Medical terminology in an audiovisual product

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Abstract
Audiovisual translation (AVT) from English into other languages is gaining popularity both in the entertainment and professional realms. Besides language difficulties, an interpreter has to face cultural challenges and a lack of professional knowledge of a particular subject field. This paper examines medical AVT from English to Kazakh. Translation issues in this field have rarely been the focus of linguistic studies, with hardly any studies of the matter with Kazakh as a target language. During the Covid-19 pandemic, it is crucial to be aware of cutting-edge technology and treatment techniques that are available in English. The TEDMED oral report "The Wireless Future of Medicine" made by Eric Topol, a distinguished cardiologist and geneticist, and its voice-over translation provided by the Kazakhstan national bureau of translations were chosen as the material for this pilot study. Continuous sampling was used to select 95 terms and term phrases (T-units) in the source text that were further distributed into eight subject field groups.
A standard classification was used to identify the translation technique in each case in the target text. As a result, frequency models were built for both subject groups and translation techniques. Groups related to medical procedures, medical devices, anatomy and physiology were the most frequent. There was a clear correlation between the subject field and dominant translation technique: equivalence prevailed in the fields connected with Kazakh medicine from nomadic times, while in other fields, there was an increase of techniques other than the equivalence.
Key words: medical terminological units, voice-over translation, metaphor, equivalent, Kazakh nomadic medicine

Introduction

Despite the fact that audiovisual translation (AVT) has become a very common type of translation practice in recent years, it is a challenging task for an interpreter to deal with psychological, linguistic and translation aspects in this mode of translation.
As defined by Chaume (2013), audiovisual translation is a type of translation in which audiovisual texts are transferred both interlingually and intralingually.
According to Zabalbeascoa (2008), audiovisual translation, unlike literary translation, is a translation act that involves sounds and images.
Regarding types of AVT, researchers distinguish more than 10 types of audiovisual translation. For instance, Munday (2008: 184-185) identifies seven types of AVT:
1. Interlingualsubtitling
2. Bilingualsubtitling
3. Intralingualsubtitiling
4. lip synchronization/ lip-sync
5. Voice-over
6. Surtitling
7. Audio description.

Chaume (2013: 105-123) defines two main macro-modes of audiovisual translation: *captioning* and *revoicing*.

Translation of speech in audiovisual materials (AVM) is specific as, apart from the text itself, translation problems are also caused by extra-linguistic factors that considerably affect understanding of what is said. Therefore, adapting a foreign language culture phenomena (values, concepts) represented in AVM speech is crucial for successful translation performance.

AVM translation is necessary for scientific and industrial organizations as well as medical and educational institutions. A large number of such materials presenting breakthroughs in medicine are provided in English, and their understanding is a challenge for Kazakh recipients. Healthcare workers, medical researchers and students are urged to make use of these materials to enlarge their scope of knowledge and be aware of the cutting-edge medical technologies that they can learn, develop further and apply to treat patients and save lives. This source of important medical information has become particularly important during the Covid-19 pandemic when hi-tech makes professional communication available through video calls and remote audiovisual translations for the non-English speaking participants. Audiovisual translation, including multilingual subtitling, makes it possible for healthcare professionals to exchange experiences, share new information and communicate with their colleagues around the world. The task of a translator/interpreter is to adequately adapt AVM according to the needs and level of the audience and not only to convey the idea but interpret the vital details presented in AVM. One of the major challenges that translators/interpreters face is definitely terminology itself and the variability of its use (which is extremely undesirable but still present) by participants from different countries depending on their medical traditions and traditional patterns of their medical language.

The expansion in the international distribution of films and television series, the proliferation of the translation done in the audiovisual field, and the introduction of the new technologies in the last two decades have all led us to be surrounded by screens, whether for entertainment or to obtain information and their crucial role in the dissemination of popular culture (O'Connell, 2007: 121). Kazakhstan is no exception to that. In Kazakhstani reality, AVT, for the majority of people, is related to fiction except for those who work as members of translation/interpreting agencies offering services in AVT and those several scholars and university departments of translation studies that train students in ATV. As Orero stated, "it remained in the realm of film or media studies, and it was only in the 1980s that it started to be studied from a translation perspective, within the discipline of Translation Studies" (Orero, 2009: 130). For Kazakhstan, the problem of AVT is particularly relevant as Kazakhstan is currently actively integrating into the global space. Therefore, the need for translating modern sources of information in various fields of politics, economics, industry and society is growing. The need became even more urgent after January 3, 2019, with the approval of new legislation – Article 9 "The language of a film release" of the law "On cinematography" of the Republic of Kazakhstan saying that "Foreign films released and shown in cinema houses and other places, intended for this purpose, in the territory of the Republic of Kazakhstan must be duplicated or subtitled or provided with a voice-over translation into the Kazakh language, except for the films of limited distribution" (Law of the Republic of Kazakhstan, 2019). Due to this recent legislative change, Kazakhstani cinematography, mass media and science have acquired an excellent opportunity to be enriched by new approaches, methods and techniques and data in the corresponding fields.

Voice-over translation, lip synchronization or lip-sync and surtitling are the most common and frequently requested forms of AVT in many countries around the world. There are many definitions of these types of AVT.

According to Luyken et al. (1991: 73), **interlingual dubbing (lip-sync dubbing)** is a form of AVT, which is "the replacement of the original speech by a voice track which

attempts to follow as closely as possible the timing, phrasing and lip-movements of the original dialogue".

Voice-over is the voice of an unseen narrator speaking (as in a motion picture or television commercial) (Merriam-Webster Dictionary).

Surtitling is subtitles which are projected above the stage or on the seatbacks at the opera or theatre (Munday, 2008: 85). Voice-over is a revoicing of both original and translated versions of a text at the same time. The content of subtitles must comply with ethical laws and regulations accepted in a country (this first of all concerns swearwords). To achieve this, interpreters resort to mild toning down (using "category shift" and "literal translation" strategies) but still do their best to adequately bridge the gap between the original text and its translation (see the example of English-into-Chinese translation of swearwords that appear in the episodes of The Family, an Australian reality TV series in Han, Wang (2012)).

In Kazakhstan, voice-over is currently the most frequently used type of AVT. It is widely applicable to documentaries, fiction and cartoons. The "Open University of Kazakhstan" is one of the web projects to improve the intellectual level of the population of Kazakhstan by providing free high-quality online courses and making online education available to everyone with the help of digital technologies. The tool's category, such as TED, offers Kazakh AVT of English TED Talks products in different spheres of science (architecture, music, education, medicine etc.). In the paper, the focus is made on the field of medicine for the reason of the stated above needs during the pandemic.

Translation issues in the medical field have rarely been the focus of linguistic studies so far. Hofer et al. (2015) argued that the major challenge for an interpreter is that they lack sufficient medical knowledge and stressed the need for a sound understanding of the specific medical situation, insisting that interpreters must be trained in domain-specific knowledge and terminology. This is a crucial observation for translating from English to Kazakh as far as most Kazakh interpreters are paraprofessionals. According to Ching (2017), who studied the techniques employed by Chin-Hakha <> English interpreters, their strategy often involved paraphrasing medical terminology or even lengthy description of a medical term meaning (being rather rendition than a translation) as a result of problems in equivalence between the languages. Anazawa et al. (2012) studied 5 types of interpretation errors, namely omission (the most frequent), false fluency, substitution, addition, and editorialization, with the focus on Japanese-into-English translation performed by 20 volunteer interpreters (including 25% of healthcare professionals among them) most of them having either translation experience and/or a year or more professional training. They pointed to the accuracy that is vital for medical translation. We join this viewpoint and consider that in the field of medicare, accuracy is no less important than technical translation.

Following the experience of Hassan (2017), who worked with Microsoft Terminology translation from English into Arabic, we agree with the guidelines he offered that focus on uniformity of technical terms transliteration. One of the techniques to provide accuracy can be back-translation, as tested by Baird & Skariah (2016) in translation from English into Dinka. Another way to achieve uniformity might be a bilingual corpus-based approach that allows for the analysis of a multitude of specific case-study samples and their translations, as shown in Darriba (2018) on the example of the Patient's Personal and Medical Information Form samples.

Linguistically, the success of translation for specific purposes clearly depends on the techniques that interpreters resort to. Each interpreter has to find an adequate proportion of the techniques they apply through training and experience. In this connection, studying translation samples can light on the optimal choice of

techniques and their proportion that can be language-specific. This study is a humble contribution to the matter of optimal technique choice while translating English oral medical texts into Kazakh that has not previously been the focus of researchers' attention. Following Hassan (2017), we hypothesize that in English–Kazakh translation of source language (SL) terminological units (terms – single words + term phrases – word combinations) into target language (TL) terminological units in the medical field, (i) the most frequent technique would be equivalence and the least frequent would be transliteration, (ii) equivalence would be much more characteristic for terminological units denoting anatomy, physiology, diseases and symptoms as far as the Kazakh have been involved treating patients since the times of their nomadic life and have been communicating professionally about the matter using their native tongue.

Methodology

This paper is not intended to provide a quality assessment of the VO of an AVT product. It is rather an attempt to analyze how English medical terminological units (further referred to as T-units) that appeared in the TEDMED text have been translated into Kazakh. The analysis of the translation techniques used by voice-over translation authors (members of NBT) is based on the classification of Komissarov (2001) that comprised equivalent translation, loan translation, loan-blending, generalization, specification, and transcription, transliteration, omission, addition. This classification, to a great extent, coincides with other existing classifications, although there is no uniform terminology even concerning whether they are techniques, strategies, processes etc. (see e.g. Bardaji, 2009; Zohre Owji, 2013; What are the main techniques of translation, 2021).

To test our hypothesis, a TED Talks-based oral text in medicine titled "The Wireless Future of Medicine" spoken by Eric Topol (2009 a) and its voice-over translation was chosen as the material for this pilot study. The VO (Topol, 2009 b) was produced by the non-profit National Bureau of Translations (NBT) of Kazakhstan within the project "New Humanitarian Knowledge. 100 New Textbooks in the Kazakh Language".

Continuous sampling was used to select medical T-units from both original English audio text and its Kazakh VO translation. Candidates for being a T-unit were suggested by the authors of this paper and further verified after a consultation with a medical expert working at Kazakhstan State Medical University. As a result, 95 unique medical T-units were identified. In the text, 136 occurrences of the T-units (unique T-units plus their repetitions) were realized. The total number of words realized in the text, including repetitions, amounted to 2833. The proportion of words involved in T-units occurrences (not including the accompanying initial functional words like particles, articles, prepositions and conjunctions) *vs* other words (not involved in building T-units) turned out 189 *vs* 2833 with the former accounting for over 6,7% of the text vocabulary. To obtain the proportion of the used translation techniques, all occurrences of T-units were included in calculations.

The identified T-units were classified according to 8 subject fields related to (i) medical devices, (ii) departments, institutions, organizations, (iii) participants of medical procedures, (iv) diseases and general pathological conditions, (v) pathogens, agents and particular symptoms of diseases, (vi) human anatomy, (vii) medical procedure, (viii) medical fields. In this classification, we applied the approach shared in (Grinev-Grinevich, 2008; Leychik, 2009; Shelov, 2018).

Results and discussion

T-units grouping and frequency of occurrence

Here we give the unique T-units distribution into the 8 groups. In each group, the T-units are presented alphabetically.

Group 1. T-units related to medical devices (instruments, equipment, and other technical devices) – 19 units:

AirStrip technologies ‘Эйэр Стрип технологиясы фирмасының өнімдері’, *(smart) Band Aid* ‘(ақылды) жабыстырғыш’, *bed* ‘төсек’, *bioconductant* ‘биожетекші’, *body area network* ‘денелік есептеу желісі’, *continuous glucose sensor* ‘қандағы қант мөлшерін үздіксіз өлшеп отыратын сенсор’, *digital medical wireless devices* ‘медициналық сымсыз жабдықтар’, *electrocardiogram* ‘электрокардиограмма’, *handheld ultra-sound* ‘шағын ультрадыбыстық жабдығы’, *Holter Monitor* ‘Холтер мониторы’, *hospital beds* ‘аурухана төсектері’, *hospital clinic resources* (translation of the word-combination is omitted), *iRhythm* ‘Ай ритм’, *iShoe* ‘Ай шу жеңіл аяқ киімі’, *ipatch* (translation of the T-unit is omitted), *pedometer* ‘педометр’, *stethoscope* ‘стетоскоп’, *ultra-sound device* ‘ультра дыбыстық жабдық’,wireless *accelerometer* ‘сымсыз акселерометр’.

Group 2. T-units related to departments (institutions, organisations) – 6 units: *hospital* ‘аурухана’, *intensive care unit* ‘қарқында терапия бөлімі’, *Medicare* ‘Медикер’, *medicine* ‘медицина’, *TEDMed* ‘осы конференция’, *Wireless Health Institute* ‘сымсыз медицина институты’.

Group 3. T-units related to specialists (and other participants) of the medicine – 6 units: *cardiologist* ‘кардиолог’, *caregiver* ‘күтуші’, *doctor* ‘доктор’, *expectant parent* ‘болашақ ата-ана’, *patient* ‘емделуші’, *physician(s)* ‘дәрігер(лер)’.

Group 4. T-units related to names of diseases and general (pathological) conditions of the human – 12 units: *Alzheimer's disease* ‘Альцгеймер ауруы’, *asthma* ‘демікпе’, *atrial fibrillation* ‘жыпылықтау бұзылысы’, *breast cancer* ‘кеуде қатерлі ісігі’, *chronic disease* ‘созылмалы ауру’, *chronic obstructive pulmonary disease* ‘созылмалы бітелген өкпе қабынуы’, *diabetes* ‘қант диабеті (сусамыр)’, *health* ‘денсаулық’, *heart failure* ‘жүрек жетімсіздігі’, *hyperglycemia* ‘глюкоза құрамының жоғарылығы’, *pregnancy* ‘жүктілік’, *Type II diabetes* ‘сусамырдың екі түрі’.

Group 5. T-units related to pathogens, agents and symptoms of diseases – 5 units: *broken hips* ‘сынған бөксе’, *hypertension* ‘жоғары қан қысымы’, *obesity* ‘артық салмақ’, *sleep disorders* ‘ұйқының бұзылуы’, *sudden cardiac death* ‘жүректің кенеттен тоқтап қалуы’.

Group 6. T-units related to human anatomy and physiology – 17 units: *blood pressure* ‘қан қысымы’, *cardiac echo* ‘жүрек қағысы’, *cardiac rhythm* ‘ЭКГ’, *deep sleep* ‘қатты ұйқы (қалың ұйқы)’, *fetal* ‘эмбрион’, *fetal heart rate* ‘шарананың жүрек қағысы’, *heart rhythm* ‘жүрек қағысы’, i*ntrauterine contractions* ‘жатырішілік жиырылулар’, *light sleep* ‘сергек ұйықтау фазасы’, *rapid eye movement* ‘көздің жылдам қозғалу фазасы’, *REM sleep* ‘тез ұйықтау фазасы’, *respiration* ‘тыныс алу’, *restorative sleep* ‘күш қайратты қалпына келтіру’, *sleep* ‘ұйқы’, *temperature* ‘температура’, *vital signs* ‘тіршілік әрекетінің көрсеткіштері’, *wrist* ‘білек’.

Group 7. T-units related to medical procedures – 22 units: *abdominal ultrasound* ‘құрсақ қуысының ультрадыбысы’, *blood glucose*, ‘қандағы қант құрамы', *calculate BMI* ‘дене салмағын байқау’, *clinical trials* ‘клиникалық тәжірибелер’, *count calorie* ‘құнарлылықты тексеру’, *delivery* ‘босану’, *drug therapy* ‘дәрі қабылдау’, *ECG* ‘ЭКГ’, *EEG* ‘ЭЭГ’, *headband* ‘байлауыш’, *hospital admissions and readmissions* ‘ауруханаға бірінші рет және қайта түсу’, *hospitalization* ‘ауруханаға жату’, *hospital stay* ‘ауруханаға жату’, *implanted* ‘имплантациялау’, *keep glucose between...* ‘қант деңгейін ... аралықта белгілеу’, *listen to the valve sounds and breast sounds* ‘дауыс және тыныс алу қарқынын тыңдау’, *physiologic metrics* ‘физиологиялық көрсеткіштер’, *pollen count* ‘шаңның құрамы’, *reduce heart failure readmissions* ‘жүрек жетімсіздігін азайту’, *take measurements of caloric intake* ‘құнарлылықтың кірісі мен шығысын өлшеу’, *test* ‘тест’, *under the skin* ‘тері астына’.

Group 8. T-units related to medical fields – 8 units: *genomics* ‘геномика’, *healthcare* ‘денсаулық сақтау’, *individualized medicine* ‘дербес медицина’, *mHealth* ‘сымсыз денсаулық сақтау’, *physiology* ‘физиология’, *exercise physiology* ‘адам физиологиясы’, *wireless medicine* ‘сымсыз медицина’, *wireless health* ‘сымсыз медицина’.

As we can see from the above distribution, the most frequent were Groups 7, 1, and 6, with a number of units varying between 22 and 17. Group 4 and Group 8 were less frequent, with 12 and 8 units correspondingly. The other groups (2, 3, and 5) were much less frequent, comprising only 5–6 units (see fig. 1).

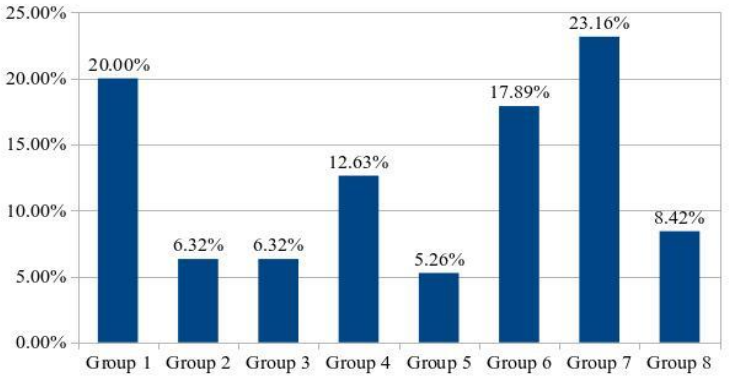

Figure 1: Group frequency based on the number of T-units included in each group

As for particular T-unit occurrences, out of 165 occurrences of the 95 units, the most frequent ones were the following: a general T-unit "disease" together with specific T-units denoting kinds of disease (Rank 1, 18 occurrences), a general T-unit "sleep" together with specific T-units denoting kinds of sleep (Rank 2, 17 occurrences), a general T-unit "medicine" (Rank 3, 8 occurrences), specific T-units "heart failure", "diabetes" and "health" were ranked 4 (7 occurrences each). There was 1 T-unit with 6 occurrences, 1 with 5 occurrences, and 1 with 4 occurrences (both general and specific). There were also 4 specific T-units that occurred 3 times and 10 general and specific T-units that occurred 2 times. Other T-units, both general and specific, were single occurrences. 5 T-units had the adjective *wireless* as a component, and 3 T-units had either *i-* or *m-* (=mobile) prefix.

Translation techniques

Based on the comparison with the text translation into Kazakh, translation techniques were identified for each T-unit. The comparison showed that the techniques were somewhat dependent on the group that the unit belonged to. Thus, for Group 5, which comprised names for pathogens, agents and symptoms of diseases and Group 6, which included the units related to human anatomy and physiology, equivalent translation was the most frequent. In Group 5, the equivalent technique was used in 47%, loan translation was a lower 35%, and generalization, transliteration, and specification were used in 6% each. Group 6 (the third largest group) was particularly remarkable as the equivalent technique reached 82,4% in it. Actually, 3 out of 17 T-units contain quite old loan words from Russian (also borrowed in there!) that have been completely adapted into Kazakh and are not perceived as foreign: *cardiac rhythm* ‘ЭКГ’, *fetal* ‘эмбрион’, *temperature* ‘температура’. Therefore, we might say that equivalence reaches 100% for Group 6.

It should be noted that the established equivalents of most of the anatomical T-units and those of physiology, as well as many names of diseases and symptoms, already existed in Kazakh. Kazakh native speakers from the time of nomadic life know the anatomical structures and functions of animals. A healer called a сынықшы '*bone-setter'* could fix a dislocated bone in the upper and lower extremities. They were aware of the methods of treating illnesses with surgical manipulations with the help of ordinary self-made instruments such as қандауыр (some kind of *scalpel*), hypnosis and medical preparations of animal, plant, and mineral origins. So, now, native Kazakh words related to nomadic medicine compete with the official medical T-units of Latin and Greek origin, denoting the same issues. As we can see from the Groups analysis, there is a considerable number of them, and they are eagerly used by medical specialists as well as ordinary people. Therefore, the interpreter of the AVM was expected to match them easily. 47-100% equivalent translation of the SL T-units into TL for Groups 5-6 prove our hypothesis.

Group 1, comprising T-units for modern medical devices, unlike Groups 5-6, had no connections with Kazakh nomadic medicine and therefore demonstrated a different technique distribution pattern. The most frequently used translation techniques were transcription (21%) and loan-blends (21%). Loan translation, transliteration, and equivalent translation amounted to 16% each. The remaining 10% is attributed to omission.

Regarding the T-units of Group 2 related to the departments (institutions), equivalence and loan blending occurred in 34% each, while generalization and transliteration shared 16% each. As in the above-mentioned Group 6, two T-units were borrowings from Russia that are not perceived as foreign anymore.

According to Crezee *et al*. (2021), healthcare interpreters must possess not just a strong command of ordinary language and idioms but also a thorough understanding of terminology. Therefore, healthcare interpreters should be aware of the T-units of different countries' healthcare settings and programs. Thus, the T-unit "Medicare" appears to be culturally specific, as there is no such a medical institution in Kazakhstan's medical system, and it is unfamiliar to ordinary people.

Such cultural T-units translation requires an interpreter to find the most appropriate translation technique and decide whether they should be foreignized or domesticated in the TL. We believe that both transliteration and the descriptive translation should be used in such cases.

In Group 3 (specialists and other participants in medicine), 16% of the T-units were transliterated, another 16% were introduced into TL by transcription, and a remarkable 68% percent were translated using the existing equivalents.

In Group 4 (names for diseases and general (pathological) conditions of the human), the equivalent was the most widely used technique (67%), followed by loan translation (25%) and loan blending (8%). There was a certain controversy concerning the translation of 3 units from this group. The first was *diabetes* translated into Kazakh in 2 different ways: by a loan-blend or hybrid form (*қант диабеті)* and its and by an equivalent *сусамыр*. We find that it is an undesirable situation for the perceiving audience when one and the same T-unit is given variable translation as it, first, contradicts the nature of a T-unit (unambiguity and invariance) and, second, prevents the audience from a clear understanding of the information in AVT.

Another example of undesirable T-unit synonymy was *atrial fibrillation* translated by the interpreter as 'жыпылықтау бұзылысы'. It doesn't match any of the three translations from the existing 2 dictionaries: 1) *жүрекше фибрилляциясы (жыбырлауы), жыбырлағыш аритмия* (Momynov *et al.*, 2003: 229), 2) *жүрекше жыпылықтауы* (Akhmetov, 2009: 436).

On top of T-unit synonymy cases found in the text, *heart failure* has 3 synonymic translations found in 2 dictionaries: Momynov et al. (2003: 222) as *жүрек кемістігі*

and Akhmetov (2009: 481) as *жүрек кемістігі* (the same as in Momynov) but also as *жүрек функциясының жеткіліксіздігі* and *жүректің функциялық жеткіліксіздігі*. It should be noted here that both dictionary compilers are medical doctors. Moreover, according to the Termincom.kz platform data, there is an officially approved translation of the T-unit as *жүрек қызметінің жетіспеушілігі* (termincom.kz a) that does not match the previous three. This situation must have resulted from 4 different names that exist in Kazakh for the word *failure*: *жетіспеушілік, жетімсіздік, тапшылық, жеткіліксіздік*.

The interpreter used one of the dictionary variants 'жүрек жетімсіздігі' (with the middle component omitted), although he was obliged to use the officially approved one – the one from Termincom.

Termincom.kz is a terminology standardization and management web-based, bilingual (Kazakh and Russian and vice versa) platform. It includes a system of unified T-units in science, education, technology, economics, and social life. The tool is free and available to its users. The project was designed by Shaisultan Shayakhmetov National Scientific and Practical Center under the authority of the Language Policy Committee of the Ministry of Education and Science of the Republic of Kazakhstan. Owing to the project members' activities, the Kazakh industry-specific terminology reached a new standardization level. For instance, according to the Termincom.kz statistics, more than 20 000 Kazakh translation variants of the T-units and words of the various fields were approved and posted under the heading "Terms and names (words) approved by the State Terminology Commission from 1971 to 2020" on its web site (termincom.kz b). Since the approval, the translation variant has become a must for interpreters in Kazakh.

Finally, in Group 4, a compound *Type II diabetes* was misunderstood by the interpreter even in a wider context. As a result, an erroneous translation as сусамырдың екі түрі 'two types of diabetes' was given. There might be 2 reasons for such an outcome: first, the lack of medical knowledge (quite probable as far as not many might be aware of Type I and Type II diabetes), and second, differences concerning word combinations with a noun attribute in English vs Kazakh. Although in Kazakh, a noun in the Nominative Case can function as an attribute to the following noun, a noun in Genitive Case with *-ның* flexion as a postpositional attribute is much more frequent.

In Group 7 (the largest group of T-units), equivalence was used in 56%. Transliteration was applied in 18%, loan blending and loan translation shared 13% each.

In Group 8, loan blending accounts for 50%, while transliteration and equivalence account for 25% each.

To finish the part on translation techniques, some words must be said about a metaphoric word combination "black swan of medicine," for which the interpreter used word-for-word translation. The 'Black Swan' concept introduced by Nassim Taleb in his 2007 book of the same name is an event that initially seems rare and difficult to predict, but in retrospect, often makes sense based on the situation (Bush, 2015). One of the articles devoted to the relationship of the *black swan* with the medicine is of B. A. Kotsias (2018). The author presented a few examples taken from different areas to justify the use of the metaphor: an irrevocable situation resulted from the outbreak of Ebola virus disease in West Africa with 6000 people dead in 2014 and other black swan phenomena published in different editorials (p. 301-302). Regarding our research, the medical usage of the metaphor in the speech of Eric Topol is related to the information on forthcoming high technologies in medicine.

Figure 2 summarizes the translation techniques distribution in the TL text.

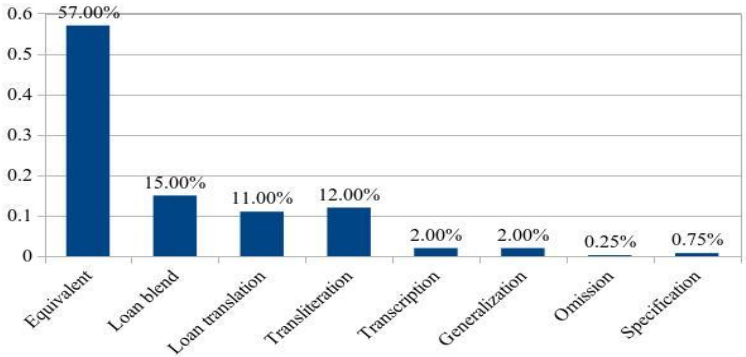

Figure 2: Translation techniques distribution in the TL text

Phonetic challenges and solutions

Provided interpreters are trained in phonemically correct pronunciation and auditory skills, one of the things that might still remain a problem for VO translation is being trained in allophonic patterns and reduced forms of words, including the juncture phenomenon. As far, there have been no studies concerning the effect of such English connected speech phenomena as taps, glottalization and glottaling, vowel quality reduction and omissions (these can be considered common for all native Englishes despite varying details) depending on interpreters' proficiency in language skills and interpretation, and we will consider them to be a challenge at least for the beginners. It would be naive to think that T-units avoid these natural speech modifications. Therefore, we decided to view the T-units in our text for these phonetic phenomena.

Acoustic analysis was performed in Praat (Broersma, Weenink, 2015) where dynamic spectrograms of the T-units were studied. The analysis showed the abundance of non-canonical allophones and omissions creating weak forms even among T-unit units, not taking into account other text segments. Just in T-units and their repetitions 35 taps, 33 glottalization and glottalling cases and 12 omissions occurred. All this creates a phonetically aggressive environment for inexperienced interpreters contributing to the total amount of challenges that they face while performing translation of an oral speech sample.

The acoustic analysis results give certain implications for professional interpreters' training. We argue that interpreters from English to other languages should be specifically trained to perceive natural speech modifications to facilitate better and quicker translation. A simple exercise of gap-filling might be used to, first, test the skill to recognize the tokens containing the phenomena and, if repeatedly exercising, to train the skill further. Then, specific exercises should be designed for practicing production and perception of modifications found in but not limited to American and British English (see e.g. Foulkes, & Docherty, 2007, Herdet al., 2010, Androsova, 2015, Androsova & Karavaeva, 2015 and many others): (i) taps, (ii) glottalization and glottaling, (iii) omissions:

Exercise 1. Listen to parts of the video and fill in the gaps:

1. Does anybody know when the _____ was invented? (stethoscope)

2. In the future, you're going to be checking all your _____ signs: your heart rhythm, your blood pressure, your oxygen, your temperature, etc. (vital)

3. That looks like this. It's like a wireless _____ , pedometer. (accelerometer) etc

Exercise 2. Listen to the words and word groupings, practice taps for the bold-type-underlined segments:

Digi**t**al me**d**ical wireless devices, vi**t**al signs, car**d**iac echo, diabe**t**es …

Exercise 3. Listen to the words and word groupings, practice glottalization and glottalling for the bold-type-underlined segments:

Hear**t** rhythm, body area ne**t**wor**k**, expectan**t** parent, hear**t** ra**te** …

Exercise 4. Listen to the words and word groupings, practice omissions for the bold-type-underlined segments:

Breas**t** cancer, han**d**held ultra-soun**d**, implan**t**ed, coun**t** calorie …

Conclusion

This paper aimed to study techniques of medical terms and term phrases voice over of an audiovisual sample from English into Kazakh. The necessity for the study was determined by an urgent need for cutting-edge medical technologies and treatment techniques during the Covid-19 pandemic and was supported by the availability of such materials in English. In the course of our pilot study, 95 terms and term phrases were selected from the TEDMED oral report "The Wireless Future of Medicine," presented by a distinguished cardiologist and geneticist. The translation techniques were identified for each of the 95 units in the voice-over translation provided by Kazakhstan's national bureau of translations. Data processing enables us to sort them out into 8 subject field groups: Group 1 comprising terms and term phrases for medical devices, Group 2 – for departments, Group 3 – for specialists in medicine, Group 4 – for diseases and general (pathological) conditions of the human, Group 5 – for pathogens, agents, and symptoms, Group 6 – for anatomy and physiology, Group 7 – for medical devices, and Group 8 – for medical fields. Among them, Groups 7, 1 and 6 turned out to be the most frequent. A clear correlation was found between the subject field and the dominant translation technique: equivalence prevailed in the fields connected with traditional Kazakh medicine from nomadic times, while in other fields, there was an increase in techniques other than the equivalence. This was best illustrated by the opposition of Group 6 (the closest connections with traditional Kazakh medicine) and Group 1 (no connections with traditional Kazakh medicine) which included approximately the same number of terms and term phrases but absolutely different patterns of translation technique distribution, with more than 82% of equivalent translation for Group 6 and only 16% of equivalent translation for Group 1. The results demonstrate that, along with vocabulary and grammar difficulties, the interpreter faced cultural challenges, a lack of professional knowledge of a particular medical field, and a lag in terminology standardization. A phonetically aggressive environment manifested by an abundance of connected speech processes such as taps, glottalization, and glottalling, as well as omissions, could have been an impediment. However, on the whole, the interpreter managed the highest percentage of listener-friendly equivalent translation (57%) and was able to limit listener-surly transcription, generalization, and omission to a maximum of 2%. As for loan blends, loan translation and transliteration varying between 15-11%, some of the variants might have been reconsidered, while others might be meant to occupy or have already occupied the high-tech medical vocabulary niche in the Kazakh language. The limitations of this study are connected to a small amount of the material. Therefore,

the outlook for further study is seen in analyzing more audiovisual medical reports and, probably, medical TV programs and their translations to complete and verify the suggested translation techniques distribution model and to build a more efficient strategy for training professional interpreters in this field.

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