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Idiomatic Expressions in English-to-Persian Translation: Human vs. AI Performance

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Abstract

This study evaluates and compares the performance of two AI-powered large language models (LLMs), namely ChatGPT and DeepSeek, in translating English idiomatic expressions into Persian. Drawing on a typology of idiom translation strategies and employing a mixed-methods approach, this research study integrates both quantitative analysis of translation accuracy and qualitative examination of strategy use by both AI- and human-translators. A total number of 75 idioms, selected from five thematic categories, Age, Beauty, Family, Food, and Clothes, were translated by the two AI models and benchmarked against expert-validated human translations. The idioms were sourced from a frequency-sorted thematic index and evaluated for acceptability by five Iranian experts in English language with final accuracy checks by a Persian literature specialist. The research findings indicate a clear advantage for ChatGPT over DeepSeek in both accuracy and strategic alignment with human translators. Quantitatively, ChatGPT has produced a significantly higher rate of acceptable translations, while DeepSeek has generated over twice as many non-acceptable and often irrelevant translations. Qualitatively, both models have employed various translation strategies, yet ChatGPT has shown more alignment with human translation norms and superior capacity in handling the complexities of idiomatic language than DeepSeek.

1. INTRODUCTION

Knowing a language includes knowing simple words and compound words, and their meanings; it also means knowing idioms, which are fixed phrases, the meanings of which cannot be inferred from the meanings of the individual words. All languages have idioms, phrases, and sentences that cannot be understood literally (Khosravi & Khatib, 2012), and English is not an exception; English has many thousands of such idiomatic expressions, suitable for expressing a speaker's intentions in different situations (Khosravi & Khatib, 2012). Idiomatic expressions play an indispensable role in the construction of interpersonal meanings, the formation of coherent texts, and the creation of stylistic effects, and can even balance between routinized expression and linguistic creativity (Fernando, 1996). Baker (1992, p.63), emphasizing the fixed nature of idiomatic expressions and their resistance to change, defined idioms as "frozen patterns of language which allow little or no variation in form and often carry meanings which cannot be deduced from their individual components." Thus, foreign language users may not have a true understanding of the meaning of an idiom, mostly because "the true meaning of an idiom generally cannot be determined by a knowledge of its constituent parts" (Collis, 1994, p.5).

Idioms can be considered as a part of everyday language; they are the essence of any language and can still be the most problematic to handle (Adelnia & Vahid Dastjerdi, 2011). It is also believed that a language, deplete of idioms, is unattractive; words are considered as a skeleton of the language, and the idioms are like its soul, thus wrong translation of idioms may damage the soul of the language (Ghaffari, 2001). Besides, idioms play an important role in language teaching and learning (Wray, 2000); Maisa and Karunakaran (2013) in their study assured that formulaic language expressions such as idioms, collocations, and phrasal verbs play a crucial role in enhancing language fluency and motivating students.

Still, one point worth mentioning is that idioms are not just random expressions of language; in fact, idioms serve as the foundation for a culture's traditions and shared beliefs, influencing the way people interact, think, and view the world (Hamdan, 2024). These cultural distinctions and figurative aspects of idiomatic expressions may cause certain difficulties for language teachers and learners and more importantly translators; translators may confront major difficulties in rendering idioms into other languages since translating an idiom, a fixed phrase of unchangeable form and fixed, metaphorical and indirect meaning (Ghazala,2008), necessitates thorough knowledge of the context of the language, the cultural idiosyncrasies and nuanced semantics of idioms in the translation process (Hamdan,2024). In fact, the phenomenon of translation is an intercultural activity, and one of the most challenging tasks for all translators is rendering culture-bound elements since they are tied to the specific cultural context where the text originates (Armellino,2008). Nida's (1964) concept of cultural equivalence suggests that a successful translation is not just a mechanical transference of words since it should also allow the target audience to resonate with the material as deeply as the original audience, navigating linguistic barriers and cultural chasms. Undoubtedly, idiomatic expressions are amongst the most culture-specific items that cannot be translated literally (Khosravi & Khatib, 2012); therefore, it is important to know how professional translators handle them. It is also believed that translating idioms is a sensitive issue since sometimes it either leads to the increase of cultural gaps or it doesn't let these gaps be filled (Khosravi & Khatib, 2012).

The widespread expansion of artificial intelligence (AI) and large language models (LLMs) in particular has the potential to revolutionize the field of translation since the translation process can be conducted in a much faster and more cost-effective manner. ChatGPT, an LLM developed by OpenAI, is one of the most powerful natural language processing systems available today, which is trained on huge amounts of text data, allowing it to generate human-like responses and comprehend multifaceted contexts with remarkable precision (Barton,2025). Quite recently, a new LLM, DeepSeek, was introduced as an opponent to ChatGPT, as it is claimed that it enjoys the same capabilities as ChatGPT, but it was developed on a lower budget (Barton,2025). Thus, investigating the potential of these newly developed chatbots in the field of translation in general and translation of idiomatic expressions in particular can help illuminate the way they handle language differences in different cultures while preserving the meaning and purpose of idiosyncratic idiomatic expressions, strongly culture-bound language elements (Armellino, 2008). In addition, understanding the way LLMs conduct translating idiomatic expressions from English into Persian, two culturally different languages, can help AI researchers design more accurate, culturally sensitive, and effective translation systems. In fact, expert human translators intrinsically possess rich cultural insights, based on their lived experiences, which allow them to discern cultural nuances in the process of translation instinctively. Therefore, investigating the strategies used by AI chatbots and human translators could illuminate the degree of advancement of AI tools in handling the tasks formerly performed solely by humans and the degree to which they can simulate human behaviors in certain tasks, i.e., translation of idioms. In addition, AI offers scale, speed, and cost advantages over humans (Abu-Rayyash, 2024), thus investigating the capabilities of AI models in translation could be quite insightful and informative regarding the possible application of this nascent technology in translation and more specifically, rich culturally-bound elements of the language, i.e. idiomatic expressions.

1.2. The Research Questions

1. To what degree do ChatGPT and DeepSeek perform successfully when it comes to translating idiomatic expressions?

2. Is the frequency of use of each strategy of translation by the two chatbots comparable to that used by human translators?

3. What are the major strengths or limitations of each chatbot in the translation of idiomatic expressions?

2. LITERATURE REVIEW

2.1. Definition of Idioms

Idioms are linguistic expressions representing concepts or phenomena of material life, which are particular to a given culture (Adelnia & Vahid Dastjerdi, 2011). Necessary to any language in order to keep the local and cultural color of that language and carrying certain emotive connotations, idioms are defined as a string of words the meaning of which are different from the meaning conveyed by the individual words (Larson, 1984) Idioms are also defined as complex lexical items, longer than a word form but shorter than a sentence whose meaning cannot be derived from the knowledge of its component parts (Gramley & Pátzold, 2003). Seidl and McMordie (1988) define idioms as a number of words taken together that have a different meaning from the individual meanings of each word. Similarly, Brenner (2003) characterizes idioms as a unit, i.e., two or more words together that have a special meaning, different from the literal meaning of individual words.

Semantically speaking, some scholars (e.g., Wood, 1981; Cowie et al., 1983; Alexander, 1987; Fernando, 1996; Moon, 1998b) proposed different scales or continuums of idiomaticity. Grant (2003), summarizing the scales used by aforementioned scholars, proposed six categories of a) semi-idioms including at least one word connected to its literal meaning (e.g. white lie), b) semi-opaque idioms whose meanings can be guessed but not easily (e.g. sail too close to the wind), c) pseudo-idioms including an element that has no meaning on its own (e.g. spic and span), d) pure idioms, well-formed idioms, or idioms of decoding that have both literal and non-literal meaning (e.g. kick the bucket), e) full idioms which consist of constituents whose ordinary meanings are not related to the idioms' semantic interpretations (e.g. butter up) and f) figurative idioms that have figurative meanings besides current literal interpretations (e.g. catch fire). All in all, three themes of compositionality, institutionalization, and degree of frozenness or fixedness is repeated in all the definitions of idioms; first, the idioms are non-compositional since their meanings are not the sum of the meanings of their parts; secondly, they are institutionalized which means they are commonly used by a large number of people in a speech community; and finally, the idioms are frozen and fixed but the degree of their frozenness varies (Grant, 2003).

2.2. Idioms Translation

Translating idiomatic expressions from one language to another is a challenging process as the correct identification of idiomatic expressions is a daunting task (Mollanazar, 2004) and even the identified idiomatic expressions are difficult to be directly translated between languages due to cultural factors (Strakšien, 2009); the complicated nature of cultural references underlying idiomatic expressions (Hamdan,2024) may pose difficulties in the process of translation since identification of direct equivalences for idioms across languages, particularly when the idiomatic expressions include culturally specific elements is rather challenging (Strakšien, 2009). In fact, deeply influenced by cultural roots, resulting in diverse connotations and emotive associations across different linguistic and cultural contexts, idiomatic expressions are difficult to translate (Oualif, 2017). Moreover, Newmark (1988) explores idioms' translation, points out that matching the meaning of idioms with their equivalent occurrences in the TL is a difficult process as lexical issues such as words, collocations, and settled phrases or idioms as major barriers for translators.
Baker (2011) further elaborates on difficulties in idioms translations, namely, the difficulties in effective detection of idioms, translation of idioms, and transmit of the different parts of meaning contained in idiomatic expressions into the TL.

2.3. Translation Strategies

Vinay and Darbelnet (1958), focusing on the translation process, introduced the term "procédé technique de la traduction", the English equivalent of which is "translation procedure", referring to all the processes that are involved in translating from one language to the other. In fact, Vinay and

Darbelnet (1958) intended to propose a global translation theory, depending on presenting a whole text of equivalence gained from comparing and translating two languages, which is composed of three linguistic levels: morphosyntactic (*agencement*), lexical (*lexique*), and semantic (*message*). Newmark (1988), using Vinay and Darbelnet's (1958) term of translation procedures, differentiated between "translation methods" which are related to whole texts and "translation procedures" which are used for translating sentences and the smaller units of language. However, Mason (1994) in his discussion of "translation techniques" does not differentiate between" translation procedures" and "translation methods"; Mason (1994) talks about translation strategies, referring to them as" translation procedures" as a method adopted to achieve a result. All in all, the concept of "translation strategies" has become widespread among researchers studying the translation process; in fact, the term "translation strategies" is used to refer to the operations and procedures the translator undergoes mentally while translating (Kim & Zhu,2019).

2.4. Baker's (1992) Translation Strategies for Idiomatic Expressions

Translation of idiomatic expressions, deeply rooted in culture, is a demanding task since languages contain concepts differing radically from those of another, mostly because each language organizes the world differently (Culler, 1976). Addressing the challenges that translators are faced with in the process of translation of idioms, Baker (1992) presents a taxonomy of four translation strategies of idiomatic expressions which is used in a number of research studies (e.g., Hamdan, (2024); Abdelwahab & Abdelwahab, (2022); Owji, (2013); Khosravi & Khatib, (2012)). The strategies of idiomatic expressions proposed by Baker (1992) are elaborated:

(1) Using an idiom of similar meaning and form**:** This strategy involves employing an idiom in the TL that conveys roughly the same meaning as the source-language idiom and consists of equivalent lexical items. However, achieving such a match can only occasionally be accomplished.

(2) Using an idiom of similar meaning but dissimilar form: In this approach, translators may find an idiom or fixed expression in the TL that has a meaning similar to that of the source idiom or expression, but with different lexical items

3) Translation by paraphrase: This strategy is the most common when a suitable match cannot be found in the TL, or when using idiomatic language in the translated text may not be appropriate due to stylistic differences between the source and TL.

(4) Translation by omission: Similar to omitting single words, an idiom may sometimes be omitted altogether in the translated text. This could occur because there is no close match in the TL, its meaning cannot be easily paraphrased, or for stylistic reasons.

2.5. Translation and Technology

The rapid advancement of technology has had a profound impact on various aspects of human life, including the field of translation studies; for many years, researchers, have been striving to automate the translation process, aiming to convert text from a source language (SL) to a target language (TL) (Quah,2006). However, this endeavor has been challenged by the complexity of human language, including nuances and idiomatic expressions unique to each language; in fact, these challenges have led to doubts regarding the effectiveness of machine translation (MT) (Mohsen& Мохсен, 2024; Al-Wasy & Mohammed, 2024). As artificial intelligence (AI), culminating in sophisticated algorithms that address intricate problems and streamline human endeavors (Hossain, 2023), has undergone transformative developments in recent years, it has rekindled optimism in the field of translation, suggesting that AI can perform satisfactorily in this field. The background of this optimism lies in the abilities of AI to utilize advanced computational models to transcribe textual or auditory content from one language to another (Sennrich et al., 2017; Vaswani et al., 2018).

The recent widespread use and emergence of Large Language Models (LLMs), including ChatGPT, pre-trained on multilingual datasets which teach them to recognize patterns, parse syntax, and grasp

contextual links between different languages (Farghal & Haider,2024), raises curiosity with regard to the potential applicability of these models in translation in a number of studies (e.g., Farghal & Haider (2024); Karaban and Karaban (2024); Abu-Rayyash (2024); Mohsen & Moxceн (2024)). More importantly, the fact that ChatGPT adopts a comprehensive data-driven methodology, assimilating a diverse corpus spanning numerous linguistic styles and thematic domains, renders ChatGPT a versatile instrument for translation endeavors (Malik et al., 2023); yet, it lacks adequacy in providing good text outputs for low-resource languages and sometimes generates subtle word-level hallucinations (Hendy et al., 2023).

Farghala & Haider (2024), in their research study, examine the translation of 15 individual Classical Arabic verses by comparing the English renditions provided by a human translator and two prominent large language models (LLMs), namely Google's Gemini (GEM) and OpenAI's ChatGPT (GPT). The human and LLMs are evaluated in relation to three variables: thematic clarity, creativity, and prosody by 54 Arab professors of Literature, Linguistics, and Translation majors who use English as a medium of instruction at their universities and are considered qualified as assessors. The two LLMs also evaluate the translations. The findings suggest that participants' assessment of human and GPT translations are clearly positive on the three variables; while GEM significantly lags behind in terms of prosody and even more so in its own assessment, GPT is consistence with the participants' evaluations. Still, another study by Karaban and Karaban (2024) provides a detailed comparative analysis of translations of twelve poems of a Ukrainian poet, Ivan Franko, conducted by translator Percival Cundy and GPT-3.5. Using various manual and automatic analytical research methods and techniques, the translations' merits, demerits, and eight essential qualitative and quantitative linguistic and poetic characteristics were analyzed. The results obtained sufficiently prove the hypothesis that AI-rendered translations are comparable to human translations in terms of quality and poetic features. Moreover, another study by Abu-Rayyash (2024) explores the viewers' experience of GPT-4-generated humor translations compared to human translations for dubbing purposes. To that aim, a group of cinephiles was provided with humor dialogues translated using both GPT-4-generated and human translations and were then asked to fill out a questionnaire evaluating five constructs of quality, comprehension, enjoyment, perception, and suggestions for improvement. The results of data analysis indicate that GPT-4-generated translations can offer an equivalent or even superior viewers' experience to human translations. Still, in another study, Mohsen& Moxceн (2024) study a corpus comprising 20 abstracts sourced from peer-reviewed journals indexed in the Clarivate Web of Science, specifically the Journal of Arabic Literature and Al-Istihlal Journal. The abstracts, equally divided to represent both English-Arabic and Arabic-English translation directionality, were evaluated by a comprehensive evaluation rubric adapted from Hurtado Albir and Taylor (2015), focusing on semantic integrity, syntactic coherence, and technical adequacy. Three independent raters carried out assessments of the translation outputs generated by both Google Translate (GT) and two large language models (LLMs), namely ChatGPT3.5 and ChatGPT4. The Results from quantitative and qualitative analyses indicated that LLM tools significantly outperformed GT outputs in both Arabic and English translation directions.

Additionally, ChatGPT4 demonstrated a significant advantage over ChatGPT3.5 in Arabic-English translation, while no statistically significant difference was observed in the English-Arabic translation directionality. Qualitative analysis findings also indicated that LLM tools exhibited the capacity to comprehend contextual nuances, recognize city names, and adapt to the target language's style. Conversely, GT displayed limitations in handling specific contextual aspects and often provided literal translations for certain terms.

3. RESEARCH DESIGN AND METHODOLOGY

This research study is of a mixed-methods research design. In fact, it is carried out within the framework of descriptive approach of the comparative model of translation research in which translation equivalents produced and translations strategies utilized, by two LLMs, i.e., ChatGPT (GPT-4o) and DeepSeek (DeepSeek- R1), are compared to translation equivalents produced and translation strategies used by human translators. Moreover, a quantitative approach, seeking to determine the percentage of acceptability of AI-generated translations and the most commonly utilized strategy by AI while translating idiomatic expressions, is applied in this study.

4. MATERIALS

Despite the fact that idiomatic expressions may appear quite arbitrary, there still exist certain structures and thematic organizations among them (Kovecses & Szabco, 1996). For example, there is a wide range of idioms related to themes of nature, animals, body parts, sports, specific names, food, colors, and all the senses, which are used to describe personality, appearance, work, health issues, and many more (O'Dell & McCarthy, 2010). Thus, a thematic selection of idiomatic expressions for the sake of conducting a research study on idioms' translation proves to be logical. In the present study, a list of idioms, which are sorted according to their frequencies under their theme-based categories and adopted from Rafatbakh and Ahmadi (2019), is used. The list of idioms is based on a thematic index of 1506 idioms at the end of the Oxford Dictionary of Idioms under 81 categories in the largest freely available corpus, i.e., the Corpus of Contemporary American English (COCA), which is composed of more than 520 million words. Of 81 topics sorted by their frequencies of occurrence and developed by Rafatbakhsh and Ahmadi (2019), a total number of 75 English idiomatic expressions of five thematic categories of age, beauty, family, food, and clothes were selected.

5. TRANSLATION PROCESS

The total number of 75 English idiomatic expressions of five themes of age, beauty, family, food, and clothes were translated into Persian, using the online dictionary of Abadis, Aryanpur Progressive English-Persian Dictionary (2005), 1001 English idioms with Persian Translation (Aliakbari et al., 2023), and Farhang Moaser (2014). Then, the translation of idiomatic expressions was presented to 5 Iranian English language experts. The English language experts were bilingual English language teachers of at least 5 years of teaching English experience with academic degrees in English literature, translation, and teaching major at the MA and PhD levels, whose mother tongue is Persian. Among participants, whose age range fell between 27 to 43, 2 were male and 3 were female. The best Persian translations for English idiomatic expressions, selected according to the judgments and decisions of the language experts, were later presented to a PhD candidate in Persian literature, who is fluent in English, for the final selection of the list of equivalents. The same list of idiomatic expressions was translated into Persian by ChatGPT and Deep Seek. The AI translation equivalents were judged by the language experts for their accuracy and fluency, and those that were considered as acceptable translations were classified using Baker's (1992) strategies of idioms' translation. Applying Baker's (1992) strategies of translation, the human and AI-translated idioms were classified into 3 categories of 1) Using an idiom of similar meaning and form, 2) Translation by paraphrase, and 3) Using an idiom of similar meaning but dissimilar form. The translation strategy of Translation by omission, similar to omitting single words, through which an idiom may sometimes be omitted altogether in the translated text, was not included in the categories of translation strategies used in the present study since it is applicable to the translation of idioms in a context and not to the translation of single idiomatic expression.

6. DATA ANALYSIS AND FINDINGS

This study adopts a mixed-methods approach, integrating both quantitative and qualitative analyses, to triangulate findings concerning the translation of idiomatic expressions by GPT and DeepSeek. The investigation centers on two key dimensions: (1) the overall quality of idioms' translations generated by each large language model (LLM), and (2) the translation strategies employed by each LLM in comparison with those of human translators.

In the quantitative phase, the initial stage involved the extraction and categorization of AI-generated equivalents of selected idiomatic expressions. A panel of language experts evaluated these equivalents, and the results were quantified and illustrated through comparative visualizations. These visualizations reflect the proportion of acceptable versus non-acceptable translations across five thematic categories: age, beauty, family, food, and clothing.

Figure.1.GPT-rendered Translation

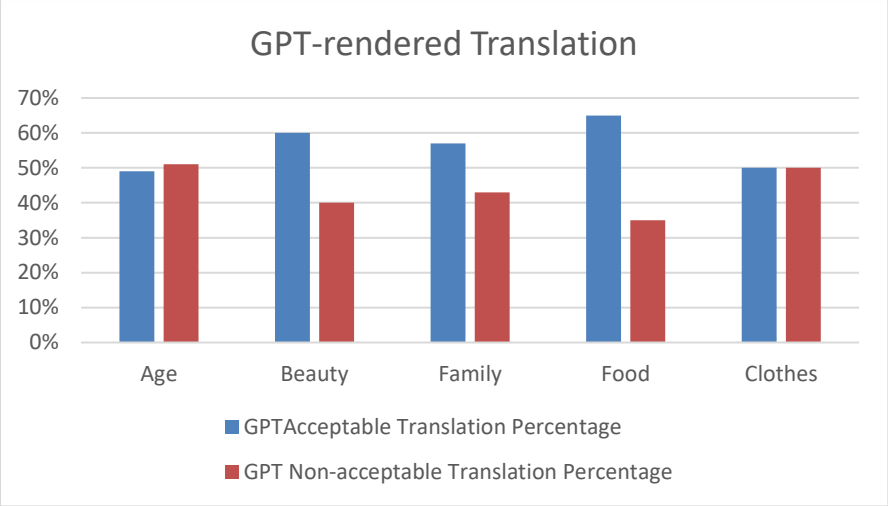

Figure 1, titled *GPT-rendered Translations*, presents GPT's performance in translating idiomatic expressions across the aforementioned categories. The findings reveal a moderate level of translation adequacy, with acceptable translation rates ranging between approximately 48% and 65%. However, GPT's performance appears to vary significantly across different thematic domains, suggesting inconsistencies in its handling of translation of different categories. Specifically, GPT demonstrates relatively higher translation adequacy in the domains of food and beauty, while notable deficiencies are observed in its treatment of idioms related to age and clothing. These results indicate that, although GPT exhibits a certain degree of idiomatic competence while its performance varies in different thematic categories.

Figure 2. DeepSeek-rendered Translation

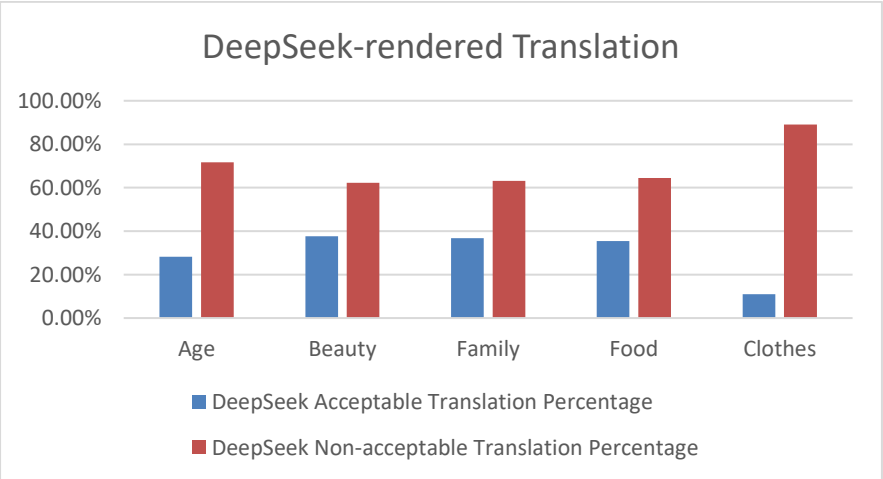

Figure 2, titled *DeepSeek-Rendered Translations*, presents the proportion of acceptable versus non-acceptable translations generated by DeepSeek across five thematic categories: age, beauty, family, food, and clothes. The data reveal a consistent pattern in which non-acceptable translations substantially outnumber acceptable ones in all categories. Although relatively higher rates of acceptable translations are observed in the categories of beauty and family (approximately 36%–37%), they remain markedly outweighed by non-acceptable outputs, which exceed 60% in both cases. The poorest performance is observed in the clothes category, where only 10% of the translations were deemed acceptable, in contrast to nearly 90% categorized as non-acceptable.

A comparative analysis of the translation performance of DeepSeek and GPT across the five thematic domains further highlights significant discrepancies in output quality and consistency. As reflected in the respective bar charts, DeepSeek demonstrates lower translation adequacy across all categories, with

non-acceptable outputs consistently dominating. In sharp contrast, GPT yields a higher proportion of acceptable translations in four out of the five thematic areas. Notably, GPT achieves its highest rates of acceptable translations in the categories of food (65%) and beauty (60%). Even in the relatively challenging category of age, GPT maintains an almost balanced output, with acceptable translations accounting for 48% of the total. Particularly in the category of clothes, GPT outperforms DeepSeek significantly, producing 50% acceptable translations compared to DeepSeek's 10%. These findings suggest that GPT handles semantically and culturally embedded idiomatic expressions with greater reliability and sensitivity than DeepSeek.

To further assess the qualitative dimension of idiomatic translation, the strategies employed by each LLM were compared against those used by experienced human translators according to Baker's (1992) taxonomy of translation strategies for idiomatic expressions. According to this framework, translation strategies can be classified into the following categories:

1. **Using an idiom of similar meaning and form**, where the target-language (TL) idiom conveys a meaning roughly equivalent to that of the source-language (SL) idiom and consists of corresponding lexical items.
2. **Using an idiom of similar meaning but dissimilar form**: where a TL idiom or fixed expression conveys a similar meaning to that of the SL idiom, but is lexically different.
3. **Translation by paraphrase**: the most frequently employed strategy in the absence of a suitable idiomatic equivalent in the TL, where the meaning of the SL idiom is rendered through rewording or explanatory phrasing.
4. **Translation by omission**: where the idiom is excluded from the translation entirely. This strategy, however, was not considered in this study, as the idioms were examined in isolation and not within extended textual contexts.

To gain a better understanding of the three translation strategies, the table below presents the translation strategies used in the process of translation of idiomatic expressions, based on Baker's (1992) typology of translation strategies, from English to Persian.

Table1. Idioms' Translation Strategies

English Idiom	Persian Translation	Translation Strategy Applied
over the hill	آفتاب لب بوم	Using an idiom of similar meaning but dissimilar form
have one foot in the grave	یک پا لب گور بودن	Using an idiom of similar meaning and form
second childhood	وقتی افراد به دوران پیری و سالمندی میرسن رفتارشون بچه گونه میشه، به این مرحله از زندگی میگن	Translation by paraphrase

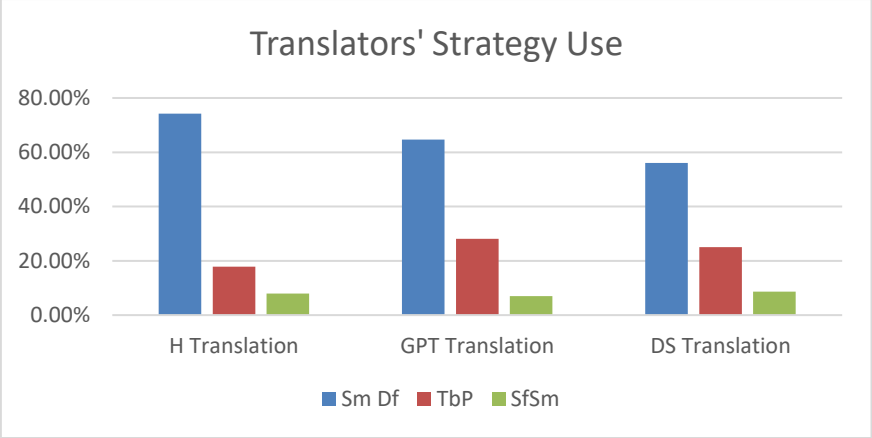

Figure 3. Translators' Strategy Use

Figure 3, titled *Translators' Strategy Use*, presents a comparative overview of the frequency with which three translation strategies, 1. using an idiom of similar meaning but dissimilar form (SmDf), 2. translation by paraphrase (TbP), and 3. using an idiom of similar meaning and form (SmSf) are employed by human translators, GPT, and DeepSeek. The results indicate that the SmDf strategy is the most frequently utilized across all three translator types. Human translators exhibit the highest reliance on this strategy, employing it in approximately 73% of cases, followed by GPT at around 65%, and DeepSeek at roughly 57%.

Notably, GPT demonstrates a greater tendency to employ the paraphrasing strategy compared to both human and DeepSeek. Specifically, GPT resorts to paraphrasing in 28% of the cases, in contrast to 25% for DeepSeek and 17% for human translators. This suggests that GPT may favor a more flexible approach in translation in cases where direct idiomatic equivalents are unavailable or unnatural in the target language.

Conversely, the SmSf strategy, where idioms with both similar meaning and lexical form are used, is the least frequently employed across all three translator types, with marginal variation: human translators (approximately 7%), GPT (6%), and DeepSeek (8%). This low usage reflects the limited availability of direct idiomatic correspondences between English and Persian and underscores the importance of strategic flexibility in idiom translation.

To further examine the application of translation strategies across thematic categories, the percentage distribution of each strategy,1. using an idiom of similar meaning but dissimilar form (SmDf),2. translation by paraphrase (TbP), and 3. using an idiom of similar meaning and form (SmSf), was calculated for each of the three translators: human translators (Human T), GPT (GPT T), and DeepSeek (DS T). Figure 4, titled *Translators' Translation Strategy Use per Theme*, provides a comparative visual representation of strategy deployment across five thematic categories of age, beauty, family, food, and clothes.

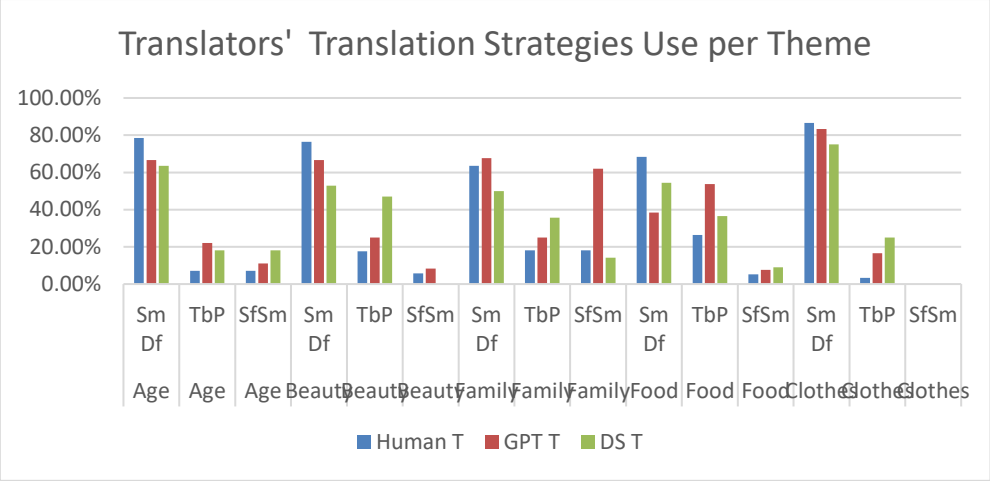

Figure 4. Translators' Translation Strategy Use per Theme

The findings indicate that ChatGPT generally outperforms DeepSeek in approximating human translators in the application of translation strategies, especially in maintaining conceptual similarity through the use of translation strategy of using similar meaning but dissimilar form. While both large language models (LLMs) tend to overuse the translation strategy of translation by paraphrase, ChatGPT demonstrates a greater consistency in following human patterns. DeepSeek shows more variation and less predictability in its strategic alignment. The strategy of **similar form and meaning (Sf Sm)** was used **infrequently** across all translators, both human and AI, indicating that it is not a preferred approach for handling idiomatic expressions. Human translators consistently show the lowest use of the similar form and meaning (Sf Sm) strategy across all themes while AI translators on the other hand show different trend of the use of this strategy use; ChatGPT-based translations show slightly higher range of the usage of Sf Sm, particularly in the thematic categories of family and food while DeepSeek translations display moderate use of this translation strategy.

At the next stage of data analysis, to gain a more comprehensive understanding of the two AI models' performance in translating English idiomatic expressions into Persian, the non-acceptable translation outputs, evaluated by expert judges, were further classified into two broad error types: literal translations (Literal T), representing word-for-word renderings of idioms, and irrelevant translations, which fail to convey the intended meaning of the source expressions. These classifications are visually represented in Figure 5, titled *AI-rendered Non-Acceptable Translation*.

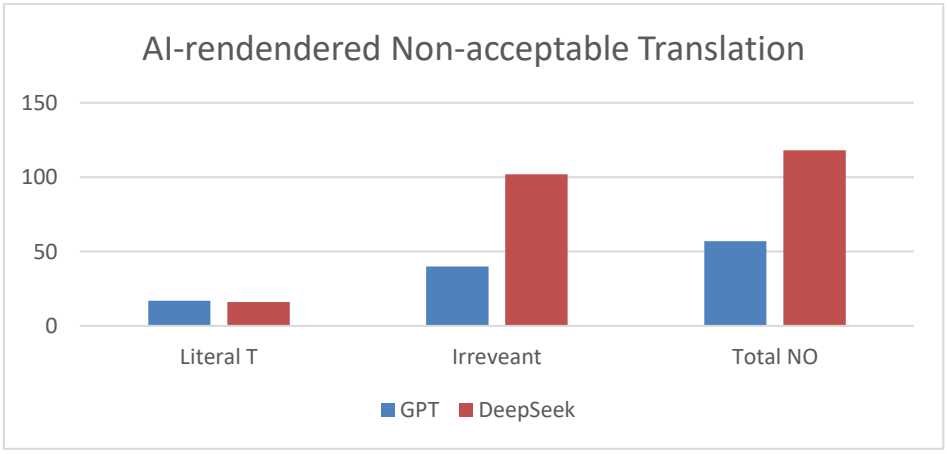

Figure 5. AI-rendered Non-acceptable Translation

The comparative analysis reveals that both ChatGPT and DeepSeek generated a limited number of literal translations, with each model producing approximately 15 instances. However, a marked disparity is observed in the frequency of irrelevant translations. DeepSeek produced over 100 irrelevant

outputs, significantly exceeding the approximately 40 generated by ChatGPT; in fact, DeepSeek's total count (118 instances) is more than double that of ChatGPT (approximately 55 instances). These findings suggest that ChatGPT demonstrates a comparatively more robust capability in processing idiomatic and non-literal expressions. At the same time, DeepSeek appears to encounter greater difficulty in capturing figurative meaning, resulting in a higher incidence of semantically irrelevant translations.

7. DISCUSSION AND CONCLUSION

This study aimed to systematically evaluate and compare the translation performance of two AI-driven language models, ChatGPT and DeepSeek, in rendering English idiomatic expressions into Persian. The major focus of the study was on translation quality and the strategic choices made by each model, drawing on Baker's (1992) typology of idioms translation strategies. Through a mixed-methods approach that integrated quantitative assessments of translation acceptability with qualitative analysis of strategy use, the study offers a comprehensive insight into the models' capabilities in handling figurative and culturally embedded language.

Quantitative findings clearly favor ChatGPT, which consistently outperformed DeepSeek across all five thematic categories of age, beauty, family, food, and clothes. In each domain, ChatGPT produced a substantially higher percentage of acceptable translations. Notably, DeepSeek generated more than twice the number of non-acceptable translations, the majority of which were rated as irrelevant by expert evaluators. This discrepancy highlights a significant limitation in DeepSeek's ability to capture and translate the figurative and cultural nuances that idiomatic language often entails.

Qualitative results further reinforce ChatGPT's comparative advantage; while both AI models employed various translation strategies, the dominant approach across all translator types, human, GPT, and DeepSeek, was the use of idioms with *similar meaning but dissimilar form*. ChatGPT exhibited a strategic pattern closely aligned with human translators, consistently applying this preferred strategy across thematic categories. Additionally, GPT's use of paraphrasing appeared more deliberate, particularly in instances where no direct idiomatic equivalent existed in Persian. In contrast, DeepSeek's strategy usage lacked the same level of consistency and showed weaker alignment with human translation conventions, often resulting in less predictable and semantically inadequate renderings.

Taken together, these findings highlight ChatGPT's superior performance in both the quantitative and qualitative dimensions of idioms translation; GPT's ability to retain semantic meaning and convey culturally appropriate equivalents positions it as a more reliable and sophisticated tool for translating figurative language. By contrast, DeepSeek's limitations in both translation quality and strategic fidelity suggest a need for further development in idiom processing. In fact, the findings of the present research are in line with the studies conducted by Farghal & Haider (2024) and Mohsen& Моксен (2024), which show superiority of GPT over other AI tools in translation. In addition, the results of the analysis of comparability of the performance of the two AI translators, GPT and DeepSeek, with human translators in terms of translation strategies are aligned with the results of the study conducted by Abu-Rayyash (2024), which suggest an equivalent or even superior performance of GPT to human translators.

Limitations of the Study and Suggestions for Further Research

While the present study provides robust evidence of ChatGPT's superior performance in idiom translation tasks, several limitations should be acknowledged. First, the scope of idiomatic expressions was limited to five thematic categories, which, although thematically diverse, do not exhaust the full range of idiom types encountered in natural language. Future research would benefit from expanding the idiomatic dataset to include additional categories, including culturally bound or context-specific idioms.

Second, the idioms were assessed in isolation, devoid of surrounding textual context. As idiomatic expressions often derive much of their meaning from context, future studies should incorporate full-

text environments to evaluate how effectively AI models navigate figurative language within broader discourse structures.

Furthermore, given the rapid development of large language models, longitudinal assessments will be essential to track performance improvements over time. Besides, comparative analyses involving a wider range of AI models, such as Claude, Gemini, could offer deeper insights into the relative strengths and weaknesses of these emerging technologies.

In conclusion, this study contributes to the growing body of literature on AI translation capabilities by offering empirical evidence of ChatGPT's relative strengths in handling idiomatic language. As AI tools become increasingly integrated into the professional translation field, ongoing evaluation remains critical to ensure linguistic precision, cultural fidelity, and ethical alignment with human language use.

Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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