Journal of Education and Culture Studies
ISSN 2573-0401 (Print) ISSN 2573-041X (Online)
Vol. 10, No. 2, 2026
www.scholink.org/ojs/index.php/jecs

Original Paper

Research on E-C Translation of Sci-Tech Texts from the Perspective of Translation Shifts Theory: *A Case Study of Agentic Artificial Intelligence: Harnessing AI Agents to Reinvent Business, Work, and Life*

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Received: March 21, 2026 Accepted: April 23, 2026 Online Published: April 27, 2026

doi:10.22158/jecs.v10n2p22 URL: http://dx.doi.org/10.22158/jecs.v10n2p22

Abstract

Agentic AI is emerging as a core driver of technological change, yet the systematic introduction of key English works in this field still faces linguistic and cultural barriers. From the perspective of Catford's translation shifts theory, this study conducts a case analysis of the English-Chinese translation practice of Agentic Artificial Intelligence: Harnessing AI Agents to Reinvent Business, Work, and Life. It explores how the translator employs strategies such as level shifts and category shifts to achieve natural expression in the target language while ensuring the accurate transmission of specialized information. The findings show that the proper use of level shifts and category shifts can effectively enhance the readability and naturalness of sci-tech translation. This study aims to verify the guiding value of Translation Shifts Theory in English–Chinese sci-tech translation, and it also hopes to provide useful references for the Chinese translation of other similar cutting-edge literature.

Keywords

Translation Shifts Theory, Sci-tech Translation, Agentic AI, Translation Methods

1. Introduction

As artificial intelligence technologies keep integrating into modern industrial production and people's daily life, the cross-linguistic transmission of sci-tech literature has become a key part of promoting global knowledge sharing and international technological cooperation. Sci-tech translation has two core demands, on the one hand, it can realize the error-free delivery of professional and technical information,

on the other hand, it needs to make expressions fully fit the linguistic norms and stylistic conventions of the target language. Catford's translation shifts theory offers a systematic and workable framework for this process, and its core idea is that semantic equivalence should be given priority over formal correspondence (Catford, 1965).

Guided by Catford's translation shifts theory, this paper chooses the first two chapters of the book *Agentic Artificial Intelligence: Harnessing AI Agents to Reinvent Business, Work, and Life* as the research case. It makes a deep analysis of the specific application ways of level shifts and category shifts in two core parts of sci-tech translation, including the standardization of professional terminology and the syntactic reconstruction of long and complex sentences. Based on these research results, this paper explores practical and effective translation strategies to improve the readability and idiomaticity of the target text, and hopes to provide useful references for the Chinese localization of other cutting-edge sci-tech literature in the same field.

2. Overview of Translation Shifts Theory

Translation Shifts Theory was put forward by J.C. Catford in 1965 and he defined translation as "the replacement of textual material in one language by equivalent textual material in another language" (Catford, 1965). This theory is based on Halliday's systemic functional grammar, and it also studies translation from the perspective of applied linguistics. Catford explained translation shifts in a specific way, referring to them as "departures from formal correspondence in the process of going from the source language to the target language" (Catford, 1965). The core of this theoretical thought is to make a clear distinction between formal correspondence and textual equivalence. Formal correspondence means that a linguistic category in the target language can match the relevant category in the source language as closely as possible in terms of linguistic form, textual equivalence, on the other hand, refers to the equivalent relationship between a specific source text and its target text in a given practical context. Catford pointed out that in real translation practice, it is usually impossible to maintain both formal correspondence and textual equivalence at the same time, and when such a situation occurs, we need to adopt "shifts" to realize the equivalence of texts. On this basis, he classified translation shifts into two main types, namely level shifts and category shifts.

Level shifts take place when "a source-language item at one linguistic level has a target-language translation equivalent at a different level" (Catford, 1965). Catford divides linguistic levels into four main types, they are grammar, lexis, phonology, and graphology. In actual translation practice, shifts between phonology and graphology are hard to carry out, so the only practical way for level shifts in translation is between grammar and lexis. This shift can only go in one direction, it runs from the grammatical level of the source language to the lexical level of the target language. This is because languages like English often express meanings through grammatical forms, but Chinese does not have these grammatical devices, and it has to rely on lexical means to deliver the same semantic information.

Category shifts are defined as linguistic transfers that depart from the formal correspondence between

the source language and the target language during the translation process (Catford, 1965), and this means that even if the source language and the target language can't match with each other in linguistic form, we can still reach the goal of semantic equivalence in the translation. Catford goes on to divide category shifts into four smaller types, these are structure shifts, class shifts, unit shifts, and intra-system shifts. Structure shifts are the most widely used kind in translation, and they refer to the changes of syntactic structure at the same grammatical rank in the whole translation process. Class shifts are related to the changes of word class or part of speech in translation, English usually has a static expression style, and it often uses nouns, adjectives and prepositions in texts, while Chinese is more inclined to a dynamic style, and it mainly depends on verbs to express complete meanings. Unit shifts will come up when a linguistic unit of a certain rank in the source language is turned into a linguistic unit of another different rank in the target language. Catford sorts these linguistic units from the smallest to the largest in order, they are morpheme, word, group, clause and sentence. The Chinese language usually has loose sentence structures, and it tends to use short or medium sentences with simpler forms, while written English is often longer and more complicated, and it also relies on many intertwined clauses and formal connecting words in its expression (Lian Shuneng, 2011). Intra-system shifts often show up when the source language and the target language have roughly matching structural systems, yet translators still need to pick out terms that do not correspond directly inside the target language system. That is to say, when a concept in the source language has no completely equivalent expression in the target language, translators can choose free translation or other proper methods according to the specific context of the text.

English and Chinese scientific texts have obvious differences in sentence structure, word classes and logical organization, so the translation shifts theory is suitable for the sci-tech translation. Zheng Shuming and Cao Hui (2011) carried out case analysis and found that structure shifts and unit shifts have very high practical value in English-Chinese sci-tech translation work, Yi (2022) took petroleum sci-tech texts as the research case and proved that category shifts can work effectively in dealing with terminology translation and sentence restructuring, Liu and other researchers (2025) applied the shifts theory to petroleum sci-tech translation in a further way and pointed out that class shifts and intra-system shifts can effectively make the target text more natural. In the international research field, Alzain and his team (2024) made a comparison between machine translation and human translation in scientific texts and found that the proper use of category shifts is one of the key factors to improve the quality of human translation.

3. Case Analysis

3.1 Level Shifts

According to Catford, level shifts mainly occur between the lexical and grammatical levels. Because English uses inflectional morphology and syntactic markers to express tense, aspect, and number, while Chinese has no parallel grammatical apparatus, translating English scientific texts into Chinese often requires lexical items to compensate for these structural differences. Based on the translation practice of

this book, level shifts in sci-tech translation are mainly seen in shifts of plural forms and shifts of tenses.

Example 1:

ST: Hundreds of vendors are already offering agent platforms, while both startups and major companies are racing to develop AI agents across industries.

TT: 目前已有数百家供应商推出智能体平台，与此同时，无论是初创企业还是大型公司，都在各行业加速布局 AI 智能体的研发。

In this source sentence, the plural meanings of vendors, startups, companies and industries are all shown by the grammatical suffix "-s", the translator does not choose to match every plural marker in a formal way, but uses level shifts to move these plural meanings to the lexical level of Chinese. To be specific, the quantifier "数百家" and the scope modifier "各行业" can clearly show the plural meaning of the original nouns, this way can not only restore the quantity and scope features of the subjects in the source text in an accurate way, but also fit the natural expression habits of Chinese sci-tech writing, and it can avoid the awkward feeling that comes from translating plural markers word for word.

Example 2:

ST: "In 2022, we were working with a global manufacturing company that was struggling with customer service efficiency."

TT: "2022 年，我们曾与一家全球制造企业合作，该公司正处于客户服务效率低下的困境。"

The English clauses "were working" and "was struggling" both employ the past continuous tense, a grammatical construction that fuses temporal location with progressive aspect. Chinese offers no parallel inflectional mechanism. The translator resolves this through a clean distribution of lexical cues: the adverb "曾" absorbs the past-time reference of "were working", while the phrase "正处于" reproduces the durative, in-progress quality of "was struggling". This shift from the grammatical level to the lexical level fully retains the original temporal logic, while keeping the translation natural and consistent with the stylistic norms of Chinese sci-tech writing.

3.2 Category Shifts

Category shifts mean the changes that happen at the grammatical category level, and they take place when translators give up strict formal correspondence between the source language and the target language just to reach real contextual textual equivalence in the whole translation process. (Catford, 1965). Catford further divides category shifts into four subtypes: structure shifts, class shifts, unit shifts, and intra-system shifts.

3.2.1 Structure Shifts

Structure shifts are the most frequently used subtype of category shifts, referring to changes in word order within the same grammatical rank. Structure shifts between English and Chinese mainly include: switching between active and passive voice; shifting between affirmative and negative expressions; and the contrast between subject-prominent English sentences and topic-prominent Chinese sentences (Zheng Shuming & Cao Hui, 2011).

Example 3:

ST: A five-level framework has been established to evaluate Agentic AI systems.

TT: 研究已建立一套五级框架，用于评估代理式人工智能系统。

The source text uses the passive voice “has been established” to emphasize the objective result of the research, which is typical in formal scientific writing. Since Chinese prefers active and concise expressions, the translator converts the passive structure into an active Chinese clause. This structural shift not only retains the original objective tone but also makes the statement more natural and readable for Chinese readers.

Example 4:

ST: Understanding this history isn’t just academic; it reveals why the shift to Agentic AI represents such a profound opportunity.

TT: 理解这段历史不仅具有学术意义，它更揭示了为何向代理式人工智能的转变代表着如此深远的机遇。

The source text uses the negative form “isn’t just academic” to show a progressive meaning, the translator does not keep the negative structure in a literal way, but changes it into the affirmative progressive structure “不仅具有学术意义” in Chinese, this expression can be more smooth and also fit the rhetorical patterns of Chinese. At the same time, the logical contrast of “isn’t just… it reveals…” in the original text is adjusted into the common progressive pattern “不仅…更…” in Chinese, it can strengthen the logical coherence of the sentence and will not change the original meaning at all. This structure shift can realize the natural expression of the text, and it can also keep the full accuracy of the translated content all the time.

3.2.2 Class Shifts

Class shifts are related to the changes of word class or part of speech in the whole process of translation. English scientific texts are much inclined to use nominalization, that is to change actions and processes into abstract noun phrases, Chinese, on the other hand, likes to use verbs to express various actions, and this brings about a more dynamic and clause-oriented rhythm of expression. So when we translate English scientific materials into Chinese, it will often bring about the use of class shifts, especially the shift from English nouns and adjectives to Chinese verbs and adverbs.

Example 5:

ST: The optimization of multi-agent collaboration and the customization of agent capabilities are key factors driving the widespread adoption of Agentic AI in enterprise settings.

TT: 优化多智能体协作、定制智能体能力，是推动代理式人工智能在企业场景中广泛应用的关键因素。

The source text relies on nominalized structures “optimization” and “customization” as the grammatical subjects, which is typical of the noun-centered, static style in English scientific writing. Through class shifts, the translator converts these English abstract nouns into corresponding verb phrases in Chinese: “优化多智能体协作” and “定制智能体能力”. By restructuring the nominal subjects into parallel

verb-object constructions, the translation follows the dynamic, verb-oriented pattern of Chinese. This shift not only preserves the full technical meaning but also produces a tighter, more direct expression that meets the concise and efficient stylistic requirements of scientific and technical texts.

Example 6:

ST: They were fragile—if a single screen changed or an exception occurred, the robot would get confused.

TT: 它们的容错性很差，一旦界面稍有变化或出现异常，机器人就会陷入混乱，无法工作。

The adjective “fragile” describes the robots’ susceptibility to failure. A direct adjectival translation “它们是脆弱的” would be grammatically acceptable but stylistically flat. The translator opts for a class shift, rendering “were fragile” as “容错性很差”. The adjective is unpacked into a noun phrase modified by an adjectival predicate. More importantly, the quality of fragility is reframed in terms of a functional attribute, which is more precise and idiomatic in technical Chinese. The shift from adjective to noun phrase represents a class transformation driven by the target language’s preference for concrete, property-based description over abstract quality attribution.

3.2.3 Unit Shifts

Unit shifts occur when a linguistic unit at one rank in the source language is translated by a unit at a different rank in the target language. Catford’s rank scale proceeds from morpheme to word to group to clause to sentence. English scientific writing frequently packs information into complex groups and embedded clauses, which must often be unpacked into separate clauses or sentences in Chinese. Conversely, English sentences may be compressed into Chinese phrases when the informational load permits.

Example 7:

ST: AI agents can maintain consistent action over time to achieve predefined goals without human intervention.

TT: AI 智能体具备续航性，无需人工干预即可达成预设目标。

The verb phrase “maintain consistent action over time” can convey the core meaning of sustained and stable operation, and with the help of unit shifts, the translator simplifies this descriptive phrase into the concise technical term “续航性” in Chinese. This change from a multi-word phrase to a single noun can make the whole expression more simple, and it can also keep the original meaning of the text completely, it can also fit the concise and terminological style of Chinese sci-tech texts well, and it can lift the professionalism and readability of the translated content at the same time.

Example 8:

ST: Analyzing the puzzle, the LRM showed systematic reasoning.

TT: 在分析这道难题的过程中，大推理模型展现出了系统性的推理能力。

The source text uses the participial phrase “Analyzing the puzzle” as an adverbial of time, which is a compact phrase-level structure typical in English. The translator expands this phrase into a full temporal clause in Chinese: “在分析这道难题的过程中”. This upgrade from phrase to clause clarifies the temporal and logical relationship in the sentence. The restructuring not only preserves the original

meaning precisely but also conforms to the paratactic preference of Chinese scientific writing, making the logic more explicit and the expression smoother.

3.2.4 Intra-system Shifts

Intra-system shifts often come up when the source language and the target language have roughly similar formal structures, but translators still need to choose some terms that do not match directly in the target language system in the actual translation process. (Catford, 1965). Many words in the source text that relate to culture and society can be categorized as intra-system shift.

Example 9:

ST: RPA became popular because it targeted low-hanging fruit: all those mundane, rules-based tasks that office workers repeatedly do.

TT: RPA 的流行，在于它瞄准那些容易实现的目标：办公室里日复一日、有章可循的重复性工作。

The literal meaning of "low-hanging fruit" is "低垂的果实", but in this specialized sci-tech business context, it lacks a fully equivalent formal counterpart in Chinese. Following the principle of intra-system shift, the translator abandons formal correspondence and instead adopts a semantically equivalent Chinese expression, rendering it as "容易实现的目标". This way can clearly and accurately show the core practical meaning of the original text. It also fits the writing style and norms of formal Chinese sci-tech texts well, and it can effectively avoid the unclear meaning and reading barriers that may be caused by stiff word-for-word translation.

Example 10:

ST: For enterprises, Agentic AI is not just a nice-to-have tool, but a must-have core competitiveness to stand out in the fierce digital competition.

TT: 对企业而言，代理式人工智能并非锦上添花的工具，而是企业在激烈的数字化竞争中脱颖而出的必备核心竞争力。

This example mainly centers on the compound jargons "nice-to-have" and "must-have" in the cross field of AI technology and business, and this is also a core application scene of intra-system shifts. Even though the system of the target language has roughly corresponding formal positions for these kinds of modifiers, the translator will not adopt rigid and mechanical literal translation, he will pick out the words in the same semantic field that have stronger rhetorical power and better cultural resonance in Chinese business expressions, they are the idiom "锦上添花" and the word "必备". This kind of shift can keep the original logical contrast in an accurate way, it also conforms to the stylistic norms of Chinese sci-tech texts, and it can make readers with different professional backgrounds understand the content clearly and easily.

4. Conclusion

This study takes Catford's Translation Shifts Theory as its main analytical framework, and it carries out a systematic and empirical analysis of the English-Chinese translation practice of the first two chapters of Agentic Artificial Intelligence: Harnessing AI Agents to Reinvent Business, Work, and Life, which is

a cutting-edge work in the field of Agentic AI. The research results show that Translation Shifts Theory can provide a complete and practicable solution to solve the core contradiction between formal correspondence and textual equivalence in English-Chinese sci-tech translation. In the use of level shifts, translators turn the grammatical meanings in English into lexical expressions in Chinese, and this can make sure the accurate transfer of semantic information and make the translation fit in with the writing norms of Chinese technical texts. When it comes to category shifts, the four strategies of structure shifts, class shifts, unit shifts and intra-system shifts can deal with the differences in syntax, lexicon, sentence structure and terminology between English and Chinese, and this can greatly improve the fluency and readability of the target text while still keeping the precise professional information of the original text. This study proves the high applicability of Translation Shifts Theory in English-Chinese sci-tech translation, it enriches the empirical research on the translation of AI-related texts and provides some practical strategies for translating cutting-edge sci-tech works in an accurate and natural way. The research results can also help to promote the cross-linguistic spread of global technical knowledge, and push for more smooth international academic and industrial communication and cooperation.

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