

Language Conventions of Kurdish Scientific Books in the Context of Scientific Translation between English and Kurdish

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Abstract— This paper explores the language conventions of Kurdish Scientific Books (KSBs) within the context of scientific translation between English and Central Kurdish. The study analyses five KSBs to investigate their language characteristics, including clarity, precision, formality, use of terminology, style and so forth. The current study utilizes Lambert and van Gorp's (1985/2006) four-step scheme for analysing and describing the KSBs. The findings reveal that KSBs generally employ clear and precise language, maintain objectivity and formality, and make use of nominalization and scientific terminology. The KSBs generally favour incomplete sentences in titles and figures, and, in the body of the sections and chapters, prefer long sentences and active voice and avoid direct quotations, abbreviations, acronyms, and personal pronouns. They also incorporate English loanwords and terms to fill lexical lacunae, indicating the influence of the English scientific language. This research accordingly sheds light on the language conventions of KSBs and their potential similarities to the English scientific language.

Index Terms— Scientific translation, Language of science, Language conventions, KSBs .

I. INTRODUCTION

Language is the key component in the existence of any discipline and plays a pivotal role in structuring and disseminating information in any field of life. A poet, for example, resorts to poetic language to express his feelings and legislators usually employ formal words when they make laws. Science in particular has its language conventions. Scientists and scholars in all the subfields of science use language quite specifically when they write about any scientific topic. In this regard, Montgomery (2009), for instance, focused on the leading role of English and its peculiarities in the field of science.

Writing about scientific topics by using Central Kurdish (CK) as the language of communication is not a new practice. Kurdish academics, writers and scholars long time ago used CK to inform Kurdish readers about various scientific topics. Many scientific articles, reports, books, magazines, website sections or newspaper pages have been written in Central Kurdish, such

as “تەندروستی و کۆمەڵ” (Eng.: Health and Community) which was a medical magazine focusing on medical topics and published in 1980s. This is also true for translating scientific texts from other languages into CK. One of the genres that have been used in the Kurdish society for disseminating scientific topics to Kurdish readers is Kurdish Scientific Books (KSBs). Looking for KSBs in bookshops and libraries results in finding different titles. Finding KSBs in bookshops and libraries yields various titles. However, due to shortages in documentation, a lack of research studies, and limited printed copies, providing a precise historical account of all KSBs proves challenging, if not impossible. Pinpointing the first KSB is particularly difficult amidst these constraints.

Whether the KSBs are originally written in or translated into CK, there is a lack of resources and academic studies about the genre conventions of KSBs particularly concerning the characteristics of the language that has been used. This study therefore attempts to address this gap and aims to illustrate the language conventions of CK that have been employed in producing KSBs.

Since a certain number of KSBs are translated from other languages into CK, especially from English, and since science is studied in English at the universities of Iraqi Kurdistan, this research paper hypothesises that KSBs possess language conventions that are similar to those of the English scientific language. To substantiate this claim or otherwise reject it, this study attempts to answer these research questions:

- (1) what are the characteristics of the CK used in KSBs?
- (2) are the selected KSBs in this study originally written in CK or translated into CK?
- (3) do KSBs share the characteristics of the English scientific language?

II. SCIENTIFIC TRANSLATION AND SCIENTIFIC TEXTS

In the field of Translation Studies, scientific translation serves as a catalyst for global scientific exchange and collaboration, enabling researchers from diverse linguistic backgrounds to communicate, share knowledge, and collectively push the

boundaries of scientific discovery. It encompasses the translation of various scientific texts, including research articles, academic papers, textbooks, and other scholarly materials. The field of scientific translation requires not only linguistic proficiency but also a deep understanding of the subject matter and terminology specific to various scientific disciplines. Scientific Translation is defined as the translation of scientific and specialised knowledge (Olohan and Salama-Carr, 2011; Montgomery, 2000). Scientific translation allows researchers to access and understand scientific literature from different linguistic backgrounds, granting them the opportunity to build upon existing knowledge, replicate experiments, and engage in critical scientific dialogue. This interplay of ideas and perspectives nurtures cross-pollination of research, enhances scientific collaboration, and contributes to the advancement of scientific knowledge on a global scale. One of the primary functions of scientific translation is to bridge the gap between scientific communities that communicate in different languages. Scientific translation serves as a powerful medium for promoting cross-cultural understanding and appreciation of diverse scientific traditions.

Scientific texts serve as beacons of knowledge, illuminating the path to discovery and understanding in the vast landscape of scientific inquiry. They encapsulate the collective knowledge of scientists, unveiling insights into the natural world, technological advancements, and the intricacies of the human mind. Scientific texts in English have their own language conventions, they are characterized by their precision, objectivity, and adherence to established scientific methodologies. In addition, they employ specialized terminology, carefully defined concepts, and logical structures to convey scientific information with clarity and rigor (cf. Swales, 1990). One prominent feature of scientific English is the pervasiveness of specialized terminology, and those terms are usually clear and ambiguity-free (Alley, 2018, p. 15; Day & Gastel, 2012, p. 3). Moreover, scientific texts are written in a formal tone and slang language is avoided (Smith et al., 2009, p. 144). In addition, scientific writings are usually written in an impersonal and objective style, and usually the pronoun "I" is avoided (Bolton, 2018, p. 34). These tones are essential for maintaining scientific integrity and credibility.

Scientific texts occasionally feature title sentences that are incomplete and/or short. For instance, titles like "*Measurement of the speed of the expansion of the Universe*" or "*Discovery of a new gene linked to Alzheimer's disease*" are frequently observed. According to Carraway (2006, pp. 282-284), two reasons account for this practice. Firstly, such titles tend to sound more attention-grabbing, similar to how newspaper headlines are often constructed. Secondly, the aim is to limit the number of characters used. Many journals impose strict constraints on title length, prompting authors to condense their statements accordingly.

Generally, quotation marks serve to indicate the direct use of a phrase or sentence from another source without modification. When incorporating direct quotes from the written work of another author, it is essential to provide a reference to that particular source. There are no set rules regarding the quantity or length of direct quotes. However, it is worth noting that direct quotes are relatively uncommon in scientific manuscripts, and scientific writings rarely include direct quotations, this is

because quotations detract from the point scientists want to communicate and they do not reflect original thinking (University of Washington, 2014, p. 1). Generally, scientists typically prefer to convey the findings of others using their own words and provide a reference to the original paper. This is often achieved through sentences such as "*Smith and Jones (Smith and Jones, 20xx) reported the conversion of A into B*" or "*Li and Yu presented evidence of X being derived from Y (Li and Yu, 19xx)*". Demonstrating the ability to express the work of others in one's own words is considered a mark of scientific maturity (Penrose and Katz, 2004, p. 75).

Nominalization is a prominent feature of scientific texts, wherein verbs or adjectives are transformed into nouns to present information objectively and formally. Pérez-Llantada and Ferguson (2011, p.135) argue that nominalization is an integral part of scientific writing, it started with Issac Newton and is still commonly used today (Milne, 2011, p. 160; Halliday, 2004, p. 66). This linguistic strategy enhances precision and clarity, allows for packing a range of complex phenomena and concepts, and expresses them in a single entity, and achieves concision (Halliday, 2004, p. 66; Montgomery, 2017, p. 70). Furthermore, nominalization can lead to generalization, which can be tested by experimentation, and this is the core aim of natural science (Milne, 2011, p. 158). For instance, instead of stating "*The scientist discovered a new species of insects in the rainforest*", one can say "*The discovery of a new insect species in the rainforest was made by the scientist*". Moreover, "*the government announced new benefits*" can be nominalized as "*the government's announcement of new benefits*."

Modal verbs play a significant role in scientific English texts to express various degrees of certainty, possibility, or necessity (Yamazaki, 2001, pp. 17-18). These verbs are essential in maintaining a cautious and objective tone. For example, a scientific text may use a modal verb to convey uncertainty: "*The results of the experiment could indicate a correlation between variables X and Y.*"

Scientific texts employ a combination of short and long sentences. Short sentences are used for succinct and straightforward statements, while long sentences are employed to present complex relationships, elaborate on methodologies, or explain intricate concepts (Hofmann, 2019, p. 47). A short sentence might be: "*The data show a significant trend.*" In contrast, a long sentence could be: "*Based on the findings, the researchers concluded that the interaction between variables A, B, and C had a statistically significant effect, providing further support for the hypothesis proposed at the beginning of the study*" (ibid).

Another aspect of scientific English is the use of passive and active voices. There is not a clear consensus on the usage of passive and active in academic writing. In countries where English is the first language, this dispute is settled in the favour of active voice; however, the adoption of active voice in places where English is used as a second or a foreign language seems to be lagging behind (Inzunza, 2020, p. 563). Bank (2017) argues that the use of passive voice is prevalent in publications in the realm of natural sciences. Moreover, Corray (1967) argues that the passive "helps the writer to maintain an air of scientific impersonality" (Corray 1967 cited in Banks, 2017). Additionally, Inzunza (2020, p. 564) suggests that the use of

passive voice increases objectivity and stresses what was done, while the use of active voice is perceived as colloquial and risks the focus on the actor, rather than the action. Whatever is one's stance, it cannot be denied that both passive and active sentences are integral parts of English scientific writings.

Scientific texts frequently use abbreviations and acronyms to improve readability and conciseness. Acronyms and abbreviations are increasingly prevalent in scientific writings (Lindsay, 2020, p. 83). Abbreviations such as pH, DNA, and MRI are common examples. However, it is essential to define abbreviations upon first use to ensure clarity for the readers. In some scientific disciplines (e.g., physics), specific style guides or conventions dictate the use of acronyms. Authors should be familiar with these guidelines to maintain consistency within their field. Additionally, it is essential to avoid acronyms that may have multiple meanings or can be confused with other terms to ensure clarity and precision in scientific communication.

III. METHODS OF CONDUCTING THE STUDY

A. Data Collection

The data for conducting this study has been derived from those KSBs which are currently available in the bookshops in the Kurdistan Region of Iraq and can be easily purchased by readers. This decision formed the selection criterion which focuses on the availability and to some extent the popularity of the KSBs. As it is not possible to include all the KSBs, the researchers decided to examine a sample of these books and accordingly, they randomly chose five KSBs (cf. Saldanha, G. and O'Brien, 2013). Further, due to the length of the books and the scope of this paper, the researchers only analyse one chapter or section from each book, considering that the selected chapter or section shed light on the conventions of the CK used throughout the books.

The first book is entitled "داروین و رچیللمکی مرؤف" (Eng.: Darwin and Human Origins) and written by Goran Ibrahim. This book was published in 2014 by Sardam Printing and Publishing House. In addition to the title page and table of contents, this book consists of the author's preface, two chapters, a conclusion and a bibliography. Each chapter has its title and contains several sections in which various topics are explained. Further, as the author mentioned in the preface of the book, footnotes are provided for those words and phrases which are expected to be ambiguous for the readers. One section, pages 33-52, has been selected for the analysis. Furthermore, several sources have been cited throughout the pages of this section and the references are provided in footnotes.

The second book is entitled "بنه‌ساکانی شیرپه‌نجه‌ی گه‌ده، ریخۆل‌ه‌یی" (Eng.: The Basics of Gastric, Thyroid, Breast and Prostate Cancer) and co-authored by two experts, namely Dr. Hassan Shatawy and Dr. Kamaran Ameen Awa. This book has been published in 2018 by Khazalnoos Center for Printing and Publishing. It has the title page, table of contents, authors' preface, and eleven chapters. Each chapter explains a specific type of cancer. Throughout the book, medical terms are provided in footnotes in English. Chapter One, pages 9-29, has been selected for the analysis. Although references are provided at the end of each chapter including the

selected chapter, the authors did not cite the sources they have mentioned.

The third book is entitled "نه‌خۆشی دهرۆنی: به‌شیت بانگیان مه‌که،" (Eng.: Mental Diseases: Do not Call them Crazy, Feel their Pain) and written by Dr. Jaefar Umar. This book has been published in 2019 by Training Academy. It has the title page, table of contents, author's preface and ten sections. Most of the sections are further divided into sub-sections in which topics related to mental health are explained. Footnotes and endnotes are not provided in this book; however, many medical terms are provided in English with their Kurdish translations. One section, page 26-48, has been selected for the analysis. In this section, the author did not cite any sources.

The fourth book is entitled "گه‌شتی کیمیاگه‌ر: گه‌شتیکی میژووبیه" (Eng.: The Travels of Alchemist: A Historical Travel into Alchemy and Chemistry) and written by an expert, Dr. Khalid Muhammad Umer. This book was published in 2018 by Khazalnoos Center for Printing and Publishing. It has a title page, table of contents, preface, ten chapters and conclusion. Each chapter consists of several sections which are dedicated to topics related to alchemy and/or chemistry. A lot of terms are provided in English throughout the chapters but footnotes or endnotes are not used for providing further explanations. Chapter One, pages 21-37, has been selected for the analysis. In this chapter, the author cited seven sources, each source only once. These seven sources are provided as footnotes.

The fifth book is entitled "سایکۆلۆجیا: نه‌خۆشیی دهرۆنی و ره‌فتاری" (Eng.: Psychology: Mental Diseases and Abnormal Behaviours) and edited by Dyari Sabir. This book has been published in 2021 by Rahand Press. It has a title page, table of contents, editor's preface, and thirteen chapters. Each chapter explains a topic in psychology and is written by an expert and only two chapters are translated from English into CK. Occasionally, footnotes are provided in CK and sometimes medical terms are provided in English. Chapter Eleven, pages 157-167, has been selected for the analysis. Two sources are provided as references at the end of this chapter and the author, Dr. Hemin Fatih, cited each source only once.

For ease of reference, the researchers use the labels Book One, Book Two, Book Three, Book Four, and Book Five for the abovementioned books respectively.

B. The Methodology

To conduct the data analysis, this study employed a methodological framework which is Lambert and van Gorp's (1985/2006: 37-47) four-step scheme for describing translations. Within the field of Translation Studies, this four-step scheme is very useful for comparing and analysing source texts and their translated target texts because of examining the author, text and reader in both source and target systems. This scheme is also beneficial for analysing non-translated or original texts and thus it is quite useful as a methodology for data analysis. Therefore, to answer the research questions precisely and fulfil its aim, this study only utilised this scheme for examining the KSBs. This decision is based on the fact that the corpus for conducting this study is purely made of KSBs.

Lambert and van Gorp's (1985/2006: 46-47) scheme is conducted through four steps. The first step is preliminary data which focuses on analysing the title page, metatexts and the

general strategy (partial or full translation). The second is macro-level analysis which examines the different parts of the text, narrative structure, and so forth. For ease of understanding, the findings of these two steps have been presented with a description of the data in the previous section. The third is micro-level analysis which involves word selection, grammatical patterns, modality, and so forth. This step is particularly beneficial as it enables the researchers to identify the characteristics of the CK used in composing KSBs. To conduct the analysis according to this step, the researchers analyse the KSBs by extracting and quantitatively counting all the linguistic choices that fulfil or reject the language conventions of scientific English (see Section 2). Further, if the linguistic choices highlight other language conventions that are specific to the CK, they will be also quantitatively counted and discussed. The fourth step is systemic context which helps researchers to compare the findings of the second and third step and allows them to describe norms and different forms of relations. Hence this final step is used for making generalizations about the language conventions of the KSBs.

IV. RESULTS AND DISCUSSION

The selected chapters and sections from the selected KSBs have been analysed and the instances that fulfil or reject the requirements of a particular characteristic have been counted for obtaining quantitative results. Accordingly, this study reached the following results.

In terms of the clarity and precision of the provided information, the results indicated that all the KSBs generally presented their contents clearly and precisely (see Fig. 1). For example, a sentence such as “ببگومان نه خوشبیه دهر و ونیبه کان زورن و ” [Eng.: Of course the mental disorders are many and each disorder has its symptoms and peculiarities] is the evidence of providing clear and precise information. Only Books One and Two contain some sentences that are ambiguous to varying degrees due to using uncommon words and expressions. The results of clarity and precision in the following figure highlight that the authors of the KSBs mainly focused on this characteristic when they constructed scientific messages. Hence clarity and precision can be considered as potential characteristics of scientific writing in the CK.

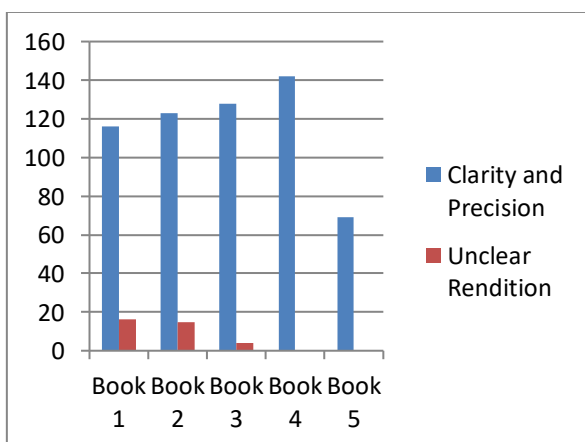


FIGURE 1: CLARITY AND PRECISION OF INFORMATION

The results of the style of language, in terms of using objective language or using subjective language and adding personal opinions, demonstrated that the authors of all the KSBs mainly employed objective language and restrained themselves from adding their own opinions (see Fig. 2). For example, the author of Book Four employed objective language in the following sample to express a fact: “نوسینی چینی بیویستی ” [Eng.: Chinese writing needs thousands of signs to express thousands of sounds]. The only exception in the results is Book One in which the author employed subjective language and added his opinions at certain times. The results of the following figure are significant findings concerning the validity of the content of the KSBs since this genre is expected to present factual and unbiased information through utilizing an objective language.

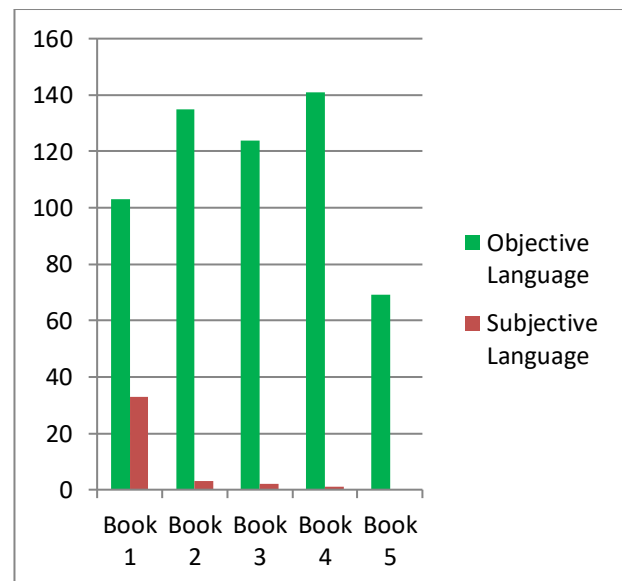


FIGURE 2: OBJECTIVE VERSUS SUBJECTIVE LANGUAGE

The authors of the KSBs also depended on utilising terminology to render precise information to the readers. This is apparent from the number of the terms that occurred in these KSBs (see Fig. 3). Using such terms, e.g. “خمۆکی” [Eng.: depression], not only creates scientific topics but also strengthens the cohesive ties among the sentences and paragraphs and ultimately makes the KSBs coherent. At the same time, the authors opted for nominalization frequently as this technique helps them in structuring sentences objectively and formally. For example, the author of Book Four preferred nominalization by using “دهر هینان” in “[...] له لایمن ” [Eng.: the extraction of iron [...] has been done by the Hittites] while it is possible to avoid nominalization. The occurrence of nominalisation across all the five KSBs provides a valuable finding that nominalisation might be a potential language convention in KSBs.

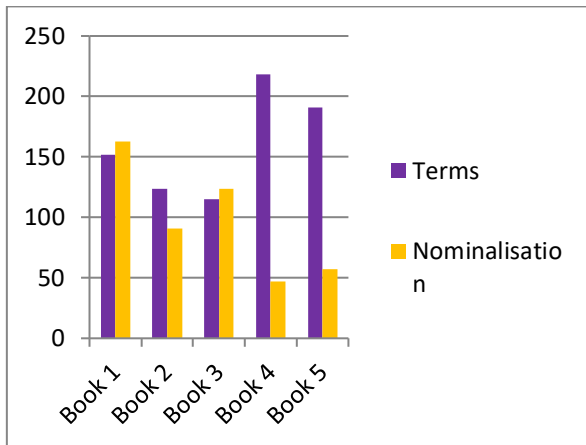


FIGURE 3: TERMS AND NOMINALISATION

Concerning the level of formality, the results demonstrated that all the KSBs are generally written in a formal language. The instances of using formal language are 121, 137, 140, 142, and 69 for Books One to Five respectively. For example, “رەنگ لە سەرچاوەی رووەکی و نازەلییەوه وەردهگیرا” [Eng.: colour had been taken from plant and animal sources], which is a sentence in Book Four, is an instance of using a formal language. In contrast, the authors rarely used informal words or expressions. The level of formality in the KSBs highlights that their authors paid great attention to structuring the messages they want to convey and that the messages are important and authoritative (Bell, 1991: 186). At the same time, the authors sometimes used modal verbs to convey possibility, necessity, and certainty. For instance, “دەکرێت” [Eng.: can], “دەبێت” [Eng.: has/have to], etc. are used. However, the results of model verbs are not many: 6, 20, 3, 5, and 11 for Book One to Five respectively.

In structuring the content, the authors opted for a mixture of long and short sentences. For example, “زنجیری زێر نزیكەى ٢٥٠٠ پ.ز لە شارى ئور دۆزراوتەوه” [Eng.: Gold chains had been found in the Ur city around 2500 BC] is a sample of a short sentence. But in all the five KSBs, the number of long sentences is more than the number of short sentences. This might be due to the writing conventions of the CK as it tolerates and prefers using long sentences. As the following figure displays, the authors have a preference for long sentences.

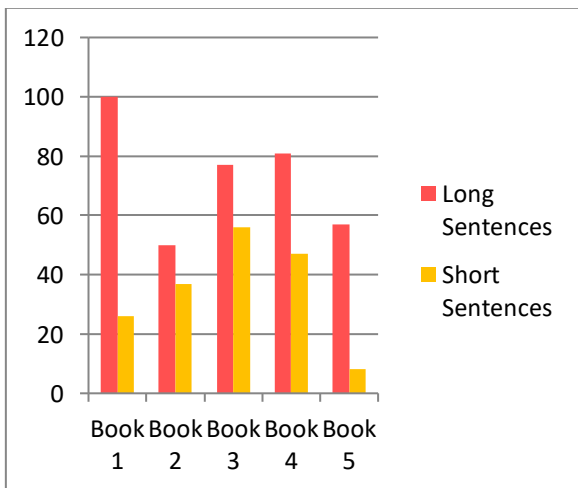


FIGURE 4: LONG VERSUS SHORT SENTENCES

Just like a preference for long sentences, the results show that the authors are in favour of using active sentences. Although all the KSBs contain active and passive sentences, the occurrences of active voice are higher compared to passive voice. For example, the author of Book Four constructed an active sentence in “میسرییه کۆنهکان نزیكەى ٣٠٠٠ سال پێش زابین ناسنیان” [Eng.: The ancient Egyptians used iron around 3000 years BC]. Generally, there is a preference for using active sentences over passive ones across all the text genres written in the CK. Text producers in the CK typically prefer to name the subject of a sentence unless there is a reason which makes them avoid mentioning it. Accordingly, the large number of active sentences in the KSBs is a clear manifestation of this preference.

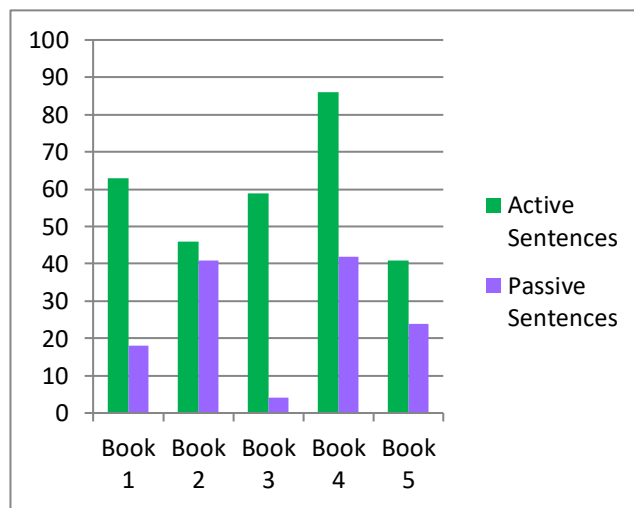


FIGURE 5: ACTIVE VERSUS PASSIVE SENTENCES

Whenever the authors of the KSBs mention the works of other scientific scholars, they generally tend to avoid using direct quotes. There are only 3 and 4 instances of direct quotes in Books Three and Four respectively. Another striking feature of these KSBs is that the authors provided sources at the end of the chapters but they occasionally cited them in the body of the chapters. Following these results, it can be said that there is no preference for using direct quotes in the KSBs.

In addition, the authors did not have any tendency to use Kurdish abbreviations and acronyms. The results of abbreviations and acronyms in the KSBs are compatible with the Kurdish writing conventions which generally do not allow an extensive use of abbreviations and acronyms. Compared to scientific texts, using abbreviations and acronyms are more common in political and institutional texts written in the CK. Similarly, the authors did not have any inclination to employ personal pronouns in constructing the contents of the KSBs. The results show a clear avoidance of using personal pronouns in the KSBs. One possible explanation for such avoidance might be due to the purpose for which these KSBs are intended. They might be mainly intended to provide information and then secondarily to guide the readers and thus personal pronouns are not used.

Another interesting result, which is similar to conventions in English, is the use of incomplete sentences in titles and figures across the five KSBs. For example, “رەنگ و بۆیهکردن” [Eng.:

colour and dyeing] is an incomplete sentence and used as the title of a section in Book Four. The instances of using incomplete sentences are very high compared to complete sentences. The results of incomplete sentences in titles and figures are 6, 37, 15, 12 and 4 for Book One to Five respectively. Although a precise reason cannot be given for such usage, it can be said that using incomplete sentences in titles and figures is a potential characteristic of the KSBs.

Borrowing words and terms from English is another potential language convention of the KSBs. The results of English loan words and terms are 61, 249, 35, 81 and 11 for Books One to Five respectively. For example, “spirometry”, “thoracotomy” and many other words and terms are borrowed. The authors frequently wrote these English words and terms in the alphabets of the CK and there are times in which they directly used the English words and terms without putting them in the alphabets of the CK. One of the reasons of resorting to English loan words and terms is the lexical gaps that exist in the CK. Depending on the results, using English loan words and terms is another potential characteristic of the KSBs. There are also instances in which the authors borrowed words and terms from Arabic. But the number of English loan words and terms is generally higher compared to the number of Arabic ones.

Further, Book One, Two, Three and Four contain uncommon Kurdish words: 63, 116, 18 and 7 respectively. For example, “قوربژنک” (Eng.: esophagus) which is an uncommon word is used frequently in Book Two even though the CK has “سورنچک” which is very common and has the same meaning. On the one hand, these instances cannot be ignored as they occurred more than once in these KSBs. It is an unexpected finding for which it is quite hard to give a precise explanation and it requires further research. On the other hand, these results cannot be counted as a potential characteristic of the KSBs since only Book One and Two contain large amounts of uncommon words and the rest of the books do not show such results.

While it is hard to indicate the extent to which the authors resorted to translation to construct the contents of the KSBs particularly because these KSBs are presented as being written rather than translated, there are still clear instances in which the authors translated content from English. This is evident as there are instances of calque translation as well as paraphrasing English terms. Another form of translation is those cases in which the authors translated contents from English, added them to the KSBs, and cited the English sources. It was this involvement of translation in constructing the KSBs which encouraged the researchers to conduct this study within the field of Translation Studies, particularly within scientific translation.

CONCLUSIONS

In this study, the researchers delved into the language conventions of five KSBs and examined their characteristics in the context of scientific translation between English and Kurdish. The analysis of the KSBs revealed several interesting findings. First, KSBs are characterized by clear and precise language, which aligns with the conventions of scientific writing. They predominantly utilize formal language, nominalization and scientific terminology to convey information effectively.

The authors of the KSBs tend to favour long sentences and employ an active voice, contributing to the objective and authoritative tone of these scientific texts. They also steer clear of direct quotations and personal pronouns, ensuring that their content remains factual and unbiased. Further, as it is the case with scientific English, incomplete sentences are used in titles and figures. However, in contrast to the conventions of English, the authors of the KSBs avoided Kurdish abbreviations and acronyms.

Another notable feature of the KSBs is the incorporation of English loanwords and terms, reflecting the influence of the English scientific language and the need to fill lexical gaps in Kurdish. This demonstrates the adaptability of KSBs to accommodate international scientific concepts. At the same time, the analysis also identified instances of uncommon Kurdish words, the extent and reasons for their use require further investigation.

Overall, this study highlights the potential parallels between KSBs and the language conventions of English scientific texts, showcasing their adaptability to international scientific discourse while preserving their unique Kurdish identity. One possible explanation of this similarity is that the authors of the KSBs probably employed scientific translation when they constructed the contents of their works. Although the KSBs did not indicate or reject the presence of scientific translation, the authors of these books in one way or another practised scientific translation, e.g. acquiring information from English sources and then representing (including translating) it in Central Kurdish. Understanding the language conventions of scientific Kurdish is crucial for enhancing scientific communication and translation efforts between English and Kurdish in the field of science.

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