小”(small and large), “东北”(northeast), and “前后”(back and forth), their word orders are inverted. This distinction merits attention, particularly in the context of machine translation.

Multiple Concurrent Modifiers

In the Chinese language, modifiers are often referred to attributive words or clauses and the attributive structure consistently positions itself before both subjects and objects. In contrast, English exhibits a more flexible attributive structure. In English, adjectives, numerals, or participles employed as attributives are typically situated preceding the key noun. Conversely, when prepositional phrases and attributive clauses serve as modifiers, they are conventionally placed following the key noun.

Illustratively, in the Chinese expression “在屋子的人” (a man in the room), the attributive is anterior to the central noun “人”(man). In English, the appropriate translation adopts the structure “a man in the house,” where the attributive is

post-positive to the central noun “man”. This contrast underscores the importance of considering syntactic variations in translation endeavors.

Clause level

It is widely acknowledged that, as a hypotaxis language, prioritizes sentence structure and form, considering subjects indispensable. In contrast, Chinese places a distinct emphasis on semantic coherence, allowing for greater flexibility in sentence construction, including the absence of a strict subject requirement. Within Chinese sentences, the thematic element, which may or may not be the subject, takes precedence as the sentence’s head, encompassing objects or other components.

A primary comprehension of the disparities between subjects and themes is crucial for English learners. In English, the subject is a foundational element, mandatory in every sentence, whereas Chinese often omits the subject, highlighting substantial differences in subject treatment. With imperative sentences being the exception, English mandates the presence of a subject in every sentence, where the predicate verb is integral and inseparable from the subject. Conversely, Chinese sentences prioritize thematic significance, consistently placing the theme at the forefront and relegating the commentary to the sentence’s conclusion.

Analyzing the English sentence “How fast you can run!” and its Chinese equivalent “你跑得真快啊！” reveals the transformation of the word order. This exemplifies the subtle distinctions in subject and theme treatment within the syntactic structures of English and Chinese.

Sentence Level

Due to the expansive nature of Chinese sentence structures, directly contrasting them to English becomes a challenging endeavor. Consequently, our approach shifts to extracting Chinese structures from English. To elucidate, we will scrutinize English adverbial clauses and their Chinese counterparts, delving deeper into the nuanced intricacies of structural arrangement in Chinese and English.

In English, the strategic placement of adverbials exhibits a high degree of flexibility. For single-word adverbial, their positioning can be orchestrated at the sentence's outset, preceding the predicate verb, or strategically placed at the sentence's conclusion, tailoring their location to the contextual demands. In the case of longer gerunds, a customary practice emerges, steering clear of mid-sentence placement and opting for prominence at the sentence’s inception or culmination. In contrast, Chinese adheres to a more standardized approach, placing adverbials systematically after the subject and before the predicate. For example, “If you put the baby down, she shall scream.” can find its Chinese translation as “孩子一放下就哭。”.

Naturally, it must be pointed out that this is a general study on contrastive Chinese-English word orders.

The Influence of Chinese-English Word Order on Translation

According to what I have discussed above, a brief conclusion of contrastive case analyses may be drawn. There is always exist the same word order of the two languages in morphology, phrase, clause, and sentence level. Regrading these, we may refer to sequential transformation when translating. As to those differ in word order, we may take the method of conversing the order.

To elucidate the fundamental patterns of word order in interlanguage transfer, this section will systematically present, in accordance with the contrastive and analytical insights outlined in chapter three, a delineation of the similarities and distinctions existing within English and Chinese sentences. This exploration extends across the realms of word formation, phrases, clauses, and sentences, meticulously elucidating the methods employed in their transfer. The ensuing table encapsulates a comprehensive depiction of these linguistic intricacies.

Table 6: A Preliminary Summary of Chinese-English Word Order

Sentence Components	Chinese	English	Difference in Word Order	Modes of Translation
Subject+ Predicate	S.+P.	S.+P.	Same	Sequential Translation
Verb+Object	V.+O.	V.+O.	Same	Sequential Translation
Attributive Structure(1)	Attributive+N.	Attributive+N.	Same	Sequential Translation
Attributive Structure(2)	N.+Attributive Phrases or Sentences	N.+Attributive Phrases or Sentences	Different	Conversion Translation

Complement Structure	S.+V.+C.	S.+V.+C.	Same	Sequential Translation
Preposition + Object	P.+O.	P.+O.	Same	Sequential Translation
Juxtaposition(1)	N1+N2	N1+N2	Same	Sequential Translation
Juxtaposition(2)	N2+N1	N1+N2	Different	Conversion Translation
Adverbial(1)	S.+A.(1)+V.+O.	S.+V.+O.+A.(1)	Different	Conversion Translation
Adverbial(2)	A.(2)+S.+V.+O. S.+V.+O.+A.(2)	A.(2)+S.+V.+O.	Both	Both
Adverbial(3) (Adverbial Phrases or Clauses)	Attributive +N.	Main Clause+Subsequent Clause Subsequent Clause+Main Clause	Both	Both

The presented table highlights the two primary approaches to translation between Chinese and English: sequential translation and conversion translation. Sequential translation involves maintaining identical sequential structures in both the source language and the translated language, ensuring that the translated text replicates the original sequential arrangement. On the other hand, conversion translation entails the reordering and adjustment of the source language to produce a translation that is not only authentic but also characterized by fluency and aesthetic appeal.

Machine translation emulates human translation by converting linguistic elements, including vocabulary, morphology, and grammatical rules, into a code stored in a computer. The translation process involves executing programmed instructions, checking dictionaries for pre-stored vocabulary information, and conducting a detailed examination, recognition, adjustment, synthesis, and output of grammatical rules. Despite progress in machine translation theories like linguistic disambiguation and word matching, models relying on phrase rules and examples still face challenges. The core issue lies in reducing the variability in language pairs, addressing concerns such as lexical labeling, verb and noun recognition, and semantic analysis. These complexities persist as formidable obstacles to achieving comprehensive translation solutions.

Hence, the insights gathered from the third chapter can inform the design of the program for translating Chinese into English. To enhance the neural network machines' proficiency in English-Chinese translation, we propose the establishment of a comprehensive database cataloging inflectional differences between the two languages, drawing from the insights discussed earlier. This initiative aims to facilitate the learning process by providing the system with a wealth of corpus information and imparting effective methods for information processing. Leveraging its robust capabilities in information collection, rule-based processing, self-adaptation, and organization, the neural network machine translation system is poised to elevate its learning level. This, in turn, contributes to an enhanced quality of English-Chinese translation through the continuous accumulation of knowledge during the learning process.

In the contemporary landscape, machine translation has undeniably achieved laudable milestones, yet it grapples with intricacies and challenges. Its integration into various domains has been notable, potentially transcending or substituting human translation. The extent of machine translation utilization hinges on the desired final product. For reference-level texts, where the aim is to garner fundamental information and the translation may be selectively incomplete for reader reference, machine translation can assume a prominent role, complemented by meticulous post-translation editing. However, this editing demands the expertise of industry translators specializing in the relevant field. In the case of regular-level texts, such as operation manuals demanding unwavering fidelity to the original text and precise terminology, a judicious fusion of machine translation and translation memory is conceivable. Post-translation editing remains a critical aspect, addressing sentences with marginally compromised readability. As for publication-level texts designed for official release and necessitating faithful, fluid, and even elegant translations, the task currently remains the exclusive purview of highly skilled human translators.

In this context, my endeavor is to construct a comprehensive flow chart elucidating the application of contrastive studies in advancing the realm of machine translation in Chinese.

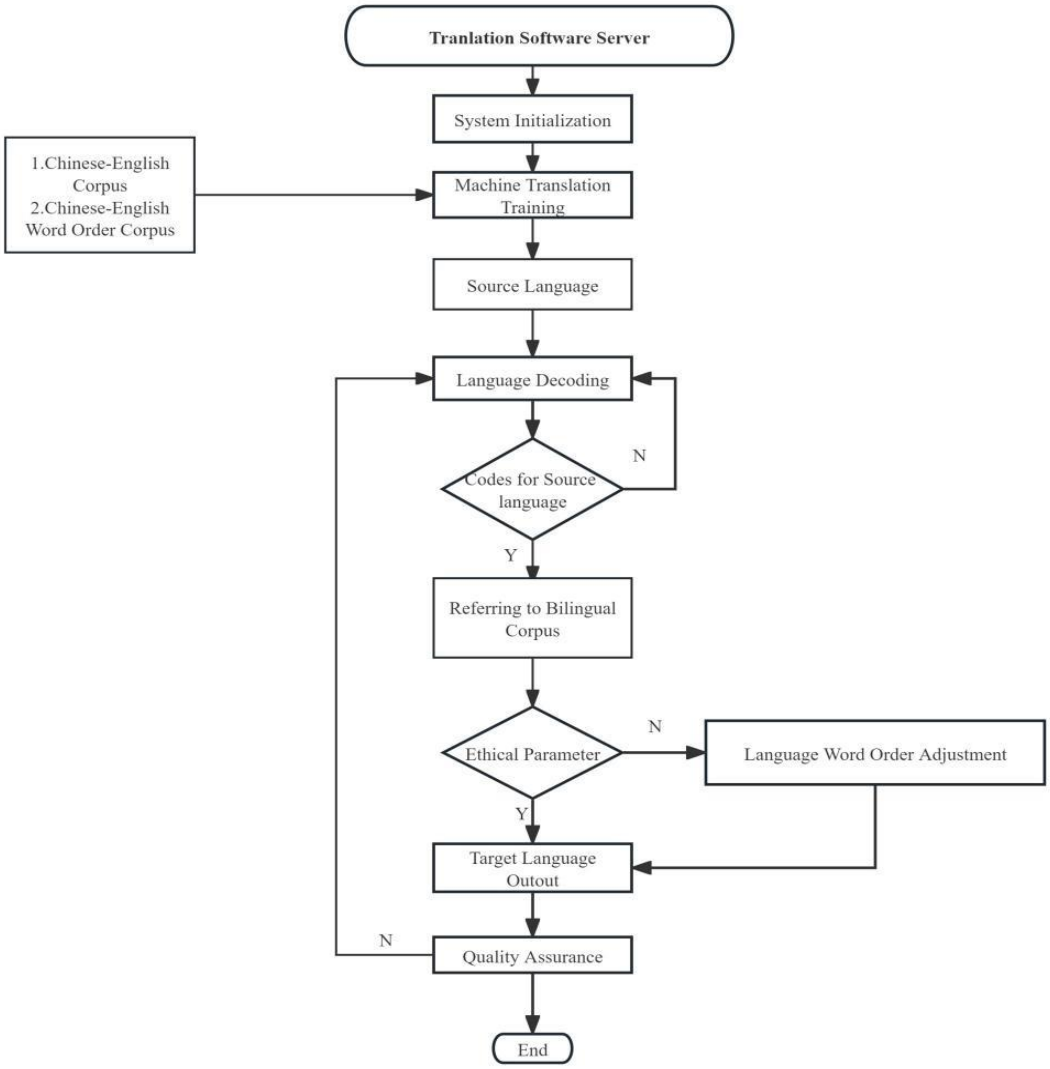

Figure 1: Machine Translation Concept Flow Chart

CONCLUSION

The disparate cultural underpinnings of English and Chinese give rise to distinct linguistic expressions. Through an intricate contrastive study, this paper meticulously dissects word order nuances between English and Chinese, exploring four categories: morphology, phrase, clause, and sentence. This analysis serves as a guide, offering new insights into machine translation with summarized laws and principles, and aiding English learners in transcending Chinese linguistic influences, thereby enhancing their command of the English language.

From the points discussed above, several conclusions can be drawn. Attributive phrases or clauses in English serve to modify nouns or pronouns, creating post-positional determiners guided by words like relational pronouns and adverbs. In contrast, Chinese lacks a direct equivalent to the “attributive clause” in English and does not possess relative words to guide such clauses. Relative words in Chinese can be omitted when serving as objects in subordinate clauses. Consequently, an English sentence with a definite article may be expressed as two independent sentences in Chinese. In English, both definite and indefinite articles are typically positioned before other modifiers. Regarding adverbials, Chinese places them after the subject and before the verb, while in English, they are positioned after the object of the verb.

It is observed that, following the contrastive analyses, there are two approaches to translation: sequential translation, which involves preserving identical word order in both the source language and the translated language, ensuring the translated text mirrors the original sequential arrangement; conversion translation, on the other hand, entails reordering and adjusting the source language to create a translation that is not only authentic but also exhibits fluency and aesthetic appeal. Additionally, a flow chart has been devised to enhance correctness and proficiency of machine translation.

However, this paper focuses on a specific aspect of the Chinese and English contrast and its implications for machine translation. In semantic-type languages, the collocation of meaning emerges as a paramount and foundational mechanism for determining the arrangement of language units. This establishes logic as the "thread" weaving together individual phonetic-semantic chunks into a cohesive structure, akin to linking distinct pearls into a unified whole. Furthermore, micro-level investigations could delve into the position of nouns and their modifiers or determiners. It could be asserted that Chinese exhibits the highest degree of logicality among all languages globally, a characteristic determined by its fundamental linguistic traits. Future studies may adopt a macro perspective, exploring chronological order (succession law), spatial order (a law of the priority of the large), mental/psychological order (from the most important to the least, a law of importance/weight), and an order of the course of happenings (a law of cause-effect/causal law).

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