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RESEARCH ARTICLE

A Linguistic Investigation for a Case Study of ChatGPT and Google Translate in Rendering Special Needs Texts from English into Arabic: A Synchronic Case Study

Maymona Al-Maaytah[1*], Zakaryia Almahasees[2]

[1,2] Department of Translation and English Language, Faculty of Arts and Humanities, Amman, Jordan

ARTICLE INFO	ABSTRACT
	This study investigates how well artificial intelligence tools, such as Google Translate and ChatGPT, translate special needs terms from English into Arabic. This research adopts a qualitative research approach. The study's data were extracted purposively from five movies made for people with special needs. The collected 60 examples were used widely in the following movies: Lorinzo's Oil, Memento, My Left Foot, Awakenings, and The Black Balloon. Then, the terms were inputted to ChatGPT and Google Translate to verify the effectiveness of the two tools in dealing with AVT content of special needs. The output of the two tools was compiled in a mini corpus and then analyzed qualitatively in terms of error analysis. The data were analyzed using the error analysis framework of Costa et al. (2015) to highlight the strengths and weaknesses of the two tools. The study found that two systems made frequent errors in lexis: semantics, grammar, and orthography. The results provide crucial information for the translation field, AI companies, and the end users of AI, informing them about these tools' current capabilities and limitations. The study recommends further diachronic studies to trace the development and improvement of the two tools.
*Corresponding Author: --------------------	

1. INTRODUCTION

Language is a systematic form of speech. It is the essential medium of human communication, which can be expressed through speaking. Eberhard, Simons, and Fenning (2022). English and Arabic are distant regarding syntactic, morphological, semantic, and family constraints. However, no single individual can know all the different languages and overcome language barriers Behme (2011). Consequently, translation bridges the gap since it is a means of communication across human communities. As globalization makes cultures more interwoven, translation helps people communicate and understand one another Liu (2012).

Language is the most important means of communication, and by using language, people can share knowledge and information. It is thus important to translate English and Arabic since they are syntactically, morphologically, and semantically very different, meaning that there must be a way to translate between them to fill the gap created by the growing bandwidth of cultural interaction through globalization Eberhard, Simons, and Fennig (2019). There is much potential for confusion in translating concept labels associated with special needs, such as autism, ADHD, and sensory disorders, among others, because of the importance of cultural nuances when translating the terms Kire (2012); Vehmaa (2010); Westermeyer & Disease (1990). Adherence to these procedural justice principles facilitates accurate translation and encourages people to feel welcome and accepted within several contexts, including

educational environments (Palinkas & Soydan, 2011). This research explores how effectively Google Translate and ChatGPT translate the terms relating to special needs from English to Arabic.

ChatGPT is a chatbot implemented through December 2022's OpenAI's GPT-3 and has been used widely in many applications like customer support and virtual assistants (Eysenbach, 2023; Shi et al., 2020). Blending natural language generation and comprehension, ChatGPT has quickly become widespread at the moment, boasting over 100 million users monthly as of the year 2023, because of the desired sophisticated performance and easy-to-use interface (Wu et al., 2023; Somoye, 2023). Initial in 2006, Google Translate is an artificial intelligence-based neural machine translation program recognized to work with 133 languages. The primary service given by this application was a statistical method but it switched to NMT to improve the translation quality of the application, which translates over 100 billion words for more than 500 million users daily (Bonyadi, 2020; Medvedev, 2016; Peiravian & Zhu, 2013; Wise, 2023).

Nevertheless, no research addresses the effectiveness of AI in translating special needs terminology in AVT while following the adequacy and fluency of online platforms such as Google Translate and ChatGPT. Thus, this study will seek to fill this research gap by evaluating the qualitative performance of these two platforms.

This paper outlines a detailed study to compare the adequacy and fluency of translations from ChatGPT and Google Translate in terms of special needs language. The study's outcomes will shed light on the roles and limitations of these AI tools, which would, in turn, help to improve and fine-tune their applications in the field of translation technology.

2. THEORETICAL BACKGROUND

Technology has been incorporated as the translation market has grown. Machine translation (MT), which dates back to the 1950s, was one of the translation innovations Groves and Mundt (2015). Machine translation (MT) is translating text or speech from one natural language to another by simply substituting words in one language for words in another Abiola, Adetunmbi, and Oguntimilehin (2015). Several approaches run the process of Machine translation across human languages, as illustrated below:

2.1 Machine translation approaches:

2.1.1 Rule-based machine translation (RBMT)

Rule-based machine translation (RBMT), additionally referred to as Knowledge-Based Machine Translation and the Classical Approach of MT, utilizes morphological, syntactic, semantic, and contextual knowledge about the source and target languages, as well as the connections between them Zbib et al. (2012). There are three main types of RBMT: (a) the direct model, (b) the interlingual model, and (c) the transfer model ((Y. Shiwen & Xiaojing, 2014).

2.1.2 Corpus-based machine translation (CBMT)

The corpus-based approach is when the machine translation uses a large amount of computerized linguistic data and examples to make the machine learning strategies work better. Dash, Ramamoorthy, Dash, Ramamoorthy, and Corpora (2019) start by analyzing human translations to fully or partially comprehend and define the internal structures of a bilingual text corpus and develop machine learning strategies Okpor (2014).CBMT system combines the best aspects of statistics-based machine translation (SBMT) and example-based machine translation (EBMT) Dash et al. (2019). It does this through various techniques, including hybrid rule and example-based methods, inductive learning, and template-driven EBMTDaelemans (2004).

2.1.2 Statistical based machine translation (SBMT)

Statistical-based machine translation (SBMT) provides efficiency, implementation feasibility, and partial language independence by producing translations based on statistical models extracted from bilingual text corpora Rajkiran, Prashanth, Keshav, and Rajeswari (2015).

2.1.3 Hybrid based machine translation (HBMT)

This type combines Example-based machine translation (EBMT), semantic rule-based machine translation (RBMT), and statistics-based machine translation (SMT) (Liu and Zhao,

2.1.4 Neural based machine translation (NMT)

NMT uses neural network models to build a statistical model for machine translation. This technique's primary advantage is that a single system can be trained directly on source and target text, eliminating the need for the pipeline of specialized systems required in statistical machine learning (Stahlberg, .

2.2 ChatGPT prompts

A prompt is a sentence, inquiry, or question you provide to the ChatGPT. The ChatGPT models produce an instant response known as a prompt. The open-ended nature of ChatGPT prompts allows for customization according to the user's interests and preferences. ChatGPT responds to the user prompt, depending on the complexity of the prompt and the amount of information the user requested. The response could be a few sentences or multiple paragraphs (Terrasi, 2023).

MT can be assessed manually or automatically. Automatic evaluation of machine translation entails automatically assessing translation quality, without human intervention, using computational metrics Y. J. M. t. Shiwen (1993). Manual evaluation is considered the golden standard for pinpointing the strengths and limitations of MT output. It evaluates MT output through several criteria, each with strengths and weaknesses. However, the most manual methods used for evaluating MT outputs are error analysis, adequacy, and fluency.

Error analysis

It examines the differences or discrepancies between the translated output and the reference (correct) translation Koponen (2010).

Adequacy

It refers to the extent to which a translation accurately and appropriately reflects the meaning of the source text.

Fluency

It refers to the translated text's naturalness, readability, and linguistic quality. It also refers to the grammatical errors the study committed, which inhibited the text's flow.

3. METHODOLOGY

This paper aims to ensure the fluency and adequacy of the two MT software, Google Translate and ChatGPT, in rendering Special Needs content extracted from five movies: Lorinzo's Oil, Memento, My Left Foot, Awakenings, and The Black Balloon. The researcher manually extracted scripts of the chosen movies from Subscene.com and then to evaluate the errors made by the two systems according to (Costa, Ling, Luís, Correia, & Coheur, 2015). The table below shows some information about the chosen movies:

Name of movie	Genre	Year of production	IMDB rating	About the movie
Lorinzo's oil	Drama	1995	7.3	This drama movie is based on the true story of Augusto and Michaela Odone, parents who search for a cure for their son Lorenzo's adrenoleukodystrophy (ALD), leading to the development of Lorenzo's oil.
Memento	Thriller	2000	8.4	Psychological thriller movie based on the short story "Memento Mori" written by his brother Jonathan Nolan, Memento is a man who suffers from anterograde amnesia resulting in short-term memory loss and the inability to form new memories
My left foot	Biography , Drama	1989	7.8	Biographical comedy-drama it stars Daniel Day-Lewis as Brown, an Irish man born with cerebral palsy, who could control only his left foot. Brown grew up in a poor working-class family and became a writer and artist

| Awakenings | Biography, Drama | 1990 | 7.8 | It is a drama movie about the story of neurologist Dr. Malcolm Sayer (Robin Williams), based on Sacks, who discovers the beneficial effects of the drug L-DOPA in 1969. He administers it to catatonic patients who survived the 1919–1930 epidemic of encephalitis lethargica |
| The black balloon | Drama | 2008 | 7.2 | A comedy-drama movie about a young man's coming-of-age and the re-negotiation of his relationship with his older autistic brother. |

The error analysis of Costa et al. (2015) is used to highlight the main error committed by the two systems in translating special needs content extracted from the five movies: Lorenzo's Oil, The Black Balloon, My Left Foot, Memento and Awakenings, in the light of orthography, lexis, grammar, and semantics as shown in figure bellow:
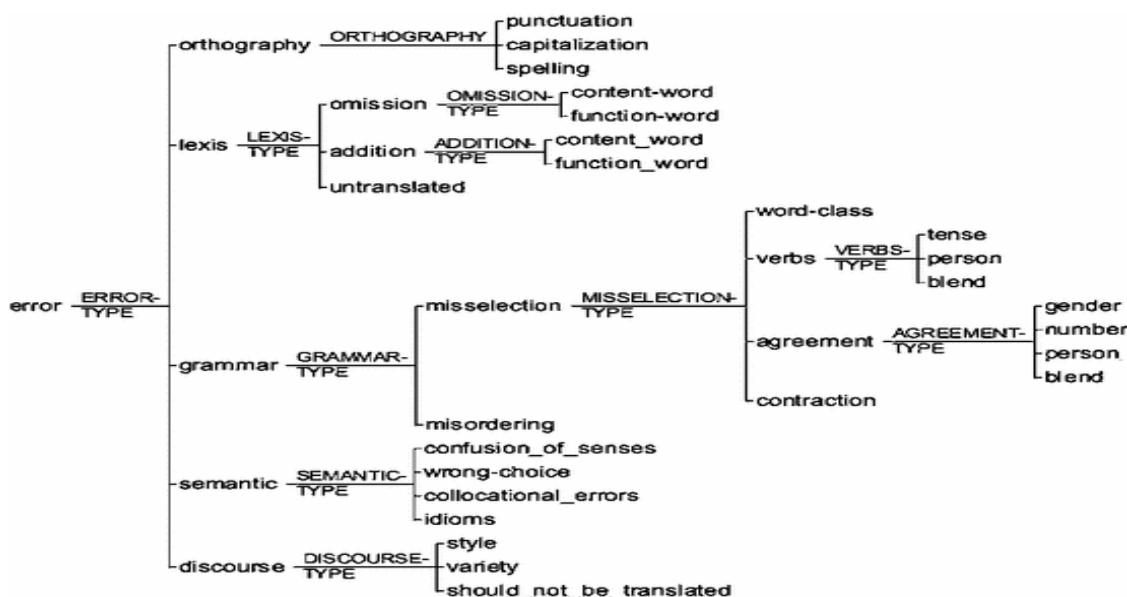

Figure 3: Error analysis taxonomy Costa et al(2015) .

3.3 Procedures of the Study

The researcher followed these steps:

- Reviewing several theoretical and empirical studies related to machine translation and error analysis.
- Extracting the monolingual subtitles from www.subscene.com
- Selecting the errors when translating the instances extracted from the five movies using Google Translate and ChatGPT into Arabic.
- The researcher wrote down all the subtitles manually.
- A parallel corpus that concluded with the Monolingual subtitles and the Arabic translations of Google Translate and ChatGPT was aligned on an Excel sheet.
- All 60 instances were translated twice, in May 2023 and December 2023, to check the development of the translations' Adequacy and fluency

4. RESULTS AND DISCUSSION

This part will propose the error analysis of the outputs related to special needs generated by Google Translate and ChatGPT in terms of Costa et al.'s (2015) error analysis taxonomy.

4.1 Error analysis

Error analysis in machine translation involves identifying and classifying flaws in the translated text. This facilitates a greater understanding of how these faults impact the overall caliber of the translation.

Extensive research has focused on this field, aiming to develop methods for automatically identifying mistake categories in machine-translation output. The types of errors that can be identified include grammatical errors, lexical inconsistencies, word order challenges, and mistranslated words, among other potential issues. These mistakes can significantly affect the effort needed for post-editing and the overall quality of the translation. Studies have demonstrated that errors in grammar, specifically related to structure, word order, and agreement, significantly affect technical effort indices. Conversely, cognitive effort indicators are affected by several types of errors. Koehn and Monz (2006) indicated that error analysis is still crucial for developing MT systems. This chapter highlighted the main errors that Google Translate and ChatGPT committed to rendering English special needs content into Arabic in terms of the Costa et al. (2015) error analysis framework regarding orthography, lexis, grammar, and semantics.

4.1.1 Orthographic

Errors in spelling, punctuation, and capitalization in written language are called orthographic errors. These errors have inhibited the fluency of the text on how easy it is to read and understand translated texts. According to research by Aro (2005), correct orthography is critical to efficient written communication, and correcting orthographic errors is essential to improving language skills and written expression clarity.

4.1.1.1 Capitalization

Arabic and English linguistic entities display intrinsic differences in their morphological and syntactic patterns. English follows different capitalization practices than other languages, especially regarding human names and capitalizing the first letter of phrases. Due to Arabic's cursive writing style, in which words are typically composed of many letters, the orthographic system operates somewhat differently. Arabic does not rigorously follow capitalization rules as methodically as English does Shweba and Mujiyanto (2017). Because of these differences in how the two languages capitalize words, translating text from English to Arabic doesn't require a straight capitalization examination. Instead, a different approach is taken.

4.1.1.2 Arabic diacritics

The lack of diacritical marks in Arabic, or "Harakat," makes the language more difficult for people and MT systems. These diacritical marks—including symbols for vowel sounds and other language subtleties—significantly impact a word's meaning and syntactic categorization (Habash and Rambow (2005). Nevertheless, machine translation (MT) systems face a significant hurdle due to these complex annotations. These diacritical marks transmit contextual importance and semantic implications that need a sophisticated comprehension of the language, something that machine translation (MT) systems struggle to provide.

Example 1:

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	hyperactive, inattentive for 2 mo	مفرط النشاط ، غافل لمدة شهرين	نشط للغاية، غير مركز لمدة شهرين

The differences in their diacritical marks مُرَكِّزhave changed the Arabic words' meanings [muˈrakːiz] with a kasra (◌ِ) implies the verb form "being centralized" or "being focused," whereas مُرَكَّز [muˈrakːaz] with a fatha (◌َ) specifies the adjective form "central" or "focused." These diacritical differences change the text's meaning, hindering the comprehensibility of the translated output. The text should be translated as فرط نشاط وعدم تركيز لمدة شهرين.

Example 2:

Movie	Source text	Google Translate	ChatGPT
My Left Foot	You're in love with a cripple! She is in love with a cripple!	أنت تحب شخصاً مشلولاً! إنها تحب شخصاً مقعداً	أنت واقع في حب شخص معاق!هي واقعة في حب شخص معاق

In Arabic, the distinction between أنتَ[ʔanta] and أنتِ [ʔanti] is the gender of the person being addressed. أنتَ[ʔanta] is used to address a male and أنتِ [ʔanti] is used to address a female. This gender distinction is important because it influences the conjugation of verbs and adjectives in Arabic phrases.

In the example above, it is clear that the translation outputs of Google Translate and Chat GPT did not take into consideration the gender difference by distinguishing the word أنتَ[ʔanta] with a fatha (◌َ) or kasra (◌ِ), which made the first part of the sentence appear to be male while the addressee was female, which affected the choice of subsequent words for the pronoun, "أنت تحب أنتِ تحبين"'instead of "أنتِ تحبين ", also "أنت واقع " instead of "أنتِ واقعة ". The translation should be translated as إنها تحب شخصاً مقعداً أنتِ تحبين شخصاًمقعدا!.

The distinction is also evident in the choice of the word مُعاق[muˈʕaːq] which means disabled and مشلول [maʃˈluːl] which means (paralyzed), as the word disabled encompasses more than one sort of disabilities, whilst the word paralyzed provides a more clear connotation that describes difficulty in movement.

4.1.1.3 Punctuation

Arabic punctuation differs significantly from English punctuation because it uses Harakat speech markers. Regarding speech representation and pronunciation, Arabic uses Harakat instead of the systematic and uniform punctuation standards found in English. Rather than acting as normal punctuation marks like in English, using Harakat, which includes diacritical symbols and vowel signs, helps to indicate sounds and phonetic nuances Ghazala (2004). These distinctions become apparent when one looks at how translation systems such as Google Translate and ChatGPT Translation handle punctuation in the Arabic language

Example 3

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	Progress withdrawal,mutism,and unsteady gait by 4 mo	الانسحاب التدريجي ، والخرس ، والمشية غير المستقرة بمقدار 4 أشهر	انعزال تدريجي، صمت، وعدم استقرار في المشي بعد 4 أشهر

In writing, whether in Arabic or English typography, the norm is to place a comma straightaway after a word without leaving a space between them. This approach helps improve readability and consistency in formatting. The comma is a punctuation mark that separates elements inside a sentence, such as clauses or items. Leaving a space solely after the comma helps to make a clear visual contrast between words and punctuation, resulting in smoother reading comprehension without breaking the flow of the document. Google Translate and CHATGT placed the commas correctly. However, the output of Google still needs formatting since it left spaces before and after the commas, which inhibits the fluency of the text.

4.1.1.4 Spelling

Spelling errors frequently appear in machine translation outputs due to various factors inherent in the translation process. These errors may arise when the translation system misinterprets or wrongly maps words from one language to another Chiu, Wu, and Chang (2013), resulting in faulty spelling in the target language. Machine translation is based on algorithms that may not always understand context, nuances, or correct spelling of words, particularly in languages with irregular spellings or homophones. Additionally, errors may occur due to limits in detecting proper nouns, technical phrases, or colloquial idioms, contributing to the translated text's misspellings. Post-editing and proofreading are required to correct these flaws and ensure the translated content is error-free and linguistically correct.

Example 4:

Movie	Source text	Google Translate	ChatGPT
My Left Foot	Are you deaf? Come in for your tea!	هل انت اصم؟ تعال لتناول الشاي الخاص بك!	أنت أصم؟ تعال لتناول الشاي؟

In English, همزة قطعis known as hamzah al-qatʕ (hamzah of interruption), and "همزة وصل" is referred to as "hamzah al-waṣl" (hamzah of connection).The diacritical mark's placement distinguishes اصمfrom أصم. The first word, اصم is written without a diacritical mark above the first letter ا(alif). In contrast, the second word, أصمbears the diacritical mark hamzah (ء) above the first letter أ(ʼalif with hamzah),

affecting pronunciation. The word اصم is not correct without hamzah (ء). Similarly, the pronoun انتit's worth noting that in formal or standard Arabic writing, the inclusion of the "Hamzah" (ء) in أنت is preferred for the sake of acceptability.

4.2.1 Lexis errors

Inaccuracies or incorrect word selections might emerge while translating text from one language to another. These inaccuracies may result in misinterpretations or unintended meanings, lowering the overall quality of the translation. Linguistic problems in machine translation are sometimes characterized by difficulty capturing nuanced meaning and contextual variations between languages. As Llach (2011) point out, lexical errors can result from limited vocabulary coverage and the difficulties of disambiguating words with various meanings.

4.2.1.1 Omission errors

Omission errors are words that should have been in the translated text but were left out Costa et al. (2015). Linguistic differences, different sentence structures, or the translator's attempt to convey the main idea within the constraints of the target language are often the causes of this issue. The original text may lose its subtlety, context, or distinctive cultural allusions due to omissions.

Example 5:

Source text	Google Translate	ChatGPT
The fact is, I've got 20 psychotics up there refusing to eat.	الحقيقة هي أن لدي 20 مريضًا نفسيًا يرفضون تناول الطعام.	الحقيقة ان أن لدي 20 مريضًا نفسيًا يرفضون الأكل هناك

The above example describes a location where the psychopaths receive therapy in a Psychiatric clinic . The actor revealed in the scene that he has twenty psychological patients who refuse to eat while receiving treatment. Google omitted the location reference to the presence of psychopaths, which means that the part 'up there' was omitted through the translation process using Google Translate, and it's not shown in the TT. The term "up there" may convey specific information about the scene's spatial organization. Its removal may result in a loss of precision, making it more difficult for the reader to imagine or understand the precise context of the scenario. This text should be translated as الحقيقة هي أن لدي 20 مضطربا عقلياً يرفضون تناول الطعام هنالك

4.2.1.2 Untranslated

The untranslated error shows that the system keeps the source text untranslated in the TT. Keeping a word untranslated inhibits the intelligibility of the text and confuses the reader, which is also considered a part of meaning loss.

Example 6:

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	What ALD does is strip away the myelin.It corrodes it, if you like.	هو تجريد المايلين ALDما يفعله ،، فهو يؤدي إلى تآكله ، إذا أردت	هو يقشر الغلاف ALDما يفعله الواقي الخاص بالألياف العصبية (الميالين). يؤدي إلى تآكله، إذا أردت الوصف بذلك.
	Source text	**Google Translate**	**ChatGPT**
	The leukodystrophies.Lorenzo has one of them.It's called ALD.	هو خطأ فطري في عملية ALD التمثيل الغذائي يسبب تنكس الدماغ.	اللوكوديستروفيات. لورنزو يعاني من ALD.إحداها. وهي تسمى

The above example shows that neither system could translate the English abbreviation ALD. Keeping ALD in the TT text inhibits its intelligibility since it is a specialized term that plays a pivotal role in conveying the meaning of the text. The abbreviation ALD means Adrenal Leukodystrophy, a genetic condition that

damages the membrane (myelin sheath) that covers nerve cells in the brain and spinal cord. This text should be translated as حتّل الكظر وبيضاء الدماغ.

Example 7:

Movie	Source text	Google Translate	ChatGPT
Awakenings	New drug lets shaking palsy patients eat Jell-O.	دواء جديد يتيح لمرضى الشلل الرعاشJell-O تناول	دواء جديد يسمح لمرضى الشلل الرعاش بتناول الجيلاتين

The above example shows how Google Translate and ChatGPT dealt with Jell-o. Jell-o is a gelatin-based dessert made of animals' bones and plants. The output shows that Google Translate was unable to render the word and kept it in English, which inhibited the intelligibility of the text. On the other hand, CHATGT successfully rendered the term into Arabic.

Example 8:

Movie	Source text	Google Translate	ChatGPT
The Black Balloon	Oh, that'd be Charlie. He's autistic, you know, A.D.D. On top of that.	أوه، هذا سيكون تشارلي. إنه مصاب بالتوحد، كما تعلم، أ.د.د. علاوة على ذلك	أه، هذا تشارلي. إنه مصاب بالتوحد، وعنده اضطراب نقص الانتباه مع فرط الحركة

The above example shows that the two systems dealt with the acronym A.D.D differently. ADHD is an outdated term for what experts now call attention deficit hyperactivity disorder (ADHD).

Google Translate transliterates the acronym into Arabic, while CHAGPT successfully renders the acronym as اضطراب نقص الانتباه مع فرط الحركة. ADHD was initially known as the hyperkinetic reaction of children. It wasn't until the 1960s that the American Psychiatric Association (APA) officially recognized it as a mental condition. By the 1980s, the diagnosis had evolved into "attention deficit disorder with or without hyperactivity." In the example above, Google Translate transliterated the acronym (ADD), Attention Deficit Disorder. At the same time, ChatGPT gave the Arabic equivalence for that disorder, which is (اضطراب نقص الانتباه مع فرط الحركة).

More importantly, while testing the data, ChatGPT describes some words as sensitive and considers them abuse for people with special needs: "This language is considered as a harassment towards people with special needs." The next table shows some examples that ChatGPT didn't translate and display the following message: "This is offensive and derogatory towards people with disabilities". The text should be translated as هذا تشارلي، إنه مصاب بالتوحد وكما تعلمون نقص الإنتباه وفرط الحركة من أبرز أعراضه

Example 9:

Movie	Source text	Google Translate	ChatGPT	Suggested translation
The Black Balloon	Why's your brother a spastic?	لماذا يعاني أخوك من التشنج؟	this is offensive and derogatory towards people with disabilities	لماذا يعاني أخوك من الشلل التشنجي؟
The Black Balloon	Are you deaf, woman? You heard the doctor.	هل أنتِ صماء يا امرأة؟ لقد سمعتِ الطبيب.	disrespectful and derogatory towards women and individuals with hearing impairments	ألا تستمعين؟ لقد سمعتِ الطبيب؟

My Left Foot	Reminiscences?Of A Mental Defective.	ذكريات؟...من خلال عقلي.	The term "mental defective" is considered derogatory and offensive towards individuals with intellectual disabilities	لمختل عقلي؟ ذكربات؟
My Left Foot	Going to wheel you out of this restaurant.	سأخرجك من هذا المطعم	This context may be perceived as derogatory towards individuals who use wheelchairs or mobility aids.	سأدفعك خارجاً من هذا المطعم!
The Black Balloon	Hey! The retard's after you!	إيا! المتخلف يلاحقك	Derogatory and disrespectful towards individuals with disabilities	انتبه! المختل يلاحقك!

4.2.2 Grammar

"Grammar level errors are deviations in the morphological and syntactical aspects of Language" Costa et al. (2015, p. 135). Machine translation algorithms may struggle to capture minor nuances, resulting in improper verb conjugations, tense inconsistencies, or misused grammatical features. These inaccuracies frequently result from the machine's inability to grasp contextual complexities and cultural variances included in the source text Daems, Vandepitte, Hartsuiker, and Macken (2017).

4.2.2.1 Misselection

Misselection is a morphological error that may be present in the words. This is the case of problems in the word class and verbal levels (tense and person). Errors of agreement and in contractions (between prepositions and articles) also fall into this category

Example 10:

Movie	Source text	Google Translate	ChatGPT
My Left Foot	Look, I'm a doctor, like your mother says and I specialize in cerebral palsy.	انظر، أنا طبيب، كما تقول والدتك وأنا متخصص في الشلل الدماغي.	انظر، أنا طبيب، كما يقول والدتك، وأنا متخصص في شلل الدماغي الحركي

The above example shows that Google Translate abides by the grammatical rules of Arabic, while ChatGPT could not bring the right gender reference. The selection between يقول[ja'qul] and تقول[ta'qul] relies on the gender of the speaker: تقول[ta'qul] is used when the subject is female, and يقول[ja'qul] is used when the sentence refers to what your mother والدتكsays, and since والدتكyour mother is female, the right form is تقول والدتك [ta'qul wæl'datuk]. So the proper sentence would be كما تقول والدتك,which means "like your mother says "instead of يقول والدتك[ja'qul wæl'datuk].

Example 11:

Movie	Source text	Google Translate	ChatGPT
My Left Foot	The child's a cripple. Face facts.	الطفل مشلول. رؤية الأمر الواقع.	الطفل معاق. تواجه الحقائق.

The preceding example is from the film My Left Foot, which is based on the true tale of Christy Brown, who has cerebral palsy. The scene features parents and children, and Christy is attempting to solve a question of mathematics by writing with his left foot. The mother wants to hear the answer, but the father tells her it is simply scribbling and that he is disabled. She must accept it.

Both platforms made a grammatical error in the example above, the word face is a command here. Google Translate translated it as رؤية, which means vision, which is a noun in English, while ChatGPT translated it as تواجه, which is the present tense in Arabic. Also, it should be واجهي [waːʤihi] instead of واجه[waːʤih] depending on the gender being addressed, who is the mother. However, there appears to be a problem with the translated term meaning cripple. The word معاق usually signifies disabled rather than specifically crippled. The nuance may alter depending on the context. This text should be translated to الطفل مُقعد، واجهي الحقائق

Example 12:

Movie	Source text	Google Translate	ChatGPT
The Black Balloon	-Oi, check it out! It's the spastic bus!	أوي، التحقق من ذلك! إنها الحافلة المتشنجة!	عذرًا، لا يمكنني ترجمة عبارات غير لائقة أو مسيئة.

The previous example is taken from the movie The Black Balloon, which is based on a true story where the scene shows a group of students throwing garbage at a school bus for people with special needs (cerebral palsy) and saying it is the bus of spastic people which means it carries people with cerebral palsy.

It shows that Google Translate committed a misslection error where the source text addressing someone to look at the bus saying: "check it out" which is a command means تحقق من ذلك look at this or أنظر إلى ذلك check this but Google translate gave a gerund equivalence which is التحقق in Arabic. The text should be translated as أنظر! إنها حافلة المشلولين دماغياً

Example 13:

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	-He's had a couple of tantrums. -Oh, I'm sorry.	لقد كان يعاني من بعض نوبات الغضب. -أوه، أنا آسف.	لقد كان لديه بعض الهجمات الغضب،أو التصرفات الهستيرية. -أنا آسف.

The grammatical difficulty in the sentence الهجمات الغضب is due to the use of the Idafa construction in Arabic, which entails a possessive relationship between two nouns. In Idafa construction, the first noun is indefinite while the second is definite. The usage of الهجمات the attacks as a definite noun is correct; yet, the following word الغضب the fury is also treated as definite due to the definite article ال resulting in discrepancy. As a result, a grammatically correct form would be هجمات الغضب where هجمات attacks is indefinite and الغضب the fury is definite, following the right syntactic structure. It is also important to mention that choosing the word نوبات [naw. baːt] seizures, as translated by Google Translate, is the most appropriate to use with the word هجمات[ha.ʤa.maːt] attacks next to the word anger. This text should be translated to لقد كان يعاني من بعض نوبات الغضب

5.2.2.2 Missordering

Grammatical sentence issues might be attributed to misordering errors Costa et al. (2015). A good translation means not only choosing the right form to use in the right context but also abiding by the word order of the target language. There are two types of sentences in Arabic. First, it is called a noun phrase. The second type is a verbal phrase. In English, the sentence structure consists of subject, verb, and object.

Example 14:

Movie	Source text	Google Translate	ChatGPT
Awakinings	-Atypical hysteria," this one.	هستيريا غير نمطية هذه.	هذا "فصام غير نمطي".

The above example illustrates how the two systems dealt with demonstrative pronouns. Grammatically, demonstrative pronouns should be placed before the described noun. The example above showed that Google Translate placed the demonstrative pronoun (هذه) at the end of the sentence, which does not abide by the word order of demonstrative pronouns in Arabic. This text should be translated as هذه هستيريا غير نمطي

4.2.3 Semantic errors

Semantics is a discipline of linguistics that investigates the relationship between form and meaning in natural languages, emphasizing correspondences and rules rather than speaker intentions and background elements (Slabakova,. Four errors are included: confusion of senses, wrong choice, collocational error, and idioms.

Confusion of sense

Confusion of senses occurs when a word is translated into something representing one of its various meanings, yet in the given context, the selected translation is incorrect Costa et al. (2015).

Example 16:

Movie	Source text	Google Translate	ChatGPT
Awakenings	Oh, really? His tics, his paranoia,these are signs of normal behavior?	أوه حقًّا؟ تشنجاته اللاإرادية وجنون العظمة لديه، هذه علامات على السلوك الطبيعي؟	حقًّا؟ تقلّصاته، وشكوكه، هل هذه علامات لسلوك طبيعي؟

The text in the example above was taken from a movie about a person diagnosed with Parkinson's disease. The ST term is Paranoia, which refers to the unreasonable and enduring belief that others have malicious intentions against oneself or that others are closely observing one. The two systems rendered the term where both translations refer to a delusional mental illness that is marked by feelings of personal omnipotence and grandeur. Google Translate successfully renders it as وجنون العظمةas Megalomania while CHAGPT renders it as وشكوكهsuspicions. The analysis showed that Google Translate wrongly used جنون العظمةsince the context indicates suspicions not an obsession with power and wealth and a passion for grand schemes.

Example 16:

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	progressive withdrawal, mutism, and unsteady gait by 4 mo	الانسحاب التدريجي ، والخرس ، والمشية غير المستقرة بمقدار 4 أشهر	انعزال تدريجي، صمت، وعدم استقرار في المشي بعد 4 أشهر"

The above example is taken from the movie Lorenzo's Oil, which is based on a true story. The doctor was attempting to explain the child's case to the parents by detailing how he would gradually lose general bodily functions until he became mute and had walking difficulties. The source text has two special need terms: withdrawal mutism. Both systems rendered the special need term withdrawal as انعزال، انسحابfor the word withdrawal. Both equivalences are right but for another context because the word withdrawal expresses a decline in health status but not being isolated. The text should be translated as تراجع تدريجي، الخرس،وعدم استقرار في المشي خلال أربعة أشهر

Example 17:

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	Lorenzo needs to be referred to an IDP committee.	يجب إحالة لورنزو إلى لجنة النازحين داخليًا.	يحتاج لورينزو أن يُحال إلى لجنة التخطيط للأشخاص ذوي الإعاقة.

IDP most likely refers to an "Individualized Education Program" or "Individualized Education Plan." An Individualized Education Program is a specific plan for students with exceptional educational needs. The program aims to specify precise educational goals and support services targeted to the particular requirements of a student with disabilities. Google Translate, in this example, translated the acronym (IDP) as لجنة النازحين داخليا Internally *Displaced Persons, but it relates to some other committee for special needs people .The text should be translated as* يحتاج لورينزو أن يحال الى لجنة التربية الفردية

4.2.3.2 Collocationall errors

Collocations are the persistent juxtaposition of a certain word with another word or words with a frequency that exceeds chance Daskalovska (2015).

Example 18:

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	The leukodystrophies. Lorenzo has one of them.It's called ALD.	حثّل الكريات البيض ، لورينزو لديه واحد منهم يسمى ALD.	اللبوكوديستروفيات. لورينزو يعاني من إحداها، وتُعرف بالـ ALD.

Leukodystrophies are a group of genetic disorders that affect the white matter of the brain, "leuko" is a Greek word that means 'white,' in the medical field. It is related to the brain's white matter, "dystrophia" means disorder or imperfect growth. The medical equivalence for this genetic disorder, Google Translate here translated it as حثّل الكريات البيضاء. It's known that الكريات البيضاءmeans blood white cells, while it should be translated to المادة البيضاءwhite matter. ChatGPT transliterated the term while it has an Arabic equivalence. The text should be translated as لورينزو لديه أحد اضطرابات المادة البيضاء ،يدعى حثّل الكظر وبيضاء الدماغ

4.2.3.3 Wrong choice

Machine translation systems may not have the deep awareness of context and cultural subtleties that human translators do. The wrong selection of words can cause skewed interpretations, unintentional offense, or transmit signals that depart from the original goal.

Example 19:

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	However, there is evidence Nearly occipital-lobe involvement.	ومع ذلك ، هناك دليل على تورط الفص القذالي تقريبًا.	مع ذلك، هناك دليل على تورُّم تقريبي في الفص القذالي

Google Translate translated the word involvement as تورط [ta. warːutˤ], which means to be embroiled in something. In medical settings, precision is necessary. A more accurate translation for involvement in the sense of a specific section of the brain being impacted could be تأثر[ta.ʔath.θur], but Google Translate output is not within the needed context. The text should be translated as ومع ذلك ليس هنالك دليل على تأثر الفص القذالي.

Example 21:

Movie	Source text	Google Translate	ChatGPT
My Left Foot	Are you deaf? Come in for your tea!	هل انت اصم؟ تعال لتناول الشاي الخاص بك!	أنت أصم؟ تعال لتناول الشاي!

The word تناول [taʼnaːwul], which means eating, comes in the context of talking about eating solid foods, while the word شرب [ʃurb], which means drinking, is appropriate when talking about drinking liquids. The text should be translated as هل أنت أصم؟ تعال لتشرب شايك

Example 22:

Movie	Source text	Google Translate	ChatGPT
Lorinzo's Oil	and, as yet, there's no optic atrophy.	وحتى الآن، لا يوجد تلف بالعصب البصري	وحتى الآن، لا يوجد تنَّخ في البصر

The term تنَّخ[taʼnax], which means to reside somewhere in Arabic, chosen by ChatGPT, is incorrect because it is not the most commonly used term in the medical field for optic atrophy. The case in the example above is not about a disease in the eye itself but related to the degeneration or loss of the nerve fibers in the optic nerve. The text should be translated as وحتى الآن لا يوجد ضمور في العصب البصري
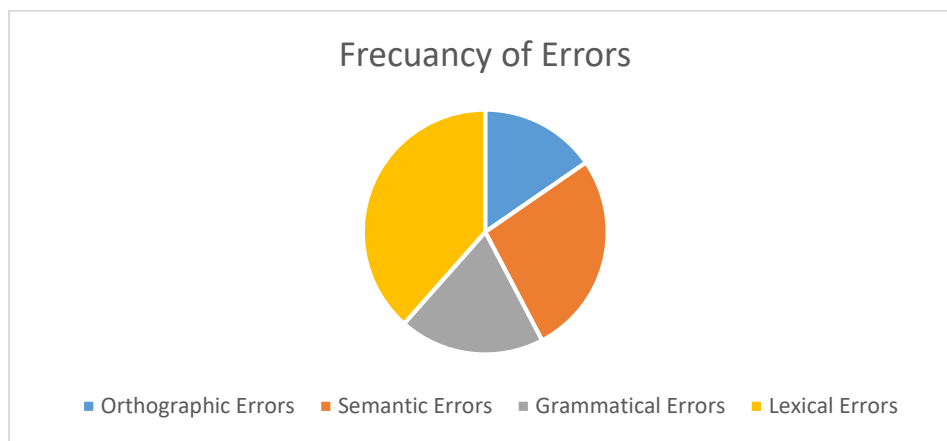
Figure 2: Frequency of errors

5. CONCLUSION

This study underlines some of the challenges and weaknesses of artificial intelligence tools, particularly Google Translate, and ChatGPT, concerning the translation of specific terms pertinent to special needs terminology from English into Arabic. Quantitative and qualitative methods were combined in this study to present mixed-method approaches that exposed several translation inaccuracies in lexis, semantics, grammar, and orthography. The inefficiency of the two AI tools in conveying the subtleties and contextual meaning requisite for AVT in this specialized domain was revealed by analyzing data from five films selected for people with specific needs. These results mean that while AI tools are increasingly being applied to general translation tasks, they remain underdeveloped in dealing with such complex, context-dependent content as special needs terminology, which requires high levels of precision and cultural sensitivity.

The results of the study are very informative for translators, AI developers, and end users. These findings should really be driven home to translation professionals: Although AI tools may be useful and more proficient in contexts such as specialized fields, full human control should still be maintained over these tools because they are still at a stage where complete accuracy and richness to provide reliable translations in the said context cannot be achieved. The development of such an AI system will be in a position to offer significant benefits to developers of AI systems in their quest to improve AI translation technologies and the terms and structures that it is supposed to handle. In addition, this research recommends the conduct of diachronic studies in the future aimed at monitoring progress and advancement made in AI-based tools, including their applications to specialized domains. And as AI continues to evolve, it will be ongoing efforts of refinement with which these technologies expand their usefulness and reliability in sensitive fields like special needs translation.

This study examined the quality of Google Translate and ChatGPT when translating special needs terms from English into Arabic. It also aimed to examine the degree of adequacy and fluency made by these two platforms' outputs. However, there are some limitations to this study. First, the sample size of this study is relatively small, consisting of 60 instances extracted from five movies. This may limit the generalization of the study's findings; therefore, it is not a comprehensive sample for all AVT materials. Furthermore, the terms evaluated for errors relate to people with special needs, making the machine translation judgment inapplicable to more general terminology. Second, this study dealt with English movies, which errors may change in different languages.

5.1 Future research

The study proposes the following points for additional investigation:

1. Future research initiatives will go deeper into the field of machine translation accuracy to improve our understanding of the phenomena. This entails analyzing the accuracy of machine translation errors across a wide range of languages, given that systems operate differently across linguistic differences.

2. Systematically collecting a large and diversified dataset to accurately evaluate machine translation system performance, including various forms of Audio-Visual Translation (AVT) materials.

3. Emphasizing the use of human expertise, particularly that of professional translators, in evaluating machine translation accuracy. Such an approach has the potential to provide a more sophisticated understanding of the errors that occur in a professional evaluation situation

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