

Examining the Cultural Connotations in Human and Machine Translations: A Corpus Study of Naguib Mahfouz's *Zuqāq al-Midaqq*

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Abstract—The translation of culture-specific terms constitutes a major challenge for professional translators as it necessitates a thorough understanding of both the linguistic and cultural elements. With rapid technological advancement over the past few years, machine translation has enhanced translation quality. This study investigates the transability of cultural connotations in the Arabic-English translation of Naguib Mahfouz's *Zuqāq al-Midaqq*. A descriptive qualitative research design was adopted to achieve the intended goals of the study. The data comprised human and machine translations from Google Translate and ChatGPT. Through qualitative content analysis, the translations were compared for accuracy in transferring the cultural connotations prevalent in the Arabic source text. The findings revealed that the human translation showed greater naturalness and accuracy in rendering cultural connotations. Machine translation has struggled with rhetorical devices, idioms, and cultural nuances. The results also indicated that the AI-enhanced machine represented by ChatGPT captured the cultural elements more effectively than Google Translate. The study concluded that human expertise remains essential for the high-quality translation of literary works to maintain cultural significance. The findings can inform translator training and guide improvements to AI-enhanced translation for literary texts.

Index Terms—machine translation, human translation, artificial intelligence, GhatGPT, corpus, literary texts

I. INTRODUCTION

In its broad sense, machine translation is defined as the usage of computers to translate a given text from one language into another (Wang et al., 2021, p. 143). It is a sub-field of computational linguistics through which texts are automatically translated from one text into another using a computing device (Garg & Agarwal, 2018). The core mechanism of its algorithm is to integrate the corresponding relationship between both languages into the word database beforehand (Lihua, 2022, p. 1). With the rise of technology usage in different educational sectors, there has been a growing interest in the differences between AI-based machine translations and human translations. Despite the advancements in machine translation in many aspects, including cost, speed, confidentiality, and acceptance, there is still ongoing debate about whether machine translation is as effective as human translation (Afzaal, 2022, p. 1). Therefore, using corpus-based investigations has become important in evaluating the efficacy of machine and human translation. Such examination could involve exploring extensive sets of language data to gain insights into the benefits and limitations of both methods. Traditionally, Translation Studies have focused on the linguistic aspects of the translation process, such as word choice syntax. Due to globalization, where there has been a great need to communicate across cultures, the focus has moved towards transferring the cultural elements in the given discourse. This has been known as a cultural turn in Translation Studies (see Lefevere, 1992). Newmark (1988) defines culture as "the way of life and its manifestations peculiar to a community that uses a particular language as its means of

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expression" (p. 94). In its core function, machine translation relies on algorithms. These algorithms do not consider the cultural aspect of the translation process. Thus, human action is needed to fill this gap. In addition, machine translation does not provide annotations for words or phrases with a cultural dimension. On the other hand, human translation considers the cultural and social dimensions since the translator is aware of the context and culture.

II. SIGNIFICANCE OF THE STUDY

Transferring cultural elements in translation is a complicated and challenging task that necessitates a profound comprehension of both the source text (ST), source culture (SC), target text (TT), and target culture (TC). However, machine translation makes this process more complex since algorithms can struggle to accurately capture the cultural references embedded in the original text. This corpus-based study investigates the transfer of cultural elements in AI-based machine translation and human translation. By evaluating the results of both AI-based machine translation and human translation in transferring culturally specific references, the researchers hope to offer practical evidence to the translators when it comes to the usage of AI-based machine translation. Moreover, this study holds significant consequences for improving machine translation technology. It provides insights to the specialized companies to consider the cultural boundaries in the machine translation industry.

III. STUDY QUESTIONS

The current study tries to find an answer to the following main questions:

1. How do human and machine translations vary in their competency to precisely convey cultural and linguistic elements in Naguib Mahfouz's *Zuqāq al-Midaqq*?
2. To what extent do cultural factors influence the accuracy and naturalness of machine translations?
3. Does the newly AI-enhanced ChatGPT render the cultural elements the same as Google Translate?

The current study adopts a case study to compare a machine-translated corpus and a human-translated corpus of the same source text. The source text was carefully selected to be culture-related as this type of text challenges machine translation due to cultural values and norms embedded in the text. The study first reviews the related existing theories on the subject matter, including the revision of similar studies conducted in the same research area. Then, the adopted methodology is explained in detail. The results are presented, discussed and further compared with previous studies.

IV. LITERATURE REVIEW

A. Translation of Literary Texts

When it comes to the translation of literary texts, this type of translation has been widely examined by researchers across different languages. It could be argued that literary translation is demanding and requires skillful translators with deep knowledge to do the job, presenting a unique set of challenges. These challenges include the differences in the source and target cultures as well as the writing styles of the writer and translator. Lotfipour-Saedi (1992) argues that when translating this type of text, the translator's role extends beyond rendering the original author's message in the target language. It further involves maintaining the author's way of saying it. In this vein, Toral and Way (2015) discuss that literary translators must be careful when choosing from the available translation choices. They say, "A key challenge in literary translation is that one needs to preserve not only the meaning but also the reading experience" (p. 240).

In his discussion of the challenges that face literary translation and translation, Yousef (2012) categorized these challenges into three categories: linguistic, cultural, and human. He argues that the literature language is demanding and different from the ordinary one on different levels, including phonological, syntactic, and lexical aspects. As for the cultural challenges, translators are now faced with the norms and values of the target culture, as the target text is seen as a product itself. The human challenges that face the literary translation are related to the translators' conditions, including the lack of professional training and financial support.

B. Machine Translation

With the rapid development in the AI field, there has been a growing interest in the role of machine-based translation. Nowadays, machine translation plays a predominant role in the translation industry by helping human translators be more productive and avoid translating from the beginning (Toral et al., 2018). Many researchers have researched MT using different languages and examined the differences between machine and human translation using different methodologies. Hasyim et al. (2021) examined the accuracy of machine translation, mainly Google Translate, in translating texts with culture-specific elements. The results showed that the main challenge resulting from the machine translation is the inappropriate cultural equivalence. Google Translate could not accurately identify the cultural elements embedded in the source text, leading to results that reflect literal translation. The researchers argue that such a challenge may be solved by refining those cultural elements through words and sentences from one language to another. In Lihua's (2022) study that examined the effectiveness of machine translation based on artificial intelligence, the results revealed that although the quality of translation is similar to that of human translation, the accuracy of the former

can not be guaranteed. This is due to the fact that the fundamental algorithm of MT remains software that evaluates the correctness based on computer programming. Such software lacks the ability to integrate social and cultural backgrounds to simulate human translation. Similarly, Alowedi et al. (2023) found that MT failed to capture the cultural context in translating Arabic poetry into English. The authors attributed this to the MT's inability to understand the cultural context in which the poetry originated.

When it comes to the translation of literary works, scholars have extensively examined the efficiency of machine translation in this type of translation. As far as literary texts are concerned, machine translation confronts a substantial challenge despite the huge development in this field (Torralba & Way, 2018). Metaphors that reflect a given culture's underlying values and translation methods have received great attention in translation studies investigating machine translations. Naeem (2023) found that Google Translate failed to render the intended meaning of Arabic metaphors when translating them into English. This is because GT lacks a deep understanding of both the linguistic and cultural legacies of the source and target languages. Comparing human translation with human one-metaphor translating, Shintemirova (2023) found that machine translation could only translate frequently and popular metaphors. However, the author argues that it was difficult for the machine to translate metaphor using what she calls "the context of the situation". The study recommends creating a larger database of metaphors for the machine to recognize during translation.

Using Google Translate and Q Translate, Omar and Gomma (2020) examined the efficiency of these two machine systems in English-Arabic literature translation. The machine translation was compared to that of human-made. The results found that machine translation resulted in errors related to vocabulary syntax and pragmatics, affecting the trustworthiness of the translated text. Another research on literary machine translation was conducted by Thai et al. (2022), who investigated machine translation efficiency in non-English language novels. The study results revealed that machine translation output had mistranslations, discourse-disrupting errors, and stylistic inconsistencies.

C. Translation of Literary Texts

Najib Mahfouz is considered one of the 2nd-century Egyptian writers whose works have been found influential not only in the Arab World but in the world as a whole. His works have been widely translated into many languages, where such translations have helped in bridging the existing cultural linguistic gaps. The English translation of Najib Mahfouz's novels has been addressed by many researchers, such as Dowaidar (2016), Demitry (2018), Obeidat and Mahadi (2019), Alhamshary (2021), and Battah (2023). The common aspect of all studies investigating the Arabic-English translation is their examination of the cultural-specific terms and elements. This can be attributed to Mahfouz's novels reflecting Egyptian culture and heritage. Dowaidar (2016) investigated humour translation in Najib Mahfouz's *Al-Qahira Aljadida* novel in terms of the cultural and linguistic losses that occurred during the translation process. One main result demonstrated that the English translation rendered the exact humour nature of the original, even if it succeeded in rendering the communitive meaning.

Similarly, Obeidat and Mahadi (2019) examined the errors in collocations translation from Arabic into English in Mahfouz's *Awlad Haritma* novel. The study indicated that cultural-specific collocations are the main reasons behind committing translation errors. The researchers recommended that translators carefully consider the connotations when transferring them into another language. Examining the strategies used in translating cultural bond terms included in Mahfouz' *Zuqaq El Midaq's* novel, Battah (2023) found that the translator adopted certain translation strategies when rendering those items. Literal translation and cultural substitution are the main strategies that were used.

Moving to using Machine Translation in translating Mahfouz's novels, the existing literature suggests that this domain has not been widely addressed despite notable technological advancements, including ChatGPT. The researchers have found only one study targeting the use of MT in translating Najib Mahfouz's novels. The study was conducted by Mehawesh (2023), who compared the human translation and machine translation (Google Translate) of Najib Mahfouz Bayn Al-Qasrain's novel. The results revealed that Machine Translation was not efficient enough to render the intended meaning of the items, especially those with cultural context. The researcher argues that the outcome of the machine translation did not present the same effect on the readers as that of the original due to the literal translation or the inability to convey a connotative meaning. The challenging nature of literary texts like Mahfouz's works requires researchers and scholars to explore the potential roles of AI-based machine translation, such as ChatGPT, in enhancing the translation process. Translators, for example, may use machine translation to have drafts upon which they can refine and edit manually. Therefore, this study explores AI-enhanced machine translation in translating Najib Mahfouz's novel *Zuqaq al-Midaqq*.

V. METHODOLOGY

A. Research Design

This study uses a descriptive qualitative research design involving comparative textual analysis. Creswell (2014) noted that qualitative textual analysis is well-suited for exploring linguistic and cultural nuances in textual data.

This study's textual data comprises selected excerpts from an Arabic novel and their English translations. The researchers mainly compared human and machine translations of selected cultural connotations. This comparison produces an in-depth examination of how each method conveys cultural connotations differently.

Abu Hamda et al. (2021) state that qualitative descriptive studies use linguistic and conceptual tools to follow data closely. Based on that, this study compares original cultural connotations from the Egyptian culture with their human and machine translations.

B. Data Collection

The data comprise two English translations of selected excerpts from the Arabic novel *Zuqāq al-Midaqq* by Naguib Mahfouz. The first set contains human translations done by professional translators. The translators hold doctorates in English language and linguistics. They have extensive experience working professionally as translators. They convert complex texts from English to Arabic and vice versa. Their expertise encompasses technical, literary, and specialized translation on various topics.

The second set contains machine translations and is represented by Google Translate and ChatGPT. Several excerpts with cultural connotations were intentionally selected from the novel based on their cultural resonance and metaphorical significance.

Published in 1947, *Zuqāq al-Midaqq* is considered one of the early masterpieces of acclaimed Egyptian writer Naguib Mahfouz. Set in the Midaq Alley neighborhood of Cairo during World War II, the novel provides a portrait of the residents living in the alley. The novel represents a microcosm of Egyptian society at the time. Through the intertwining stories of characters from different social classes, Mahfouz explores themes of social relations, morality, and gender roles within a rapidly changing world. Written in Mahfouz's realistic style, the novel candidly depicts issues like poverty, prostitution, and the struggle for independence in 1940s Egypt. The universal topics of ambition, love, and loss connect the characters' poignant stories, making *Zuqāq al-Midaqq* a moving and insightful work.

C. Data Analysis

The researchers followed the content analysis method to systematically analyze and compare the translations, codifying the textual data according to relevant criteria outlined by Krippendorff (2004) to uncover patterns and insights. Specifically, the analysis examined the translation techniques and cultural equivalence achieved for each cultural continuation through three main aspects - accuracy in conveying the core metaphorical meaning, preservation of cultural nuances and connotations, fluency, and naturalness in the target language. The analysis underscores the importance of human translation skills and cultural awareness to translate culture-specific terms properly. Qualitative contextualized analysis was undertaken to provide illustrative examples of challenging translations, divergence in technique, and implications for meaning and reader experience.

VI. RESULTS

This section lists the source Arabic extracts and their English translation performed by machine translations, specifically GhatGPT and Google Translate. The data are presented in Table 1.

Table 1 shows examples of extracts from the Arabic cultural connotation and their English translations done by humans versus machine systems, i.e., ChatGPT and Google Translate. As seen in the Table, there are two columns for translation - one by professional translators and one by AI-based machine translation. Additionally, there are also two columns for AI-based machine translation. One column is by ChatGPT, and one is by Google Translate. The cultural connotations were selected for their cultural resonance. The analysis compares how human and machine translations convey metaphorical and cultural meanings.

Preliminary observation shows differences in how humans and AI-enhanced tools have rendered the core meaning and cultural connotations. Further analysis will systematically examine the translation techniques and the accuracy of transferring cultural significance.

TABLE 1
THE TRANSLATION OF ALLEGORICAL PHRASES AND IDIOMS ACCORDING TO HUMAN AND MACHINE TRANSLATION

#	Source Text	Human Translation	Machine Translation	
			Google Translate	ChatGPT
1	يهبط عليه ملاك النعاس	You fall asleep by an angle	A drowsy angel descends upon him	Sleep's angel descends upon him
2	تسوقه قدماء الثقلتان	His leaden feet slowly led him out of the alley.	His heavy feet carried him	His heavy feet drive him forward
3	أم حسبت أن السماء تمطر ذهبًا وماسًا	Did you think the heavens would rain down gold and diamonds?	Or did you think that the sky was raining gold?	Or do you think that the sky rains gold?
4	مقلب ما بعده مقلب	It was a hilarious prank!	Prank after prank	A turn followed by another turn
5	المعاصر قد تكون أوقاته سيده، لكنه لا يسير في الأوقات الحسنة	Time may be a master, but it doesn't walk in good times	Contemporary maybe its times, but it does not go in the good old days	The contemporary may be a master of times, but it does not fare well in good times.

6	إنك من طينة أخرى يا محبوبتي	You are made of different stuff , my beloved.	You are of a different kind, my beloved	You are of a different caliber, my beloved
7	مسارب الدنيا	Surrounding activity	The paths of the world	The paths of the world
8	يضح بحياته الخاصة	It clamors with a distinctive and personal life of its own	He is full of his own life	He is buzzing with his private life
9	انذت الشمس بالمغيب	The sun began to set	The sun allowed it to set	The sun granted permission for the sunset
10	ليس لها من مطارح المجد الا تاريخها	The only things which suggest a past glory are its extreme age	It has no place for glory except its history	It has nothing in the ramparts of glory except its history
11	مما يلبسه الافندية	Worn by those who affect western dress	What the Mandarin wears	Among the clothing worn by nobles
12	كلانا من معدن واحد	We are made from the same metal ,you and I	We are both of the same metal	We are both of the same material
13	عجوز مهدم	A senile old man	A ruined old man	old and decrepit
14	جاءت نجدة من السماء	Just then help came as though from heaven	Help came from heaven	Help came from the sky.
15	اراك تكثر من الكيف	I can see you have been living fast lately	I see you doing a lot of how	I see you indulging excessively
16	ابتلعها افكارها	She was quite lost in thought	Her thoughts swallowed her	Her thoughts consumed her
17	خال المستمع انه يزفر قنات كبده	Expected pieces of flesh to come up	The listener feels that he is exhaling crumbs from his liver	The listener's uncle sighs, venting his frustration
18	اصوم وافطر على بصلة	Break a fast by eating an onion	I fast and break my fast with an onion	I fast and break my fast with an onion.
19	لك عيناى	I give my word	You have my eyes	You have my eyes
20	لن يلم الله شعثك برجل	God will never find you a husband	God will not blame your hairiness with a man	God will not comb your unkempt hair with someone else's leg
21	باب التجار مملع	It's always the carpenter's door that's falling apart	The carpenter's door is dislodged	The carpenter's door is unhinged
22	ستر مينى عند قدمه اسيرة لهواه	Throw down at his feet	You will throw me at his feet, captive to his desires	You will throw me when I stand at his feet, a captive to his love
23	ويقتلع قدميه من الأرض اقتلاعا	picking his feet up laboriously and deliberately as he	He uproots his feet from the ground	And he uproots his feet from the ground forcibly
24	سيبقى الكفن في حرز حريز حتى يقضى الله أمرا كان مفعولا	The shroud will stay in a safe place with me until God works His will.	The shroud will remain in Hariz's shelter until God decrees something that has already been done	The shroud will remain in its place until Allah fulfills a destined matter
25	كما رأيا نور الدنيا في بيت واحد	They had been born in the same house.	They also saw the light of the world in one house	As they saw the light of the world in one house.
26	أكل العيش بحب خفة اليد	"For a decent living you need a nice quick hand!	Eating to live loves sleight of hand	Earning a living requires skillful hands
27	وقبل الهواء قبلة ذات وسوسة	He kissed the air noisily.	And kiss the air with an obsessive kiss	Before the air, a hesitant kiss
28	اخلع رداء هذه الحياة القذرة الحقيرة	Shake off this miserable life,	Take off the robe of this dirty, contemptible life	Take off the cloak of this dirty and lowly life
29	الزواج كفيل بري العود الذابل	Marriage could certainly regenerate a faded figure, revitalize a listless body.	Marriage is the guarantor of the withering out	Marriage is capable of reviving the fading branch
30	وذكرت كيف تحلب ريق أهل الزقاق يوما على يوم	she recalled how all Midaq Alley was at one time wild for a bit of this food.	She mentioned how she milks the saliva of the people of the alley day after day	And I mentioned how the people of the alley used to milk the days day by day
31	أه يا بنت الثعبان	You serpent's child, you!	Oh, snake girl	Ah, you daughter of a snake
32	تلقي الحياة بوجه جديد، كما كانت الحياة تطالعها بوجه جديد كذلك	Saniya Afify was seeing the world in a new light, just as the world was seeing a new Mrs. Afify.	She saw life with a new face, just as life saw her with a new face as well	Life is seen in a new light, just as life looks at it in a new way as well
33	واليوم تطمئن جنوبنا	and today our hearts are put at rest.	Today, our south is at peace	And today, our south is reassured
34	ضاربا الأرض بقدميه	Stamping his foot	Hitting the ground with his feet	Striking the ground with his feet
35	لأول مرة رأى ما ينطق به وجهه	the first time noticed his friend's gloominess and worried expression	For the first time he saw what his face said	For the first time, he saw what his face was saying
36	إنك خروف، وحلال أن تنحر في عيد الأضحى	You're just a brainless sheep! You should be sacrificed at the feast of al-Adha.	You are a sheep, and it is permissible for you to slaughter it on Eid al-Adha	You are a sheep, and it is permissible to be slaughtered on Eid al-Adha
37	تنزع قلبها في صدرها	She is suffering	She pulls her heart out of her chest	She feels her heart in her chest
38	فهيئات أن تسترخي يدها القابضة على حبل الحياة	Sounds impossible to feel relaxed.	She can hardly relax her hand holding the rope of life	Rarely does she loosen her grip on the rope of life
39	هذا هو ما كان يجب أن تفعله يا رطل	that's what you should have done you fool!	This is what you should have done, LB	This is what you should have done, Ratl

VII. DISCUSSION

A. Human Translation of Cultural References

Professional human translation is the gold standard for conveying Arabic terms with cultural resonance and allegorical sense. For example, in example 1, the Arabic phrase "يهبط عليه ملاك النعاس" uses the metaphor of an angel descending to represent sleep overtaking someone. The human translator captures this metaphor beautifully with "Sleep's angel descends upon him." However, the machine translation loses the angel metaphor and just states, "A drowsy angel descends upon him", not conveying the richness of the original cultural imagery. These results go in line with the early work completed by Abdel-Hafiz (2003). In translating Mahfouz's novel *The Thief and the Dogs*, Abdel-Hafiz found numerous pragmatic and linguistic issues with the English translation that point to machines' difficulty in capturing metaphor, rhetoric, and cultural nuances. Abdel-Hafiz (2003) concludes, "Such translational problems may distort [Mahfouz's] works and reduce the enjoyment readers expect from them." This aligns with the conclusion of this study that human expertise is needed to convey the allegorical significance of Arabic proverbs. According to the analytical study by Muhmmmed (2022), human translators can provide high-quality translations of culture-bound expressions by drawing on their knowledge of the source and target cultures. When translating Ziqaq Al-Midaq by Najeeb Mahfouz, human translators could convey the meaning of culture-bound expressions. The human translation used appropriate translation procedures.

Similarly, in example 3, the Arabic phrase "أم حسيت أن السماء تمطر ذهبًا" uses the metaphor of the sky raining gold to represent sudden good luck. As noticed in the Table, the human translator excellently preserves this metaphor of gold rain with "Do not expect the money to rain from heaven." However, the machine translator does not capture the cultural nuance of gold rain and just states, "Or did you think that the sky was raining gold?". The results show clear differences in how the human and machine translations handle the cultural connotations in the allegorical proverbs. Similar to the findings of Muhammed (2022), the researchers found human translation to be the most accurate method for dealing with culture-specific idioms, proverbs, and references in the novel.

In example 4, the Arabic word "مقلب" has a nuance of something unexpected that overturns a situation. It often has a humorous or prank-like tone. With this in mind, the human translator can infer this cultural connotation and translate "مقلب" as "prank", capturing the playful, ironic tone. However, the machine translation just states, "A turn followed by another turn", which does not convey the metaphorical meaning or cultural connotation of something unexpected happening in a funny way.

This study has verified that human translation produces high-quality meaning. This finding is in accordance with findings reported by Alhamshary (2023). Human translation of literary works involves skilled translators making thoughtful choices to convey meaning, culture, and style from the source text. As Alhamshary (2023) found, human translators use various strategies like paraphrasing or cultural substitution to handle culturally bound terms and preserve meaning.

By the same token, in example 5, the Arabic text personifies time as a "master" or authority figure controlling people's lives - "المعاصر قد تكون أوقاتة سيده". The human translator captures this by describing time as a "master". However, the machine translation does not personify time in the same metaphorical manner, losing the cultural nuance of time's domination over people's destinies.

Even though this study did not replicate the previously reported by Ettobia (2014), the current paper's results showed how translators make diverse choices like omission, assimilation, or non-assimilation when rendering dialect and orality based on linguistic, aesthetic and ideological factors.

As seen in examples like example 8, the professional translator appropriately captures the metaphorical meaning of "clamours with a distinctive and personal life of its own". They are also able to skillfully translate rhetorical devices like the simile in example 16, "as though from heaven," while recalling the essence.

The human translations done by professionals demonstrate a deeper understanding of the cultural context and literary devices. In example 22, the translator conveys the emotive imagery of desperately pleading by saying, "Throw me down at his feet". The cultural inference of fasting customs is accurately captured in example 18's "Break a fast by eating an onion". Their expertise allows them to translate allegorical phrases smoothly, such as the 30's metaphorical idiom being rendered naturally as "milk the saliva".

Professional translators have a deep understanding of Arabic language and culture. Therefore, human translators with Arabic cultural backgrounds are able to accurately translate concepts like culturally-laden terms of endearment in example 6. Their familiarity with norms of Arabic expression helps them smoothly render proverbs into natural-sounding English without losing rhetorical metaphors. As seen in examples 20 and 21, their cultural grasp allows them to convey idioms around carpentry and marriage clearly. It is also worth mentioning that the result of any translated text also depends on the competency of the human translator. Therefore, results depend on the translator's competency in the languages and grasp of the cultures involved.

In the reverse direction of translating from English to Arabic, additional complexities arise around conveying rhetoric and allegorical meanings shaped by Arab cultures back into the source language. As Albir and Alves (2009) noted, translation requires linguistic and cultural-conceptual fluency to unlock intended meanings shaped by the source context fully. For example, in translating the sleep metaphor in Example 1 or the term of endearment in Example 6 back into

Arabic, simply rendering the surface meaning risks missing cultural implications that would resonate with an Arabic-speaking audience. The translator must decode possible symbolic religious connotations from imagery like "angel" or personal intimacy from affection idioms when reconstructing the phrases to resonate appropriately in Arabic (Aziz & Lataiwish, 2000).

Human translators are able to interpret the core meaning and cultural significance of allegorical phrases. For example, in example 28, the human translator conveys the sense of misery and contemptibility in "shake off this miserable life", whereas ChatGPT provides a more literal "take off the robe of this dirty, contemptible life." A similar conclusion was reached by Fatima and Neimneh (2014). They stated that human translators make efforts to retain cultural significance when translating metaphors. This kind of effort is the key to understanding literary elements like character development.

The analysis indicates that human translation excels at producing natural translations in the target language while conveying the original Arabic text's rhetorical techniques and cultural nuances. The precision and attention to detail exhibited in the human translations demonstrate the translators' strong command of the Arabic language and ability to localize the meaning aptly. This key finding aligns with previous literature such as Abdel-Hafiz (2003), Fatima and Neimneh (2014), Muhmmmed (2022), and Alhamshary (2023) which showed human translators' ability to effectively transfer meaning, rhetoric, and culture when translating from Arabic to English. The human experts' fluency in the target language allows them to produce translations faithful to the original works while also maintaining readability, rhetorical elements, and cultural resonances.

B. Translation of Cultural References by Google Translate

Although Google Translate is helpful for literal translations, it lacks the finesse of human experts in conveying allegorical phrases and idioms. Examples like example 10 show Google Translate renders a literal translation that fails to capture the rhetorical imagery. In example 19, it misses the cultural context around giving the word to someone as a promise by translating the Arabic word "عيناي" into "eyes". Translating idioms like example 21 generates unnatural phrasing like "the carpenter's door is unhinged".

Based on the previous examples, it can be understood that Google Translate provides adequate literal meaning but does not adequately express the allegorical sense or rhetorical metaphors. It also tends to falter when translating concepts steeped in Arabic culture, idioms, and stylistic expressions. Despite the fact that it is helpful for understanding, Google Translate cannot match humans in accurately conveying the richness of Arabic proverbs.

This result ties well with previous studies on human and machine translation. As an illustration, Mehawesh's (2023) comparative analysis of Palace Walk found that human translation could better translate emotive words, figures of speech, and cultural expressions. Mehawesh (2023, p. 15) states, "HT succeeded in achieving the functional equivalent, while MT semantic choices did not transfer this image to the readers." This corroborates the finding of this study that human translation better conveys rhetorical metaphors while machine translation remains limited to literal meaning.

However, in line with these ideas, the study by Muhmmmed (2022) also suggests that Google Translate is the least effective method for translating culture-bound expressions. However, Google Translate can provide fast, rough translations. This study and Muhmmmed note that Google often fails to find equivalent translations for proverbs and idioms.

As stated above, Google Translate provides adequate literal translations but often misses connotative meanings. We see this in example 22, where it states, "You will throw me when I stand at his feet." This translation does not fully convey the metaphorical desperation. Example 18, "أصوم وأفطر على بصل", is translated literally as "I fast and break my fast with an onion". This translation also fails to capture the cultural context. Google also falters with allegorical phrases like example 35's "For the first time, he saw what his face was saying", where it loses the personification meaning. When comparing this result to recently published work, it must be pointed out that Google Translate lacks the cultural context and background knowledge human translators possess. Muhmmmed (2020) and current work agree that in translating literature like Ziqaq Al-Midaq, the nuanced meaning of culture-bound language can be lost or distorted by Google Translate.

For instance, in example 1, "يهبط عليه ملاك النعاس", the human translator captures the laborious struggle meaning in "picking his feet up laboriously and deliberately", while Google states the more basic "He uproots his feet from the ground". Google Translate delivers a base literal sense but lacks the finesse to handle rhetorical devices, idioms, and cultural nuances. Mehawesh (2023) and Muhmmmed (2022) both emphasized a continued need for skilled human Arabic translators, especially for literary works, rather than relying only on Google Translate.

Additionally, Google Translate struggles to translate idiomatic phrases, often relying on word-for-word substitution rather than expressing the overall metaphorical meaning. In example 26, "أكل العيش يحب خفة اليد", the human translator interprets the allegory as "For a decent living you need a nice quick hand!" whereas Google renders it literally as "Eating to live loves sleight of hand." While technically accurate, Google misses the real significance. Similarly, for the expression in example 28, "الطلع رداء هذه الحياة القذرة الحقيرة", Google converts it directly as "Take off the robe of this dirty, contemptible life". However, the human translator interprets the deeper cultural context of "miserable" and "Shake off this miserable life".

Battah's (2023) study comparison of Google Translate and humans aligns with the study's conclusions on the deficiencies of machine translation for allegorical phrases. This piece of compelling evidence goes well with this

paper's finding that Google Translate is just a statistical machine translation system. It can provide rough translations that get across the general meaning by correlating source text phrases to target language corpora.

These basic findings are consistent with a recent study (Battah, 2023) showing that Google Translate often lacks fluency, accuracy, and cultural awareness when translating literary works. Google Translate frequently misses cultural references, idioms, and metaphors that are key to understanding the full meaning. The results may be awkward, ungrammatical or nonsensical. Extensive human post-editing is needed to fix errors and improve readability.

Google Translate does not adequately convey the rich implications of the allegorical proverbs. The researchers found that Google Translate tends to provide more literal word-for-word translations that do not convey the Arabic proverbs' full cultural meanings or allegorical significance. Its translations are accurate at a surface level but lack human translations' depth, nuance, and emotive sense.

As the examples illustrate above, Google Translate often provides literal translations that do not fully capture the original Arabic text's metaphorical, idiomatic, and cultural resonances. This aligns with Battah's (2023) comparative study, which found Google Translate insufficient for allegorical phrases, as it relies on statistical word correlations rather than real understanding. Similarly, Muhmmmed's (2022) study on translating culture-bound expressions concluded Google Translate was the least effective method. Google Translate often distorts or loses cultural meaning. While Google Translate can provide fast, rough translations, both studies agree it frequently struggles with rhetorical devices, idioms, and culture-specific concepts steeped in Arabic identity. The machine lacks the depth of knowledge and background context that human translators need to interpret allegorical language. As Muhmmmed (2022) emphasizes, there is still a need for qualified human Arabic translators for literary works rather than fully relying on Google Translate. The limitations are apparent in examples like "Shake off this miserable life", where Google provides a literal translation but misses the cultural implications interpreted by human experts.

As a statistical machine translation approach, Google Translate relies on mapping source text phrases to target language text corpora without deeper semantic analysis. This frequently leads to uneven literary translation quality as cultural allegories, idioms, euphemisms, and rhetorical devices can lack equivalent pattern matches (Costa-Juss et al., 2016). For example, in this study, Google Translate struggled with Arabic idioms like fasting customs in Example 18 and terms of endearment in Example 6. Statistical models also risk distorting meaning around sociocultural contexts, religious references, and political speech. Pandian and Kadhivelu (2012) found Google Translate inconsistent for Tamil literary works. The mistranslations require extensive human post-editing around culture-specific metaphors and emotive phrases.

C. Translation of Cultural References by ChatGPT

As shown in the literature review, ChatGPT is an artificial intelligence system designed by Anthropic to have natural language conversations. Although ChatGPT has a broad knowledge base, its ability to translate culture-bound Arabic expressions into English with the nuance of a human translator may be limited. According to Muhmmmed's (2022) study, the cultural and linguistic knowledge required to translate idioms and proverbs effectively presents difficulties for machine translation.

ChatGPT shows some improvements over Google Translate. ChatGPT is way better than Google Translate in capturing the essence of rhetorical devices like metaphors and similes. For instance, in example 1, it retains the metaphorical sense of "sleep's angel". Also, in example 14, it conveys the meaning of heavenly help. When translating the reference to "heavenly help" in Example 14 into Arabic for a Muslim reader, as explored by Aljabri (2021) in their study of literature translation, it requires reinterpreting the allegory through Islamic cultural knowledge frames rather than just literal meaning. Thus, conveying rhetoric tools and cultural conceptual depth in the reverse direction poses distinct challenges that demand drawing on translators' cultural fluency and background knowledge beyond what is required for Arabic to English direction. However, it is inconsistent, as we see in examples like example 5, where it loses the time metaphor. By comparing the results with Muhmmmed's (2022), ChatGPT could potentially describe its limitations in translating culture-specific content and provide transparent explanations of its translation choices. Compared to Google Translate, ChatGPT produces relatively smoother and more natural-sounding English renderings of certain proverbs like example 15 "اراك تكثر من الكيف" and example 21 "باب النجار مخلع". Nevertheless, it still misses cultural meanings like terms of endearment in example 6 "إنك من طينة أخرى يا محبوبتي". It also falters with Arabic idioms, as we see in example 18, "اصوم وافطر على بصللة", where it mistranslates fasting customs.

ChatGPT lacks the real-world knowledge and nuanced linguistic skills that human translators gain through training and experience. While it can produce readable translations, ChatGPT is limited in conveying the original text's cultural nuances, deeper meaning, and literary qualities. Its translations often lack the creativity, artistry, and attention to tone that characterizes quality human translation. This is consistent with what has been found in previous work (Elsheemi, 2014; Rabadi, 2012; Obeidat & Mahdi, 2019). Qualified literary translators are able to produce nuanced translations that communicate the essence of the literary work across languages. However, AI translation is fast, low-cost, and can translate large volumes of text. It is useful for simple content but cannot replace skilled human translators to produce high-quality literary translations.

ChatGPT shows promise in identifying rhetorical metaphors more robustly than Google Translate. However, it lacks human translators' depth of cultural and allegorical understanding to translate nuanced Arabic proverbs accurately. Like other AI, it cannot yet match professional human mastery.

The researchers noticed that ChatGPT renders quite smooth and readable translations, although some cultural meaning is lacking. In example 25, “كما رأيا نور الدنيا في بيت واحد”, the human translator captures the shared origins meaning in "They had been born in the same house" while ChatGPT states more plainly "As they saw the light of the world in one house".

In some cases, ChatGPT does come closer to the human meaning than Google Translate does. In example 24 “سيبقى الكفن في حرز حريز حتى يقضي الله أمرا كان مفعولا”, ChatGPT conveys the intended message of "The shroud will remain in its place until Allah fulfils a destined matter" compared to Google's more literal "The shroud will remain in Hariz's shelter until God decrees something that has already been done".

Recent advances in neural machine translation create capabilities for algorithms like ChatGPT to capture metaphorical sense better, as we saw in Example 1's “sleep's angel” compared to previous phrase-based statistical models. However, as noted across analyses of examples in this study, significant challenges remain around accurately conveying cultural nuances, allegorical speech, and rhetorical devices. For instance, the fasting customs references in Example 18 or the terms of endearment in Example 6 involve interpreting implicit cultural knowledge that poses difficulties even for AI systems (Chu & Wang, 2018). There are still limitations around conveying connotative significances shaped by the Arabic source contexts into accurate English translation.

Based on the preceding discussion for the three main translations, i.e., human, Google, and ChatGPT, the human translator is able to infer the cultural resonances and unspoken associations that give richer meaning to the allegorical proverbs and idioms. On the other hand, the machine translation interprets them more literally without capturing the connotative significance. Thus, this demonstrates that human translators still maintain an edge in identifying and conveying cultural nuances shaped by the source language and context. Expectedly, machine translation struggles to move beyond the literal meaning to metaphorical and symbolic levels of interpretation.

However, full automation remains unreliable for literary works with complex culture-bound meanings, as seen across examples in this study. Rivera-Trigueros (2022) found that even advanced models struggle with rhetorical devices, ambiguous words, and accurately reflecting implicit meanings without extensive human post-editing. Qualified human translators maintain unique value in providing quality translation, especially for conveying emotive sense, idioms, and cultural connotations, as consistently demonstrated across English renderings of Arabic terms and phrases in this analysis. The cultural grasp and interpretive skills to unravel rhetorical metaphors, social customs, and other nuanced implications seen in instances like “heavenly help” in Example 14 further underscore the continued need for human mastery.

Human translation remains the most accurate and nuanced approach for conveying Arabic proverbs' rich cultural resonances and allegorical meanings. AI-enhanced translation tools like Google Translate and ChatGPT have limitations in fully understanding rhetoric idioms and culture. Although these tools complement humans, they cannot replace their expertise in translating literary works.

The comparative analysis demonstrates that ChatGPT generates more fluent English renderings of Arabic cultural connotations than Google Translate. Furthermore, ChatGPT is limited to communicating elementary metaphorical meaning surrounding certain allegorical turns of phrase and idiomatic expressions. However, as supported across scholarly discourse on machine translation technologies, considerable gaps persist in contrast to human mastery for precisely conveying rhetorical devices and sociocultural conceptual significances shaped by the original Arabic linguistic frameworks. However, in line with previous studies like Muhammed (2022), ChatGPT still struggles with accurately capturing the cultural meaning and richer implications of Arabic allegorical phrases and idioms. Although it shows some improvements over Google Translate, ChatGPT lacks human experts' real-world knowledge, linguistic skills, creativity, and cultural awareness. Just as teachers and educationalists should seek new methods and techniques in teaching literature, translators and translation scholars must continue exploring innovative approaches to convey the richness of allegorical language and culture-bound rhetorical devices when rendering Arabic texts into English (Abushihab et al., 2023). As noted in examples like fasting customs or terms of endearment, ChatGPT fails to interpret cultural references and misses connotative meanings shaped by Arabic contexts. Although readable, its translations lack the depth, artistry, and attention to culturally specific tones achieved by qualified human literary translators. This was consistent with limitations found in studies by Elsheemi (2014), Rabadi (2012) and Obeidat and Mahdi (2019). The elaborate employment of metaphorical language and culturally-symbolic imagery by early Arabic literary critics to evaluate the aesthetic qualities of poetry reflects a broader tradition of allegorical resonance within Arabic expressive forms (Al Kaabi, 2020).

The researchers conclude that ChatGPT is useful in complementing human translation but still cannot attain the expertise of professionals in conveying allegorical phrases and idioms. More breakthroughs are needed in contextual AI to match human mastery of metaphorical, idiomatic and culture-bound Arabic text. Another point is often overlooked is the vague in translation. Vague translation creates uncertainty in interpreting intended meanings. Machine translation approaches demonstrate limitations in conveying sociocultural conceptual depths encoded in Arabic allegorical rhetoric during the translation process. Without human discernment of cultural nuances, computational models struggle to move beyond surface literal meanings to reflect connotative, symbolic significances that give life to Arabic literary works (Ismail et al., 2023).

VIII. CONCLUSION

This comparative corpus-based study of human versus AI-based machine translation aimed to shed light on the differences in conveying cultural references when translating cultural extracts with cultural connotations from the Arabic culture into English. The results revealed that human translation demonstrated greater accuracy and depth in conveying core cultural meanings shaped by Arabic cultural imagery and symbolism. The human translators were better able to capture culturally nuanced metaphors involving sleep, luck, time, and other abstract concepts. In contrast, machine translation often interpreted the terms with cultural connotations more literally, failing to transfer the allegorical significance. In addition, the results revealed that human translation proved superior in preserving cultural connotations tones. The human translation was able to create associations that enrich the meaning of proverbs. The most compelling note is that the human translations reflected sensitivity to the Arabic terms' humorous, ironic, and playful undertones. These features were lost in literal machine translations. The results also showed that ChatGPT performed Google Translate in rendering the cultural reference. This might be due to the fact that ChatGPT has a better understanding of the contextual clues that Google Translate.

IX. RECOMMENDATIONS

Based on the findings, certain recommendations can be made to enhance translation quality further and advance the field. Students in translation programs should receive training in AI translation tools and in-depth education on cultural meanings. This will equip the next generation of translators for computer-assisted human translation, combining technological productivity and human expertise. Additionally, AI researchers should increase collaboration with linguists, anthropologists, literary scholars, and cultural experts to identify challenges and opportunities for improving machine translation of allegorical, symbolic language steeped in cultural contexts. Professional translators can pragmatically employ AI tools for efficiency gains in their workflow but should diligently post-edit machine translations of literary works to fix inevitable errors and improve readability, rhetoric, and localization. More comparative corpus studies on human versus machine translation need to be conducted across languages, text genres, and time periods. Rigorous comparative analysis will reveal limitations of current AI technologies and corpus deficiencies while guiding progress in machine learning and knowledge representation for translation. With thoughtful integration of human expertise and AI capabilities, the field of translation can continue advancing, bringing people together across cultures.

X. LIMITATIONS AND FUTURE RESEARCH

Although the current study has contributed to the translation of literary works and provided insights into human and machine translations, some limitations are acknowledged. The study focused on one literary type and work, which limited the generalizability of the finding or other genres and similar works. Besides, the current study did not address the translation methods used by humans or machine translations. Accordingly, future studies may focus on other literary genres and include various literary works to make findings more generalizable. In addition, literary translation researchers need to focus on the strategies employed by human and machine translation when translating linguistic and cultural aspects of the source text.

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