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The Application of Zwart's Shift Model to the English-Arabic Translation of Technology News

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Abstract:

The present research paper discusses the applicability of Zwart's "Comparative–Descriptive Model of Translation Shifts" (1984) to translating Sci-Tech news from English into Arabic. This comprehensive model primarily investigates the translation shifts occurring in literary discourse. To the best of the researcher's knowledge, very few attempts have been made to apply this shift analysis-based model to the translation of other types of discourse.

The paper applies this model to translating scientific discourse, particularly technology news, on several reliable news websites, such as BBC and CNBC. English news on the English websites (ST) and the Arabic translation (TT) on these websites are used as data for the comparative and descriptive analysis.

Zwart's comparative model describes the translation shifts on the microstructural level by comparing the architranseme and the SL and TL transoms.

The descriptive model provides insights into the shifts on the macrostructural level.

The paper concludes that shifts occurring in the translation of Sci-Tech news can be best described, analysed, and categorised within Zwart's comparative model. It also concludes that shifts on the microstructural level do not necessarily lead to a noticeable macrostructural change in the primary language metafunctions (interpersonal, ideational, and textual) as in the translation of literary works. Syntactic shifts may, however, result in a macrostructural change of the textual metafunction, which alters the propositional content in some instances.

Keywords: Sci-Tech, Comparative, Descriptive, Microstructural, Macrostructural

تطبيق نموذج زوارت ألتحويلي في الترجمة الإنجليزية العربية للأخبار التكنولوجية

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الملخص:

تناقش هذه الدراسة البحثية إمكانية تطبيق "نموذج زفارت الوصفي المقارن لتحولات الترجمة" (١٩٨٤) لترجمة أخبار العلوم والتكنولوجيا من الإنجليزية إلى العربية. ويبحث هذا النموذج الشامل في المقام الأول في تحولات الترجمة التي تحدث في الخطاب الأدبي بشكل عام. وعلى حد علم الباحث، لم تكن هنالك سوى محاولات قليلة جدًا لتطبيق هذا النموذج القائم على تحليل التحولات الترجمية على ترجمة أنواع أخرى من الخطاب.

وتطبق الورقة هذا النموذج على ترجمة الخطاب العلمي وخاصة أخبار العلوم والتكنولوجيا، على العديد من المواقع الإخبارية الموثوقة مثل بي بي سي وسي إن بي

سي. حيث يتم استخدام الأخبار الإنجليزية على المواقع الإنجليزية (ST) والترجمة العربية (TT) على هذه المواقع كبيانات للتحليل المقارن والوصفي.
يصف نموذج زوارت المقارن التحولات التي يمكن أن تحدث خلال عملية الترجمة على المستوى الهيكلي الدقيق من حيث المقارنة بين تركيب المحتوى الدلالي العام وتركيب المحتوى الدلالي الخاص باللغة الاصل واللغة الهدف، حيث يقدم النموذج الوصفي رؤى حول التحولات على مستوى البنية التركيبية الكلي.
وتخلص الورقة إلى أن التحولات التي تحدث في ترجمة أخبار التكنولوجيا يمكن وصفها وتحليلها وتصنيفها بشكل أفضل ضمن اطار نموذج زفارت المقارن. كما تخلص الدراسة أيضا إلى أن التحولات على مستوى البنية التركيبية الدقيقة لا تؤدي بالضرورة إلى تغيير ملحوظ في وظيفة اللغة الدلالية الشاملة المتمثلة بالوضائف الثلاث الشخصية والفكرية والنصية. من جهة أخرى، فأن التحولات النحوية من الممكن أن تتسبب في احداث تغيير على مستوى البنية التركيبية الكلية في وظيفة اللغة النصية على وجه التحديد، الامر الذي قد يقود في بعض الحالات الى تغير في المحتوى الدلالي النصي.

المصطلحات المفتاحية: العلوم والتكنولوجيا، المقارن، الوصفي، البنية التركيبية الدقيقة، البنية التركيبية الكلية .

1. Introduction

The rapid progress of science and technology throughout the world is dazzling. It is revolutionising every single domain in our public lives. Technology news, with its significant role in introducing a vast amount of hard-to-discard, added information and facts in many branches of applied science, not only disseminates knowledge but also, through your translations, plays a crucial role in shaping public attitudes and conceptions of science and technology in the communities.

As Sager points out, the more advanced and technical the scientific texts, the more complex and challenging the scientific translation. Maintaining scientificity and accuracy in translation tests the translator's intellectual rigour and ability to highlight the importance of transferring facts and knowledge as accurately as possible in science and technology news (1990: 95-96).

Translators are crucial in bridging the gap between different languages and cultures. Your understanding of the unique technical characteristics of scientific language, such as its precision and specificity, and your ability to convey the main ideas and facts in the target terminology and phraseology are essential for effective communication in science and technology news.

2. The Function and Structure of Sci-Tech News Texts

According to Newmark's comprehensive text typology (1988), form and content determine the function of a text. Generally, texts may have one or two functions: expressive, informative, vocative, aesthetic, phatic, and metalingual (1988:40-41). Each text function is rendered using a specific method based on the translation requirements that ensure the SL text's truth, accuracy, appropriateness, and faithfulness. The first three functions are the most common in language use described concerning two main aim-fulfilling translation methods, i.e. semantic and communicative translation. Newmark argues that semantic translation can render texts with expressive and communicative functions to render informative and vocative texts and adequately convey meaning (1988:206).

Sci-Tech publications (textbooks, reports, scientific periodicals, etc.), broadcasts, or published news in newspapers mainly focus on knowledge- transfer and generally follow a standard, non-emotive, and formal format. They are characterised by a marked use of present tenses and perfect aspects, passive voice, multi-compound words, Graeco-Latin terms, no metaphors, deverbals, and equative verbs (Newmark, 1988:159).

Sager et al. (1980: 54-57) show that the language scientists and researchers use to publicise and market their products is not restricted to the scientific and technological vocabulary already

explained in specialised lexicography, terminological dictionaries, and electronic terminology-management systems. Felber and Budin (1989: 140-143) highlight the importance of discourse-specific terminology. They also show that linguistic expectations, conventions, and constraints vary from one linguistic community to another based on their distinctive association with each particular text variety.

For Byrne (2006), the linguistic preference ranges from specific syntactic structures to idioms, collocations, and formality. For instance, in British technical writing, passive constructions and nominalised verbs are preferred (Sager et al. 1980, Ahmad and Rogers 2001). In contrast, expressive verbs are more commonly used in American technical writing to express reproducible findings (Byrne, 2006: 165-167).

3. The Translation of Sci-Tech Texts

In principle, rendering scientific (informative) texts is not an easy task, as many may assume, because of the universal nature of the scientific language. It necessitates full adherence to the truth, scientific procedures, and factual results, focusing on potential consequences. In 1961, Jumpelt presented a choice-based approach to translating scientific and technical texts. The approach assumes free-to-make "subjective" choices and obligatory or likely "obligatory" objective choices determined by the TL indicators that turn specific grammatical constructions, morphological formulations, shifts, or transpositions compulsory or likely compulsory (ibid.: 175). Focusing on the TL lexical and grammatical obligatory shifts, Jumpelt asserts simplicity, clarity, and precision as prerequisites for a successful scientific and technical translation. He connects stylistic choices with the TL and equivalence with the context of the situation (Jumpelt, 1961: 169-171).

With a shred of functionalist evidence, Finch presented "An Approach to Technical Translation" in 1969. Finch argues that literary translation is more complex than technical translation and that perfect technical translation is feasible 'by clarifying and avoiding clumsy phrases' (1969: 3–5). Maillot, on the other hand, prioritises precision and rigorousness over terminological and linguistic factors as quality determinants to validate extendable rules for scientific and technical translation (1981: 3).

Newmark (1988:209) explains that texts in science are typically concept-oriented, but they are object-oriented in technology. Accordingly, the translator is required to investigate the essential components of the SL text, considering the divergence between the two languages. The translator can act freely to process the SL grammatical structures into the TL, such as resorting to lexical or class shift (transposition), but must be very accurate and precise to render the SL text terminology and jargon (ibid).

Scientific and terminological knowledge is highlighted as a prerequisite for successful translation activity in the scientific and technological discourse. This particular type of knowledge is beneficial when summarised and presented in a translation-based organisation (Hann, 2004:56-59). In 2006, Byrne suggested a new approach to scientific translation, focusing more on the targeted audience's readability and usability than on Sci-Tech texts' terminology and structure (ibid:126). Olohan (2013) says that related disciplines, such as the sociology of science, the rhetoric of science, etc., may provide science translators and researchers with the proper tools to assist them in their tasks (2013: 433).

In conclusion, translators of Sci-Tech texts should maintain an appropriate level of compromise that mitigates the discrepancies between SL and TL conventions and meets the end-user expectations. In addition, the more scientific the text composition

is, the greater the technical and scientific knowledge the translator needs to complete his task.

4. Zwart's Model of Translation Shifts

Drawing on several basic comparative categories proposed earlier (Vinay, Darbelnet, and Levý, 1995), Zwart presented her model in 1988 to provide a comparative and descriptive framework for translating fictional texts. The model suggests some translational guidelines for the translator to follow within a discourse structure (Zwart, 1989: 155). The model falls into two main parts:

1- The comparative part of the model comprehensively compares the ST and TT within a microstructural shift framework. The framework comprises comprehensible textual units: Architranseme, ST transeme, and TT transeme. The units are grammatically, semantically, and pragmatically compared to establish a comparative relationship which may fall into one of the proposed subcategories (modification, mutation, and modulation) (ibid: 157). The synonymic relationship indicates no shift, whereas hyponemic one refers to one of the three main shift categories of modulation, modification, or mutation.

2- The descriptive part concerns the macrostructural framework of shifts in literature translation. It is the relationship between the discourse level (fiction) and the three primary language metafunctions (interpersonal, textual, and conceptual) interweaved with Leech and Shorts' basic discourse concepts (1981). All shift occurrences at the microstructural level are assumed to lead to changes at the metafunction level (Zwart 1989: 171–179). In a previous study, for instance, it was found that syntactic–pragmatic modulation shifts occurring on the microstructural level may have led to a change in the

interpersonal metafunction of the macrostructural level in the translation of fictional texts.

5. Data Collection

The data are collected from BBC News (https://www.bbc.com/news/technology/) and CNBC (https://www.cnbc.com/technology/) on their English and Arabic websites. The extracts are taken from Sci-Tech news on the latest technological inventions and events. The Architranseme, ST transeme, and TT transeme are established of the selected news extracts, which are considered "comprehensible textual units" (Zwart, 1990:87). A comparison is made concerning the main denominator (Architranseme) on the sentence clause, phrase, and lexical items (word) levels. The different types of shift occurrences are finally identified and categorised.

6. Data Analysis

Example – 1 -

ST: Equifax says a giant cybersecurity breach compromised the personal information of as many as 143 million Americans.

ART: information being compromised

STT: - Equifax: simple NP (H)

- Says: Base form + s / present tense
- A giant cybersecurity breach: A complex NP with a premodification and singular head (breach)
- Compromised: past form / past tense / active voice
- The personal information: A complex NP with a premodification and a collective noun as a head (information)
- 143 million Americans: A complex NP with a premodification and a proper noun as a head (Americans).

ST Structure: [S V O (S V O)]

No. of Content Words: 10

TT:

كشفت شركة اكويفاكس ان معلومات شخصية عن ١٤٣ مليون زبون سُرقت إثر أكبر عمليات القرصنة الإلكترونية.

TTT: كشفت: Past form / past tense

- شركة اكويفاكس: A complex NP with a premodification and a proper noun as a head (اكويفاكس).
- معلومات شخصية: A complex NP with a postmodification and an accountable noun as a head (معلومات).
- ١٤٣ مليون: A complex NP with a postmodification and an accountable noun as a head (زبون).
- سُرقت**:** Simple verb phrase/Past form/past tense/passive voice
- أكبر عمليات القرصنة الإلكترونية**:** A complex NP with premodification and postmodification and an accountable noun as a head (القرصنة).

TT Structure: [V S O (S V)]

No. of Content Words: 13

Analysis

The analysis of the above example shows some aspects of conjunction and disjunction with the architranseme. The conjunction is well manifested in complex phrases, and the subject-verb and modification-head noun concord in the VPs and NPs regarding number, gender, and tense (in specific cases). The instances of conjunction between the STT and the ART indicate that the relationship is a synonym. However, the analysis also shows that aspects of disconjunction between the TTT and the ART explain the hyponemic relationship between the two transemes. The disjunction appears in the change of style, voice, number of content words, and semantic content (proposition) of the sentence.

According to Zwart's comparative model, a translation shift arises when the relationship between the TTT, STT, and ART differ in nature. On the other hand, the shift type is defined by the nature of each relation to the ART. In this example, the primary translation shift is modulation/specification. The microstructural stylistic shift in the TT from the direct speech to the reported speech, the grammatical shift from the active to the passive and the number of content words used in the constituent NPS and VPs, and the semantic shift of some words all contribute to the syntactic-semantic type of modulation shift. However, the modulation/specification shift tends to convey more information about the ST proposition, yet inaccurately in the sense that the main verb (سُرقت) in the TTT does not convey the exact denotation of the verb (compromise) in the ART. The shift here at the microstructural level is a syntactic-stylistic modification, represented by the increased number of content words that convey the main propositional content of the ST.

Example – 2 -

ST: As many as 143 million people may have had information exposed, including addresses and social security numbers. Yahoo later admitted to an even more significant breach in 2013, in which the passwords and personal information of one billion accounts were exposed.

ART: Exposing information and breaching accounts

STT:

- information of 143 million people: Complex NP
- may have had + exposed: Complex VP (modality: probability) (present tense perfective aspect) (Passive voice)
- addresses and social security numbers: Complex NP
- Yahoo: Simple NP

- Admitted: Simple VP (past tense/simple aspect) (active voice)
- larger breach: Complex NP
- in 2013: Adverbial
- the passwords and personal info of one billion accounts: Complex NP
- were exposed: Complex VP (past tense) (passive voice)

ST structure: [S V] [S A V O (SV) A)]

No. of Content Words: 24

TT:

نحو ١٤٣ مليون عميل تعرضت بياناتهم للخطر بما في ذلك عناوينهم وارقام الضمان الاجتماعي. لاحقا اعترفت ياهو بانها تعرضت لاختراق أكبر في ٢٠١٣ حيث تم تسريب أرقام سرية ومعلومات شخصية لمليار حساب.

TTT: تعرضت / بيانات / اعترفت/ اختراق/ تسريب/ ارقام سرية/ معلومات

- نحو ١٤٣ مليون عميل: complex NP
- تعرضت: Simple VP
- بياناتهم: Simple NP
- للخطر :Simple NP
- عناوينهم وارقام الضمان الاجتماع: Complex NP
- معلومات شخصية لمليار حساب: Complex NP
- لاحقا: Adv.
- اعترفت: Simple VP
- ياهو: Simple VP
- تعرضت: Simple VP
- لاختراق أكبر: Complex NP
- في ٢٠١٣ : Ad
- تم تسريب: VP
- أرقام سرية**:** Complex NP
- معلومات شخصية لمليار حساب :Complex NP

TT Structure: [S V] [A V S O, relative Clause (V passive S)]

No. of Content Words: 24

Analysis:

The comparison between the STT and the ART is confirmed in terms of the message's propositional content, the content words' denotative meaning, the sentence's internal structure, and thematisation, which all convey the intended meaning of the ST message. The relationship between the two transemes is expressed as a synonymic one (conjunction) because the two transemes contain the same primary elements and follow a similar arrangement of the content words, i.e., the same thematic meaning.

Matching the TTT with the ART reveals obvious hyponymy in structure, the number of content words, arrangement, and thematic structure, implying a translation shift. To preserve the ST structure, the translator follows a similar structure and disregards the TL unmarked sentence structure, which typically starts with a main verb. For thematic purposes, the TT is markedly structured by the foregrounding part of the subject in the first sentence and maintained in the ST. Despite retaining the SLT structure and thematic focus, the semantic proposition defined by the ART and conveyed by the STT is not expressed by the TLT.

The shift from the passive voice in the STT verb phrase to the active in the TLT shows a shift in focus. Using agentless causative passive constructions puts more attention on the action than the recipient, which causes a deviation in the thematic structure of markedness and unmarkedness, resulting in a syntactic-stylistic modification shift. The translator could have preserved the thematic structure of the STT if he had maintained the unmarked active voice in the STT verb phrase.

The addition of (that it was exposed - **بانها تعرضت**) and the omission of (even) in the TTT add to the hyponemic relation to

the ART and, thus, lead to a translation shift. This shift on the microstructural level can be depicted as a modulation in the representation of generalisation.

Example – 3 –

ST: Google is facing action from a coalition of ten European consumer organisations over the company's account sign-up process.

ART: Facing a warning or precautionary action

STT:

- Google: Simple NP
- is facing: Complex VP
- a serious action: Complex NP
- coalition of ten European consumer organisations: Complex NP
- company's account sign-up process: Complex NP

ST Structure: [S V O PrepP AdvP]

No. of Content Words: 12

TT:

تواجه شركة غوغل للتقنية إجراءً من تحالف من عشر منظمات أوروبية لحماية المستهلكين، بشأن عملية إنشاء حساب على موقع غوغل الشهير.

TTT:

- تواجه: Simple VP
- شركة غوغل للتقنية: Complex NP
- إجراء: Simple NP
- من تحالف:PrepP
- من عشر منظمات أوروبية لحماية المستهلكين: PrepP
- بشأن عملية إنشاء حساب: PrepP
- على موقع غوغل الشهير: PrepP

TT Structure: [V S O PrepP PrepP PrepP]

No. of Content Words: 16

Analysis:

Even though there are some evident microstructural shifts in the TT, the ST and the TT match the ART as they share a synonymic proposition. The hyponemic relation between the TT and the ART can be manifested in the semantic modulation shift of generalisation of using the word "اجراء" as a literal lexical equivalence of the ST lexical item "action". The linguistic and contextual meaning of the SL lexical item "action" conjuncts with the common denominator architranseme "facing a warning or precautionary action" in a synonymic relation. However, the literal and contextual meaning of the TL equivalent disjuncts with the architranseme in a hyponemic relation. The neutrality of the TL lexical item "اجراء" poses a semantic modulation shift in terms of generalisation.

The present tense progressive aspect of the SL verb phrase (is facing) shows a conjunction relation with the architranseme, highlighting the time the action is occurring (now or around now). The match between the architranseme and the ST transeme signifies no microstructural shifts, which lies at the core of the model adopted in this study. The TT transeme, however, lacks the match with the architranseme, and the mismatch results in a microstructural shift. The SL simple verb phrase "تواجه" matches the present tense of the verb phrase in the architranseme but mismatches the aspect. Using the imperfect verb form in Arabic as a formal correspondence to the SL verb form matches the tense but needs a time exponent to show the progressive aspect. The potential time exponents here can be " الان- now" or " في الوقت الحاضر– at present", taking into consideration that the Arabic imperfect verb form can be used for simple and progressive aspects equally. The element is defined in Arabic using other

lexical times (time indicators), i.e. adverbs and adverbials of time. The syntactic modulation of this shift involves generalisation.

Example – 4 –

ST: According to Ars Technica, Google said there were 2.5 billion active devices last year - and 400 million running the latest version was only 16% of the possible install base.

ART: a small percentage of the available phones use the latest version.

STT:

- Ars Technica, Google: Simple NP
- Said, were, was: Simple VP (past tense – simple aspect)
- 2.5 billion active devices, 400 million "devices", 16% of the possible install base: Complex NP
- Last year: AdvP
- running the latest version: ing-participle clause

ST Structure: CL1[S V O(SVCA)] CL2 [S V C]

No. of Content Words: 20

TT:

وبحسب شركة آرتس تكنيكا، قالت غوغل إن ٢.٥ مليار جهاز في العالم كان يستخدم أندرويد العام الماضي، وبالتالي فإن استخدام ٤٠٠ مليون جهاز لنظام التشغيل الأحدث يعني ١٦ في المئة فقط من السوق المحتملة.

TTT:

- غوغل, أندرويد, استخدام: Simple NP
- العام الماضي: AdvP
- مليون جهاز ،شركة آرتس تكنيكا ،نظام التشغيل الأحدث ،السوق المحتملة ٤٠٠، ١٦ في المئة: Complex NP
- يعني، قالت: Simple VP

TT Structure: CL1[V S O (SVOA)] CL2 [S V C]

No. of Content Words: 25

Analysis:

The difference in the arrangement of the sentence structure constituents can be considered in terms of thematic structure rather than a mismatch with the architranseme due to the syntactic structures of the two languages (Arabic and English). However, this hyponemic relation can only be interpreted within the microstructural shift of the syntactic modulation of specification. The architranseme is established to be a matching dominator showing the similarities and differences between the two transemes of the ST and TT. In this respect, it indicates how much the two sentences are matched. The disjunction relation between the ART and the TTT suggests a shift in the level of structure and, hence, a syntactic modulation (specification).

The microstructural shifts at the level of mutation are manifested in several examples in the TT. The first manifestation is the use of the word " شركة– company", which has no word–for–word correspondence in the ST. This addition mismatches with the ART and distorts the message conveyed to the readers. This is likely attributed to the translator's lack of knowledge. Ars Technica is not a company but rather a website covering news and opinions in technology, science, politics, and society, created by Ken F. and Jon S. in 1998 (https://en.wikipedia.org/wiki/Ars_Technica).

Another example of a less-distorted effect of addition is the use of the clause "كان يستخدم أندرويد" as a dynamic equivalence of the ST lexica item "active". This rank shift disjuncts with the ART yet does not convey misleading information or cause message distortion. The lexical item "active" implicitly and anaphorically indicates that the Android software is activated in mobile phones running this software. According to Zwart's comparative model, it is considered a syntactic–stylistic modification.

The addition is also evident in the use of the complex noun phrase "نظام التشغيل الأحدث-latest operating system" in the TT to correspond to the TT complex noun phrase "latest version". Even though the word " التشغيل– operating" does not exist and the word "system" is not the formal equivalence of the ST word "version", such addition and omission cannot be seen as mutations due to the disjunction with the ART but rather as a syntactic and semantic-stylistic modification. These grammatical shifts have a mild effect on the informativity of the TT message as they have relevant rather than identical references yet are disjuncts with the ART.

The only example of totally distorted mutation is the use of the TT complex noun phrase "السوق المحتملة", which has a disjunction relation with the ART and is irrelevant to the linguistic and contextual meaning of its corresponding SL noun phrase. They match in structural complexity but have a divergent phrasal proposition. The semantic proposition of the TT mentioned above Np "**possible install base"** refers to the possible or expected download and usage base of the latest system version and not the potential or anticipated marketing of devices. Deleting the ST lexical item "in the TT maintains an even more hyponymic relation to the ART and distorts the message. The microstructural shift here can be represented as a radical change of meaning and deletion, both of which come under the umbrella of mutation.

7. Results and Discussion

1- The analysis of the selected news extracts shows that the translation process involves different types of microstructural shifts in the comparative model of Zwart due to various structural, semantic, and stylistic reasons.

2- The analysis reveals that the STT in all the selected samples matches the ART with more similarities than

differences, resulting in conjunction relations and synonymic correspondence with the main denominator.

3- The data analysis shows that the TTT in some translated samples mismatches the ART with more differences and deviations than similarities, resulting in a disjunction (hyponemic) relation.
4- The agent, tense, and word order pertinent to the active-passive voice are evident in almost all the analysed news extracts. They fall into the structural type of shift according to Catford's typology of translation shifts (1965) and syntactic modification and modulation within Zwart's comparative model (1988).
5- According to the analysis, the most noted shift is the change in the thematic meaning due to the foregrounding and backgrounding of specific thematic roles of sentence elements, leading to a syntactic-pragmatic modification.
6- Structural and stylistic changes between the STT and the TTT are evident in the sentence constituent order, number of orders, the grammatical categories of verbs in English and Arabic, the formal and dynamic equivalence, etc. According to the Zwart model, these changes induce syntactic modulation and syntactic modification equally.
7- The stylistic level is affected by the number of lexical items used in the St and its translational correspondence that conveys the intended meaning. Adding lexical items can either provide explication or distraction (distortion).
8- Despite its rareness, the analysis reveals that the disjunction relations with the ART may prompt mutational shifts caused by the deletion or addition of specific phrases or a radical change of meaning.

9- No major macrostructural shifts resulting from microstructural ones are evident in the analysis of the news extracts. There were quite a few cases in which the microstructural shifts impacted the conceptual function of the TT.

8. Conclusions

1- The obligatory and optional structural variations due to each language's linguistic idiosyncrasy induce microstructural shifts in the thematic meaning of the syntactic-pragmatic modification, as shown in the data analysis.

2- Stylistic modification and modulation are the most prevalent microstructural shifts in translating technology news.

3- The disjunction relation with the ART resulting from the deletion and addition of some linguistic content in the TT leads to mutational shifts and stylistic and semantic modulation of generalisation.

4- Most notably, Zwart's comparative model applies to translating technology news. The advantage of this model lies in its ability to categorize and define microstructural shifts and their types and effects.

5- Translation shifts occurring on the microstructural level have mild effects on the macrostructural level and the functions of scientific texts, unlike those occurring in the translation of literary texts.

6- The textual metafunction at the macrostructural level may be affected by the frequent occurrence of syntactic shifts at the microstructural level. Such a resultant effect may distort

the conveyed message due to a change in the propositional content.

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