

A Cogno-Prosodic Approach to Translating Arabic Poetry into English: Human vs. Machine

MOHAMMED FARGHAL *

Applied Science Private University, Jordan
m_farghal@asu.edu.jo

AHMAD S HAIDER

Applied Science Private University, Jordan

ABSTRACT

This study offers a schema-theoretic framework for comprehending the translation process of classical Arabic poetry into English, highlighting the significance of schematic ideation in the target text and schematic comprehension in the source text. Four categories of schemata are distinguished in this model: culture-free, culture-bound, culture-sensitive, and language-bound. These four schematic categories are used to evaluate human, ChatGPT, and Gemini translations of a poetic corpus consisting of six individual verses and six stanzas. The findings show that the three translators perform very well in rendering thematic elements that feature culture-free and culture-bound schemata. However, ChatGPT and Gemini lag seriously behind human translation when handling culture-bound and culture-sensitive schemata, especially when they feature allusions to proper nouns, which causes them to offer incomprehensible translations. In terms of prosody, humans and ChatGPT lead the way, with Gemini falling behind by a small margin, especially when aligning thematic elements with prosodic features in culture-free and culture-bound schemata. In fact, the two AI systems present themselves as strong competitors to human translation in this regard. The conclusion emphasises the necessity of human expertise in capturing cultural nuances in poetic texts, as well as stressing the clear and valuable advantages of using AI-based systems in translating poetry while referring to some weaknesses.

Keywords: Poetry Translation; Schema Theory; Cogno-Prosodic Approach; Human Translation; AI-Powered Translation

INTRODUCTION

Poetry translation has long been a mainstay of literary and translation studies, with its own difficulties resulting from the interaction of language, cultural, and artistic factors (Lahiani, 2020). Poetry, in contrast to other forms, is a complex combination of form and content, with rhythm, rhyme, and structure playing an equally important role in meaning as lexical and thematic components (Tsur & Gafni, 2022). Because of its intricacy, translation requires a careful approach that strikes a balance between the target audience's linguistic and cultural sensibilities and faithfulness to the original text (Alowedhi & Al-Ahdal, 2023).

Using schema theory, a cogno-prosodic method to translate Arabic poetry investigates how human and machine translators decode and re-encode poetic texts. This method takes into account how translators understand and create translations by using their schemata, which are cognitive frameworks influenced by past knowledge and cultural background. The dynamic interplay between schemata and the distinctive formal components of poetry results in a multi-layered translation process that presents difficulties in attaining consistency and cohesiveness.

The translation of literary texts has seen tremendous breakthroughs and new difficulties since the introduction of machine translation tools (Hamat, 2024). Though they are excellent at grammatical and syntactic coherence, machines may fail to capture the complex interaction of prosodic and cultural factors that are crucial to poetry (Gao et al., 2024). This study examines the cogno-prosodic dynamics in translating Arabic poetry by contrasting machine translation systems with human translation processes. It advances our knowledge of the interaction between cognitive, cultural, and prosodic aspects in poetic translation by examining how prosodic elements, cultural sensitivity, and schema activation affect translations' faithfulness and artistic resonance.

This study attempts to answer the following research questions:

RQ1: How does the aesthetic component of Arabic poetry—such as meter and rhyme—affect the fidelity of translations by humans versus machines?

RQ2: How do different types of schemata (culture-free, culture-bound, culture-sensitive, and language-bound) influence the processes of text comprehension and ideation in the translation of Arabic poetry?

LITERATURE REVIEW

THEORETICAL BACKGROUND

Literary translation, of which poetry translation is a subset, was and remains a cornerstone of translation history, even in light of the recent enormous strides achieved by translation studies to expand the scope of translation activity to embrace a wide variety of text kinds or genres (Munday et al., 2022). In fact, the recent rise of Translation Studies as a subfield of Applied Linguistics simply serves as a strong competitor—not a substitute—for the conventional view that translation is integral to Literary Criticism and Comparative Literature. Literary translation is considered to be an important genre in translation and a reputable symbol of translation studies without taking sides.

Unlike other genres where the form may be neutralised to varied degrees, literary translation has a unique standing because it symbolises the best possible use of language, where form and content become intertwined. Literary texts in general and poetry in particular, therefore, assume a sort of aesthetically-oriented discourse in which the author actually communicates to the reader both its thematic and formal elements (i.e., the linguistic code) (Burkhanov, 2003).

Since poetry writings, in particular, have this innate quality, Adams (1973, p. 10) came to the conclusion that "... all the choices open to (the translator) are in various ways and for various reasons impossible. The choice is simply between different ways of murdering the original". The current state of the art is not as dire as Adams implies. The formal density of literary texts and their capacity to convey a wide range of concepts, emotions, and perceptions will, nevertheless, continue to be a formidable obstacle in literary translation (Gutt, 1996).

In order to create pathways that will result in feasible translations, this introduction contends that the translator and the literary text must develop a schematic rapport in terms of both content and formal schemata (Farghal, 1999; Farghal & Al-Masri, 2000). Regarding this, Pajares and Romero (1997, p. 291) argue, "The literary text activates in the reader a series of mechanisms which allow him to recreate the world which is presented before his/her eyes. In this way, the work of art arises from the convergence between text and reader". Since poetry translation is more

structurally confined than other literary genres, the developing schematic rapport between text and reader is divided into feeding and interactive components for both theoretical and practical reasons.

Figure 1 shows a diagrammatic representation of a schema-theoretic model of translating poetry. According to the model below (Figure 1), translating poetry involves both text comprehension in SL and text ideation in TL, both of which need schematic activity. Translation is seen to be a matter of interpretative resemblance rather than translation equivalency (Gutt, 1996). Culture-free, culture-bound, culture-sensitive, and language-bound schemata are the four types of schemata with which these processes interact most effectively. As a result of this interaction, a Target Language Text (TLT) is encoded. Coherence, which exists in the reader's mind, and cohesion, which exists within the text, can be used to assess the textuality of the TLT (i.e., the result of translation activity).

This allows a translation to be either fully cohesive and/or coherent, moderately cohesive and/or coherent, or substantially incohesive and/or incoherent. Notably, text coherence may exhibit comparable behaviour across all text kinds, perhaps to a greater extent in poetry, where form and content are interwoven to create meaning. Poetry's aesthetic elements of language density, rhyme, and meter serve as important cohesion types in poetic discourse because cohesion in poetry frequently differs significantly from cohesion in other texts, including other literary genres (Halliday & Hasan, 2014).

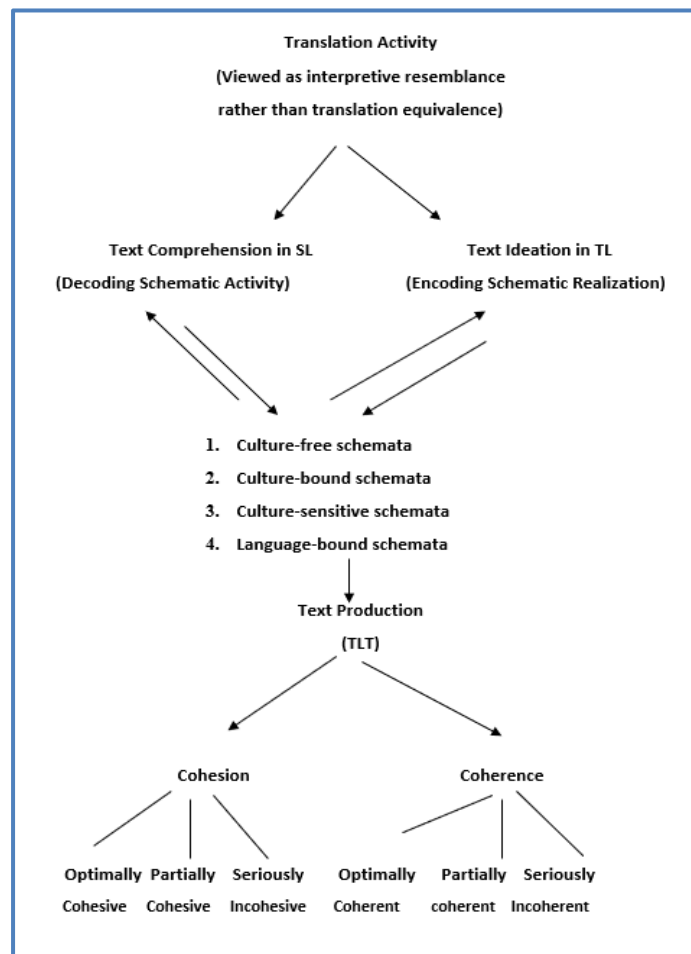


FIGURE 1. A diagrammatic representation of a schema-theoretic model of translating poetry (Farghal, 2023)

EMPIRICAL STUDIES

Poetry translation has drawn the interest of numerous scholars (Botirova & Sobirova, 2019; Dastjerdi et al., 2008; Munday & Blakesley, 2016; Niknasab & Pishbin, 2011; Pallavi & Mojibur, 2018; Welch, 1972). According to Lahiani (2022), poetry highlights semantic overtones by employing linguistic methods like phonological, grammatical, or lexical devices. These linguistic traits are contradictory limitations that are frequently broken during translation. In order to maximise the transfer of meaning and style, it is necessary to adhere to the hierarchy of this infraction, even though it is unavoidable. It became clear via the analysis of Arabic poetry and translations that linguistic and cultural variations, as well as the importance of limits in each language, always lead to loss. Nevertheless, such loss is minimised by applying optimisation theory correctly. Similarly, Lahiani et al. (2023) looked into the acceptability and use of hermeneutic procedures in poetry translation. The findings demonstrated that literary translation can adhere to either creative hermeneutic reformulations or literal, paraphrasing imagery. Creative hermeneutic reformulations entail examining the text's meaning and determining its source, including its stylistic elements and word choice. This enhances the translated product's quality as a reflection of the original text and as a stand-alone poetic creation.

Farghal (2023) suggested four categories of cognitive structures in poetry translation: culture-free, culture-bound, culture-sensitive, and language-bound. These categories are based on cognitive comprehension of a source poetic text and developing cognitive ideation in TL. He illustrates how the degree of coherence and lyrical cohesiveness of the translation is determined by the dynamic interaction and successful fit between cognitive comprehension in SL and cognitive ideation in TL through the analysis of stanzas from Classical Arabic poetry. Therefore, a poetry translation can be minimally cohesive or coherent or optimally cohesive or coherent. While poetic cohesiveness aims to express formal qualities in terms of metaphor and prosody, coherence is intended to capture content in terms of thematic clarity.

When translating Arabic research titles into English for the humanities and social sciences, Al-Salman and Haider (2024) evaluated the precision of popular machine translation (MT) and artificial intelligence (AI) platforms like Google Translate, ChatGPT, and Gemini. The findings showed that the use of the three tools resulted in different errors in meaning or sentence structure. Notably, human translations had the most correct vocabulary despite some grammatical errors. The results also showed that Gemini produced the fewest errors out of the three systems. Similarly, Alowedi and Al-Ahdal (2023) compared the translations of poetry by humans and AI machines. The outcomes demonstrated that neither artistic elements nor sociocultural subtleties were adequately captured by the machine translations. This highlights the artistic ability required for performing poetry.

In the same vein, Farghal and Haider (2024) compared the English translations of 15 separate Classical Arabic verses produced by a human translator with two large language models (LLMs), namely Google's Gemini (GEM) and OpenAI's ChatGPT (GPT). Fifty-four Arabic academics evaluated the translations according to three criteria: prosody, thematic clarity, and inventiveness. The results demonstrate that while participants' evaluations of GPT and human translations are unquestionably favourable in all three categories, GEM performs noticeably worse in terms of prosody. The study concluded that artificial intelligence (AI) technology is a serious rival to human translators and that more research is necessary to fully explore their interactive potential in translating poetry.

METHODOLOGY

To examine the cognitive processes involved in understanding and translating Arabic classical poetry, this study uses schema theory as a framework. The method focuses on how schemata, which are mental models that reflect past information and cultural background, influence both human and automated translators in understanding and reinterpreting poetic texts. These schemata, which are divided into four categories - culture-free, culture-bound, culture-sensitive, and language-bound - help analyse the processes of understanding and ideation vis-à-vis a translation product.

CORPUS OF STUDY

Six individual verses and six stanzas from classical Arabic poetry make up the corpus of this study, which were chosen for their cultural value, subject depth, grammatical complexity, and schematic diversity. Each verse/stanza was initially translated literally to create a point of reference, with the goal of retaining semantic information but excluding poetical components like rhyme and rhythm. The poetic texts are translated by GEM and GPT, which are instructed to render each verse (two hemistichs) into an AA-rhymed English couplet. Then, the automated translations are critically analysed and compared with the human translations of the same texts in Farghal (2023). The translator is a highly experienced translator with a profound expertise in literary translation. He is also a distinguished linguist, bringing a unique sensitivity to language that enriches his translations.

TABLE 1. Verses' Literal Translation

No.	Source Text	Target Text
1	مَا كُلُّ مَا يَتَمَنَّى الْمَرْءُ يُذْرِكُهُ تَجْرِي الرِّيحُ بِمَا لَا تَشْتَهِي السَّفِينُ	Not everything a person wishes for is attained The winds blow in ways ships do not desire
2	لِكُلِّ شَيْءٍ إِذَا مَا تَمَّ نَقْصَانُ فَلَا يُغْنِ بِطَيْبِ الْعَيْشِ إِنْسَانُ الْعِلْمُ صَيْدٌ وَالْكِتَابَةُ قَيْدٌ	Everything, when perfected, starts to decline So no person should be deceived by good livelihood Knowledge is prey and writing is its shackle
3	قَيْدِ صَبُودِكَ بِالْحَبَالِ الْوَائِقَةِ فَمِنْ الْحَمَاقَةِ أَنْ تُصِيدَ غَزَالَةً وَتُرْدهَا بَيْنَ الْخَلَائِقِ طَالِقَةً	So tie your prey with strong ropes For it is foolishness to hunt a gazelle And return it to nature, all free
4	رَأَيْتُ الْمَنَائِمَا خَبِطَ عَشْوَاءَ مَنْ تُصِيبُ تُؤْمِتُهُ وَمَنْ تُحْطِي يُعَمَّرُ فَيَهْرَمُ	I have seen fates striking randomly like a blind camel Whoever they hit dies, and whoever they miss lives long
5	عُيُونُ الْمَهَا بَيْنَ الرُّصَافَةِ وَالْجَسْرِ جَلْبِينُ الْهَوَى مِنْ حَيْثُ أَدْرِي وَلَا أَدْرِي دَعِ الْمَسَاجِدَ لِلْعِبَادِ تَسْكُنَهَا	The eyes of oryx between <i>Rusafa</i> and <i>Bridge</i> (two areas in Baghdad) Bring love from where I know and not know Leave the mosques for worshippers to inhabit
6	وَطَفَ بِنَا حَوْلَ حَمَّارٍ لَيْسَ قِينَا مَا قَالَ رَبُّكَ وَيْلٌ لِلَّذِينَ سَكَرُوا وَلَكِنَّه قَالَ وَيْلٌ لِلْمُصَلِّينَا	And let us go in search of a tavern to drink Your Lord did not say Woe to drunkards But he said Woe to praying people
7	قُلْ لِلْمَلْبِجَةِ بِالْخِمَارِ الْأَسْوَدِ مَاذَا فَعَلْتَ بِنَاسِكَ مُتَعَبِدِ قَدْ كَانَ شَمْرٌ لِلصَّلَاةِ ثِيَابِهِ حَتَّى قَعَدْتَ لَهُ بَبَابَ الْمَسْجِدِ رَدِي عَلَيْهِ صَلَاتِهِ وَصِيَامِهِ لَا تُقْتَلِيهِ بِحَقِّ دِينِ مُحَمَّدِ	Tell the beauty in the black veil What did she do to a devout ascetic He rolled up his clothes for prayer Until you sit for him at the mosque's door Give him back his prayer and fasting Don't kill him for Muhammad's religion's sake
8	الْأُمُّ مَدْرَسَةٌ إِذَا أَعَدَّتْهَا أَعَدَّتْ شَعْبًا طَيِّبَ الْأَعْرَاقِ الْأُمُّ رَوْضٌ إِنْ تَعْمَدَهُ الْحَيَا بِالرِّيِّ أَوْزَقُ أَيَّمَا إِبْرَاقِ الْأُمُّ أَسْتَاذُ الْأَسَاتِذَةِ الْأَلَى شَغَلَتْ مَأْتَرَهُمْ مَدَى الْأَفَاقِ	The mother is a school if you prepare her You have prepared a people of good lineage The mother is a garden if watered well She will blossom most abundantly The mother is the teacher of all teachers Whose deeds preoccupied far wide

9	هَلْ فِي لَيْلِي خِيَالُ النَّدَامِي وَالنَّوَاسِي عَانِقِ الْخِيَامَا وَتَسَاقُوا مِنْ خَاطِرِي الْأَحْلَامَا وَأَحْبُوا وَأَسْكُرُوا الْأَيَامَا	Images of my drinking companions appeared at night And <i>Abu Nawwas</i> embraced <i>Al-Khayam</i> (An Arab and Persian poet) And dreams flowed from my mind And they loved and intoxicated the days
10	تَدَاوَيْتَ مِنْ لَيْلَى بَلِيلَى مِنَ الْهَوَى كَمَا يَتَدَاوَى شَارِبُ الْخَمْرِ بِالْخَمْرِ	I was treated from Layla with Layla from love As a wine drinker is treated with wine
11	لَكَ يَا مَنَازِلَ فِي الْقُلُوبِ مَنَازِلُ أَقْفَرْتَ أَنْتَ وَهَنْ مَنَّا أَوْاهِلُ	To you, o homes in the hearts you dwell You are deserted, but you are still in them
12	رَأَيْتَ النَّاسَ قَدْ ذَهَبُوا إِلَى مَنْ عِنْدَهُ ذَهَبٌ وَمَنْ لَا عِنْدَهُ ذَهَبٌ فَعَنَهُ النَّاسَ قَدْ ذَهَبُوا	I saw people have gone To those who have gold And those who do not have gold From them, the people have gone away

ANALYSIS AND FINDINGS

As seen in the above model (Figure 1), the interplay between text ideation and understanding on the one hand and the four species of prospective schemata on the other constitutes the primary activity in poetry translation. While keeping in mind that these schemata species may co-occur, the following pages provide insight into the nature of these schemata. This helps to highlight elements like rhyme, meter, metaphor, parallelism, and wordplay that might not otherwise be as important or relevant in other discourse genres.

CULTURE-FREE SCHEMATA

The cognitive structures dubbed ‘culture-free schemata’ are those whose theme components can be deduced from universal principles derived from the broader human experience. In other words, if all other factors remain constant, the message or import contained in the culture-free schema will be easily translated and, consequently, understood by people from any human society. This idea is demonstrated by translating two self-contained verses from two well-known medieval Arab poets, Abu Al-Tayyib Al-Mutanabbi (915-965 CE/Table 2) and Abu Al-Baqa Al-Rundi (1204-1285 CE/Table 3), respectively, into English rhymed couplets below. As examples of wisdom, educated Arabs frequently quote such words.

TABLE 2. Human and AI renditions of verse 1

Human	ChatGPT	Gemini
You cannot obtain all that you crave; For winds may blow a ship to its grave;	Not all a man desires comes to be, For winds may blow against the sailor's plea.	Not all that a man wishes, he attains, The winds blow where the ships disdain.

TABLE 3. Human and AI renditions to verse 2

Human	ChatGPT	Gemini
Decline begins once perfection obtains; Pride yourself not on luxury gains.	All things, when perfected, must decline, Let no man be deceived by life's design.	All things must fade, all joys decay, Let not man be fooled by fortune's sway.

In terms of layout, the single Arabic verse is presented horizontally the way it was originally in Arabic, with an observable space separating the hemistichs as done above. However, for convenience, each hemistich is presented on a separate line in the forthcoming poetic texts, similar to the English translation, which is a rhymed couplet reflecting the thematic element of the verse.

The English translations in Table 2 and Table 3 are presumed to be easily understood by a literate native English speaker (or any literate recipient with sufficient English proficiency) of average intelligence. To explain, in Table 2, both the human translation and automated translations reflect the culture-free schema that a person cannot accomplish all they want, and ships cannot secure the amiability of winds all the time. Similarly, the translations in Table 2 reflect the general theme that when perfection is attained in any state of affairs, a stage of decline may follow, to which nobody is immune, so a person needs to keep their expectations within reasonable measures. These two culture-free schemata can arguably be appreciated by members of all human cultures. Note, for example, that the three translations in Table 1 have maintained the comparison of the wish-accomplishment relation with the ship-wind relation to capturing the culture-free schema, though employing different vocabulary, viz. obtain vs. come, to be vs. attain, and crave vs. desire vs. wish. While this lexical variation is possible, preserving the keywords is necessary, viz., the keyword *wind* is used in the three of them and *ship* in the first and third translations and contextually replaced with ‘the sailor’s plea’ in the second. Relying on universal principles directly enables the ability to grasp culture-free schemata inherent to the human experience.

Additionally, the target reader is supposed to value the translation's artistic components, which are reflected in rhyme, meter, and parallelism—all of which contribute to the texts' poetic density. In this regard, the human translation and GPT's translation prosodically fare better than GEM's translation because rhyme is improvised by the former, viz. *crave/grave* and *be/plea*, respectively, while it is missed by the latter, viz. *attains/disdain*. Based on our approach, while the first two translations are optimally coherent and cohesive, the third is optimally coherent but has a deficit in poetic cohesiveness because rhyme is missed in its couplet, which affects its prosodic rather than its thematic make-up.

The following English prose versions of the texts in Table 2 and Table 3 demonstrate a glaring lack of poetic cohesiveness:

- Not everything that one desires can be achieved;
Winds often blow against the want of ships.
- Decline of a thing begins once perfection arrives;
Never pride yourself on luxury livelihood.

Although the density and parallelism are preserved in the two prose translations above, the final word's syllable structure and rhyme—two important components of poetic cohesiveness—are destroyed. It should be mentioned that these prose or quasi-poetic versions, albeit seriously less prosodic, are successful in communicating the culture-free schemata in the Arabic verses above, just like the poetic versions that came before them. Therefore, the deficiency results from the inability to convey certain formal aspects of poetry, namely poetic cohesiveness.

The ability to phrase out poetic texts variously while maintaining their thematic elements, thanks to the variability of form and the constancy of content in discourse, makes it possible to offer different versions of the same text, especially if the text features culture-free schemata. Thus, both the diction, which represents the content, and the formal features, such as meter and rhyme,

which stand for prosody, can be equally manipulated in the TL. Table 4 below presents four human, poetic translations of an Arabic stanza, while Table 5 displays GPT and Gem’s renditions of the same stanza.

TABLE 4. Human renditions to stanza 1

Source	No.	Human
العلم صيدٌ والكتابة قيدهُ قيّد صيودك بالحبال الوثيقة فمِنَ الحماقة أن تصيدَ غزاله وتردها بينَ الخلائق طالقهُ	1	Knowledge is a hunt and writing its chain; Never let talk fly away after so much pain. Stupid is it to capture a gazelle as a gain; And alone let it go free without a rein.
	2	To hunt knowledge, writing is the key; That's where it can securely rest and be. Thoughtless is to catch a deer and set free; As much as engineering ideas but to flee.
	3	Knowledge is a hunt, writing its way; Never try to free even for one day. Tactless will it be to sit there and say; Alas! My deer has long gone away.
	4	Learning is a hunt, a blessing to keep; The pen after word will make you reap; Set it not free to wander and leap; The way an idea foolishly put to sleep.

TABLE 5. AI renditions to stanza 1

العلم صيدٌ والكتابة قيدهُ قيّد صيودك بالحبال الوثيقة فمِنَ الحماقة أن تصيدَ غزاله وتردها بينَ الخلائق طالقهُ	
ChatGPT	Gemini
Knowledge is a prey, and writing its snare, Bind your catch with ropes secure and rare. For folly it is to catch a graceful doe, Then set it loose for all to know.	Knowledge is a hunt, and writing is its tether, Bind your catch with strong and sturdy fetters. It's folly to capture a graceful gazelle, Then let it roam free among the people.

The underlying motif of this poetic piece—roughly paraphrased as *"Thoughts can be ephemeral unless documented in writing"*—is readily discernible in both the human and automated translations presented in Tables 4 and 5. As seen in Table 4, all four English translations successfully convey this theme, despite notable differences in diction, metaphor, and prosody. While a reader comparing these translations with the original Arabic stanza may express preferences, each version effectively preserves the thematic and prosodic elements. This demonstrates that poetry translation allows for diverse approaches to diction, metaphor, and rhythm, as form can be adapted while the core theme remains intact. For example, the extended hunt-knowledge metaphor is consistently maintained across all translations, even though some versions may align more closely with the original. In the fourth translation, this central metaphor is partially replaced with a pen-word metaphor. However, it still captures the essence of the stanza, illustrating how culture-free schemata and flexible poetic form enable effective variation in translation.

The two automated translations in Table 5, for their part, have also captured the culture-free schemata in the Arabic stanza. Both have successfully maintained the extended *hunt-gazelle-knowledge metaphor*, employing a lexical network that features items like *knowledge, prey, hunt, gazelle, doe, catch, snare, ropes, loose, free*, etc., to weave an image that communicates the motif.

However, while GPT succeeds in working out rhymed couplets that end with words exhibiting similar syllable structure, viz. *snare/rare* and *doe/know*, GEM has failed to improvise these prosodic features, viz. *tether/fetters* and *gazelle/people*. Apparently, GPT is more technically equipped to handle prosodic features in poetry translation than GEM, which still struggles with prosody. In fact, GPT presents itself as a strong competitor of the human translator in this regard. However, while the human translator is usually at pains to secure a match between content and prosody by exploring several lexical avenues, the machine can do this in a couple of seconds, thus saving time and effort.

One can even change the instructions given to the AI translator to produce a different poetic meter and can also ask the system to improve the output based on certain instructions. Below are two GPT versions of the above Arabic stanzas. The first is the output of instructing the system to give an AABA poetic meter, while the second instructs it to give a more faithful version.

- Knowledge is a hunt, and writing's the snare,
- Bind your catch with ropes that are strong and fair,
- For to chase a doe and let her roam free,
- Is to squander the wisdom beyond compare.
- Knowledge is a hunt, and writing's the chain,
- Bind your prey with ropes that will never wane,
- For it's foolish to catch a doe, then let go,
- And set her loose among the crowds again.

As can be observed, GPT has readily changed the English translation's poetic meter from an AABB pattern into an AABA pattern while maintaining the thematic elements embodied in the culture-free schemata. It has also succeeded in offering a more faithful version by using more literally corresponding lexical items, for example, *chain* instead of *snare* and *foolish* instead of *squander the wisdom*. In fact, the interactivity of such AI systems enables one to get multiple versions of the same piece. What the system does is just vary the poetic form while trying to preserve the content. Such tasks would be challenging and very time-consuming for the human translator.

CULTURE-BOUND SCHEMATA

Cognitive structures labelled 'culture-bound schemata' are those that are either entirely absent or just partially present in one culture. Generally speaking, translation techniques like definition, substitution, and lexical creation are frequently required due to this schematic mismatch (Farghal, 2004). In poetry translation, some schemata may exist that need to be changed/modified from culture-bound to either culture-free or culture-sensitive schemata for the sake of ensuring comprehensibility and naturalness in the TL. Below are two Arabic verses that illustrate this point, along with their translations (Tables 6 and 7).

TABLE 6. Human and AI renditions to verse 3

رَأَيْتُ الْمَنَائِمَا خَبِطَ عَشْوَاءَ مَنْ نُصِبَ تَمَّتْهُ وَمَنْ تُخَطِي يُعْمَرُ فِيهِمْ		
Human	ChatGPT	Gemini
At random have I witnessed fatalities strike with rage; The ones hit crumble, the ones missed prolong in age.	I saw death strike like a blind beast's sway, It takes its mark, while others delay.	I've seen Death strike randomly, whomever it meets, Killing some, while others live on till they're old and decrepit.

TABLE 7. Human and AI renditions to verse 4

غَيْرُونَ الْمَهَابِينَ الرُّصَافَةَ وَالْجَبْرَ جَلْبِينَ الْهَوَى مِنْ خَيْثُ أَدْرِي وَلَا أَدْرِي		
Human	ChatGPT	Gemini
Oryx eyes between Euphrates and Tigris roam; Arousing subconscious love in this new home.	The gazelle-like eyes by Rusafa and the bridge, Brought love to me, both known and unbidden ridge.	Gazelle-eyed charmers, 'neath Rsafa's sky, Ignite love's flame, I know not how or why.

Both verses in tables 6 and 7 have culture-bound schemata. The verse in Table 6 uses a culture-bound creative metaphor comparing the haphazardness of fatalities to the treading of a blind camel that randomly bumps into whatever comes in its way. While it is possible to foreignise (Venuti, 2017) the culture-bound schema in the English translation, the domestication of the metaphor into a culture-free schema may be deemed advisable by some translators to better serve the target reader's need in terms of universality and naturalness. As can be seen, the human translator and GEM have followed this option, i.e. changing the culture-bound *death-blind camel* metaphor into a culture-free metaphor, i.e. *death-randomness*, thus rendering the theme more transparent. However, while the human translator succeeds in producing a rhymed couplet with an AA pattern attending to syllable structure and rhyme (rage/age), GEM falters in this regard (meets/decrepit). GPT, in its turn, has only modified the *blind camel* metaphor to a *blind beast* metaphor, thus preserving an Arabic nuance while maintaining prosodic features.

In contrast to the human translation in Table 6, some translators may prioritise a faithful rendering of the Arabic creative metaphor, even if it is unfamiliar to other cultures. This preference becomes evident when comparing the translation of the verse above with the one below.

Death, a blind camel, roams the soul's domain;
 Randomly, it strikes, bestowing either life or pain.

The verse in Table 7, for its turn, has a culture-bound schema embodied in reference to locations that may be alien to most non-Arabic speakers, i.e., it refers to two areas in Baghdad, the Iraqi capital. The transliteration of the two names in English translation (unlike the culture-bound schema above) may destroy the poetics of the rendition because of its lack of comprehensibility and naturalness. The human translator, therefore, has replaced the two locations with the historically and universally familiar rivers Euphrates and Tigris, which flow through the Iraqi capital, thus adding an aesthetic and universal touch to the verse. Compare the first hard-going translation with the second smooth translation below (The former would not make much sense without providing a footnote):

- Oryx eyes between al-Rasafati and al-Jisri roam;
Arousing subconscious love in this new home.
- Oryx eyes between Euphrates and Tigris roam;
Arousing subconscious love in this new home.

By contrast, both GPT and GEM have struggled with the culture-bound schema in Table 7. The former has transliterated the first location into *Rusafa* and the second as *the bridge*, which renders the verse incomprehensible. Similarly, the latter has mis-transliterated the first location into *Rsafa* and omitted the second location, thus offering an incomprehensible translation, just like GPT's. Apparently, proper nouns that lack universal familiarity in poetry translation pose formidable problems to AI systems, unlike human translators who can coherently reinterpret or replace such items.

In some cases, a culture-bound schema may be universalised, i.e., changed into a culture-free schema in translation, while it may be preserved in other cases. Observe how the reference to 'the mosque' is generalised in Abu Nawabs' (714-783 CE) blasphemous text (Table 8) by the human translator, but it is preserved by GPT and GEM. Likewise, the *mosque* schema in Al-Miskeen al-Darami's (708-789 CE) text (Table 9) is preserved by the human translator and GPT but universalised by GEM.

TABLE 8. Human and AI renditions to stanza 2

دع المساجد للعباد تسكنها وطف بنا حول خمار لئيسقينا ما قال ربك ويل للذين سكروا ولكنه قال ويل للمصلين		
Human	ChatGPT	Gemini
Let temples be homes for worshippers to think; But let us go around in search of a tavern to drink. The Lord did not say "Woe to drinkers in excess"; Yet, he truly warned, "Woe to prayers in distress".	Leave the mosques for the devout to reside, Let us roam where the tavern flows abide. Your Lord condemned not those who drank with cheer, But warned of prayers devoid of sincere fear.	Leave the mosques, let worshippers reside, Gather 'round the wine, let's turn aside. God didn't say, "Beware the drunken soul," But warned the pious, lost their rightful role.

TABLE 9. Human and AI renditions to stanza 3

قل للمليحة بالخمير الأسود ماذا فعلت بناسك متعبد قد كان شمر للصلاة ثيابه حتى قعدت له بباب المسجد ردي عليه صلاته وصيامه لا تقتليه بحق دين محمد		
Human	ChatGPT	Gemini
Ask the gorgeous with the black, beautiful veil; What have you done to a devout, worshipping male? Who was ritually prepared for his prayers to sail; When you appeared before the mosque as a gale. Lo! Give him back his prayers and his fast; Don't kill him for Mohamet's faith and past.	Tell the fair one in the black veil, What have you done to a devout soul frail? He'd girded his robe for prayer divine, Till you lured him by the mosque's shrine. Return his prayers, his fasting too, Spare him, by the faith of Muhammad true.	O veiled beauty, dark-eyed, fair, A pious man, your victim, unaware. He raised his robes, prepared to pray, But your allure stole him away. A solemn sight, a tragic scene, Don't let his faith be lost, unseen.

On the one hand, the *mosque* schema in Table 8 has been generalised to a *temple* schema by the human translator but preserved by GPT and GEM while maintaining a universal blasphemous interpretation in the three translations. Thus, the *mosque* culture-bound schema, being universally familiar, may be coherently generalised or maintained in poetry translation. On the other hand, it would be incoherent to generalise the *mosque* schema to a *temple* schema in stanza 3 (Table 9) in the context of mentioning Prophet Mohammad. Hence, the mildly blasphemous religious schema featuring *the mosque* and *Prophet Mohammad* has been preserved in reference to the Muslim faith by both the human translator and GPT. By contrast, GEM's rendition has generalised the *mosque* schema by making it pertain to a universal religious scenario rather than specifically a Muslim scenario, which entails the omission of the reference to Prophet Mohammad.

In terms of prosodic features, the three translations in Table 9 have succeeded in producing the stanza in rhymed couplets. But again, the human translator and GPT prove to be more sensitive to rhyme being embodied in congruent syllable structure, viz. human translator's *veil/male, sail/gale, fast/past* and GPT's *veil/frail, divine/shrine, too/true* vs. GEM's *fair/unaware, pray/away, scene/unseen*.

CULTURE-SENSITIVE SCHEMATA

The difference between culture-sensitive and culture-bound schemata is that the former demonstrates pertinence rather than uniqueness to the SL culture. In the context of translation, this distinction is important because, in contrast to culture-bound schemata, which usually call for coherent reinterpretation, culture-sensitive schemata require literal translation as a typical translation strategy. The message or import must be captured through literal translation while maintaining SL idioms that use regional allusions or figures of speech. These local allusions typically result in new semantic relationships created by the poet, which can be approved and appreciated by the target reader in translation. The translator, therefore, does well by transferring these creative paradigms and/or syntagms into the TL, an act that most likely contributes to the enrichment of the TL's aesthetics and semantics. Below is a stanza from the Egyptian poet Hafiz Ibrahim (1871-1932 CE), along with an English translation that preserves the culture-sensitive metaphors (Table 10).

TABLE 10. Human and AI renditions to stanza 4

الأم مدرسة إذا أعددتها أعددت شعباً طيب الأعراق الأم روضٌ إن تعهده الحيا بالري أوزق أيما إيزاق الأم أستاذة الأساتذة الألى شغلت مآثرهم مدى الأفاق			
Human	ChatGPT	Gemini	
The mother, a school when nurtured with care; Her offspring, a great nation, superior and rare. A garden mother becomes if watered right; When blooming, minds take a wondrous flight. Mother, the teacher of teachers, revered and wise; Whose deeds and virtues touch the boundless skies.	The mother, a school, if well-prepared, A noble nation is thus declared. The mother, a garden, with rain's embrace, Blooms with life, in every space. The mother, the teacher of all who inspire, Her virtues spread, reaching far and higher.	A mother, a school, well-educated and wise, Nurturing minds, reaching for the skies. A mother, a garden, blooming bright, Filling the world with love and light. A mother, a teacher, inspiring all, Her virtues spread, answering life's call.	

The stanza above contains three culture-sensitive schemata—creative metaphors that liken *the mother* to a *school*, *garden*, and *teacher*. Each of these metaphors underscores the invaluable role of mothers in society. In Table 9, both the human and automated translations retain these metaphors literally, making them recognisable in English, though with varying degrees of cognitive processability. Culture-free schemata, being part of general human experience, are processed effortlessly. In contrast, culture-sensitive schemata often contain marked elements—such as *the mother as a school*—that may require greater cognitive effort from the target reader. These marked components often reflect local cultural references, like those found in Arabic traditions, rather than universally shared concepts. However, because these references form meaningful relationships with universally familiar ideas, they remain interpretable in translation, even if those connections feel novel to the reader.

In some cases, culture-sensitive proper nouns need to be mentioned rather than reinterpreted or avoided in translation if the cognitive load or thematic element is to be maintained. Consider George Gordaq’s (1933-2014) allusion to Abu Nawas (An Abbasid poet famed for writing on liquor) and Al-Khayam (A Persian poet who also has a similar reputation) in the following text, where mentioning the two names in the translation becomes inevitable (Table 11).

TABLE 11. Human and AI renditions to stanza 5

Human	ChatGPT	Gemini
In memory, the images of past’s drinkers take flight; With Abu Nawas and Al-Khayam, embracing the night. They sip from my dreams with pure delight; They love and in ecstasy, they intoxicate the night.	هل في ليلتي خيال الندامي والنواصي عائق الخياما وتساقوا من خاطري الأحلاما وأحبوا وأسكروا الأياما	In my night, a vision of companions did appear, Consoles embracing tents, drawing near. From my heart, they drank dreams, a flowing stream, Loved and intoxicated all the days, it would seem.

As can be noted, the human translator has successfully maintained the culture-sensitive schemata through transliteration, being aware that their reinterpretation or deletion would miss the theme altogether. Despite the fact that the allusion to Abu Nawwas and Al-Khayyam might be processed by readers familiar with the Arab and Persian literary heritage, it may be deemed appropriate to provide a footnote for the general reader to save them the effort of looking the allusion up in a reference source. By contrast, both GPT and GEM have failed to make sense of the allusion embodied in the proper nouns, thus producing incoherent translations. The former transliterates the first name as Al-Nuwasi and interprets the second as a predicate ‘the tents’ rather than a proper noun ‘Al-Khayyam’, producing the incomprehensible ‘Al-Nuwasi embraced the tents’. GEM, for its turn, interprets both of them as predicates, coming up with the unintelligible ‘consoles embracing tents’. In this example, culture-sensitive schemata embodied in proper nouns prove as formidable as culture-bound counterparts for AI system translators.

However, there are cases where the proper noun may prove transferable coherently by both human and AI translators. The personal name *Layla*, which represents a culture-sensitive schema reflecting the celebrated, platonic love story between *Qays* and *Layla* in the Arab literary heritage, needs to be preserved in the translation of the following verse and perhaps elsewhere in relevant material in order to bring out the theme embodied in the allusion.

TABLE 12. Human and AI renditions to verse 5

تداويت من ليلى بليلى من الهوى كما يتدواى شارب الخمر بالخمر		
Human	ChatGPT	Gemini
In Layla did I seek a cure from Layla's affection;	I healed my heart from Layla's pain with Layla's fire,	From Layla's love, I sought relief,
The way a drinker seeks a cure in more addiction.	Like curing drunkards' thirst with wine they still desire.	In Layla's love, I found my grief.

As can be observed, the three translators have transliterated the personal name *Layla*, whose poetic significance is assumed for readers familiar with the Arab culture and which can also fit coherently for those unaware of such significance, i.e. it may be interpreted as a routine love relationship between ordinary individuals. Notably, the human and GPT translations capture the paradoxical theme (Qays seeking treatment for Layla's love by loving her more the way a drinker seeks treatment for drinking by drinking more) in verse perfectly in terms of form and content. By contrast, GEM's rendition, albeit it makes a lot of sense, does not reflect the same theme.

LANGUAGE-BOUND SCHEMATA

Language-bound schemata are formal language elements that reflect content schemata by accident, thus aesthetically and subtly tying form and content together. Typical examples of language-bound schemata involve puns and wordplay, which are characteristics that are rarely shared by distant languages like Arabic and English. Therefore, they are formally lost in translation but thematically preserved. Al-Mutanabbi's poem opener (Table 13) provides a good example of a language-bound schema, which is illustrated below.

TABLE 13. Human and AI renditions to verse 6

لك يا منازل في القلوب منازل أقمرت أنت وهن منك أو اهل		
Human	ChatGPT	Gemini
You, abandoned home, lie high in our deeps;	To you, O dwellings, in hearts you remain,	O dwelling, hearts' abode, though vacant now,
And our house rises higher as, forsaken, it sleeps.	Though now deserted, your souls still sustain.	Your memory's gleam, a love's eternal vow.

The Arabic lexeme *manaazilu* in the first hemistich means 'homes' in the first instance but 'ranks' in the second, demonstrating the employment of polysemy as a poetical tool in addition to rhyme, meter, and parallelism. Since English lacks an equivalent polysemous lexeme, this polysemy-based schema is formally guaranteed to fail in translation because no English word can carry the Arabic two senses. Nevertheless, the theme conveyed by this poetic use of polysemy in Arabic is perfectly transferred in English by both the human and AI translators in Table 13. One should know that the deficit occurring due to missing the language-bound schema cannot be perceived by the target reader and does not affect the poetics of the translation because it is judged by other prosodic features, particularly imagery, meter and rhyme, which are effectively attended to in the three translations.

Finally, let us look at the following stanza by Imam Al-Shafi'i (767-820 CE), which is built around language-bound schemata, along with three translations.

TABLE 14. Human and AI renditions to stanza 6

Human	ChatGPT	Gemini
I've witnessed people, this truth be told; Head towards those with pockets of gold. But those without, they're often passed; In pursuit of fortune, they move so fast.	I saw the people naturally rush in haste, To those with gold, their hearts to taste. But those who lacked this gleaming hue, Were left behind, as crowds withdrew.	I saw the world, a gold-drawn throng, To gilded doors they ever long; But those devoid, they're left alone, Forsaken, wealth's allure unknown.

The thematic elements in the Arabic stanza in Table 14 have been successfully conveyed in the three English translations apart from the language-bound schemata investing in wordplay through the polysemous word ذهب ‘go/gold’. Both the wordplay and the humour stemming from it are completely lost in the English translation. Unlike the example in Table 13, where other prosodic features compensate for the loss, the impact here is different because humour is involved. When the ST text is juxtaposed with the TT, the stanza loses part of its appeal due to the loss of witty humour. Although both the human and AI translations effectively capture the theme and other prosodic elements, the humour does not fully carry over.

CONCLUSION

A schema-theoretic model of translating poetry is used in this paper from a cogno-prosodic perspective. The aim is to have the cognitive parameter align with the prosodic parameter vis-à-vis, producing an optimal degree of poetic coherence and cohesion. The paradigm is predicated on an interactive process involving four types of schemata—culture-free, culture-bound, culture-sensitive, and language-bound schemata—and encoding schematic realisation in TL, which is meant to reflect decoding schematic activity in SL. A TT, the result of translation activity, is produced through this dynamic interaction. The target readers, in their turn, subsequently evaluate the TT in light of how cohesive and coherent it is in its new sociocultural setting. Therefore, the degree to which the TT is cohesive and coherent in its new environment inside the target culture ultimately determines whether the poetic translation is successful or not.

Poetry has the unique ability to amplify the significance of prosodic features in translation (Boase-Beier, 2013; Dahlgren, 2019). Formal elements like rhyme and meter not only align with other aspects but can sometimes take precedence over content to ensure both poetic coherence and cohesiveness—the very essence of poetry’s legitimacy. However, current translation practice grapples with the challenge of rendering poetry in verse or prose. While prose translations prioritise integrity and coherence over formal elements, verse translations emphasise aesthetic qualities, particularly meter and rhyme, which embody poetic unity. The examples in this paper demonstrate how challenging the ‘verse’ option might be when attempting an alignment between form and content.

The findings of this paper show that culture-free schemata are the easiest to handle in terms of transferring thematic elements by both the human translator and the two AI translators under investigation (GPT and GEM). In fact, the same translator, whether human or machine, can offer multiple translations. However, both GPT and GEM noticeably lag behind human translation in handling culture-bound and culture-sensitive schemata, especially when they feature allusions to

proper nouns. This weakness is predictable and natural because it is not easy for the machine to distinguish between proper nouns and predicates, especially since their initials are not capitalised like English proper nouns, a fact that makes them disguise within connected discourse rather than stand out distinctly. Hence, AI poetic translations usually run the risk of being incomprehensible due to the inability to manage proper-noun-based allusions coherently. Language-bound schemata, in their turn, whose thematic elements are embedded in pun and wordplay, appear to lend themselves coherently in terms of thematic elements apart from pun and wordplay, which rarely match formally or functionally between Arabic and English. Thus, the only way to enhance AI systems' performance here is to enhance their database of proper nouns that may be used allusively or metaphorically between Arabic and English.

In terms of improvising prosodic features, human and GPT translations lead the way in capturing prosodic features like meter and rhyme, with GEM's translations lagging by a small margin. AI translators demonstrate a clear ability to compete with human translation, particularly in aligning thematic elements with prosodic features when rendering verses that involve culture-free or language-bound schemata. However, this effectiveness diminishes with culture-bound and culture-sensitive schemata, where prosodic features alone cannot prevent a breakdown in coherence. In such cases, what may be poetically cohesive can still lack coherence—failing schematically or cognitively. Despite such mishaps, AI systems can be of great help to translators, especially since they are interactive in nature and can produce multiple translations of the same poetic piece in no time (Haider & AlKhatib, 2024; Obeidat et al., 2024). There remains, however, ample room for enriching their technical capabilities, especially in recognising proper nouns and deciphering what they signify in poetic discourse.

REFERENCES

- Adams, R. M. (1973). *Proteus, His Lies, His Truth: Discussions of Literary Translation*. Norton.
- Alowedí, N. A., & Al-Ahdal, A. A. M. H. (2023). Artificial Intelligence based Arabic-to-English machine versus human translation of poetry: An analytical study of outcomes. *Journal of Namibian Studies: History Politics Culture*, 33, 1523–1538. <https://doi.org/https://doi.org/10.59670/jns.v33i.800>
- Al-Salman, S., & Haider, A. S. (2024). Assessing the accuracy of MT and AI tools in translating humanities or social sciences Arabic research titles into English: Evidence from Google Translate, Gemini, and ChatGPT. *International Journal of Data and Network Science*, 8(4), 2483-2498. <https://doi.org/https://doi.org/10.5267/j.ijdns.2024.5.009>
- Boase-Beier, J. (2013). Poetry translation. In C. Millán & F. Bartrina (Eds.), *The Routledge handbook of translation studies* (pp. 475-487). Routledge.
- Botirova, P., & Sobirova, R. (2019). Features of the Translation of Poetry into English. *Theoretical & Applied Science*(6), 383-387.
- Burkhanov, I. (2003). *Translation: Theoretical Prerequisites*. Wydawnictwo Uniwersytetu Rzeszowskiego.
- Dahlgren, M. (2019). Poetry translation and pragmatics. In R. T. L. Desilla (Ed.), *The Routledge Handbook of Translation and Pragmatics* (pp. 239-256). Routledge.
- Dastjerdi, H. V., Hakimshafaaii, H., & Jannesaari, Z. (2008). Translation of poetry: Towards a practical model for translation analysis and assessment of poetic discourse. *Journal of Language & Translation*, 9(1), 7-40.
- Farghal, M. (1999). Failing the Discourse in Translation: A Schematic Perspective. *International Journal of Translation*, 1(2), 85-102.
- Farghal, M. (2004). 'Two Thirds of a Boy are his Uncle's': The Question of Relevance in Translation. *Across Languages and Cultures*, 5(2), 257-269. <https://doi.org/https://doi.org/10.1556/acr.5.2004.2.6>
- Farghal, M. (2023). *Highlights from Classical Arabic Poetry in English Translation: A Schematic Model*. Eliva Press.
- Farghal, M., & Al-Masri, M. (2000). Reader responses in Quranic translation. *Perspectives: studies in Translatology*, 8(1), 27-46. <https://doi.org/https://doi.org/10.1080/0907676x.2000.9961370>

- Farghal, M., & Haider, A. S. (2024). Translating classical Arabic verse: human translation vs. AI large language models (Gemini and ChatGPT). *Cogent Social Sciences*, 10(1), 2410998. <https://doi.org/https://doi.org/10.1080/23311886.2024.2410998>
- Gao, R., Lin, Y., Zhao, N., & Cai, Z. G. (2024). Machine translation of Chinese classical poetry: a comparison among ChatGPT, Google Translate, and DeepL Translator. *Humanities and Social Sciences Communications*, 11(1), 1-10.
- Gutt, E.-A. (1996). Implicit information in literary translation: A relevance-theoretic perspective. *Target International Journal of Translation Studies*, 8(2), 239-256. <https://doi.org/https://doi.org/10.1075/target.8.2.03gut>
- Haider, A. S., & AlKhatib, R. (2024). Subtitling English Legal Acronyms into Arabic: Human vs Machine. *Kutafin Law Review*, 11(4), 810-842. <https://doi.org/https://doi.org/10.17803/2713-0533.2024.4.30.810-842>
- Halliday, M., & Hasan, R. (2014). *Cohesion in English*. Routledge.
- Hamat, A. (2024). The Language of AI and Human Poetry: A Comparative Lexicometric Study. *3L, Language, Linguistics, Literature*, 30(2), 1-20. <https://doi.org/http://doi.org/10.17576/3L-2024-3002-01>
- Lahiani, R. (2020). Poetry in Translation: Traveling Pleonasm and Beyond. *3L: Southeast Asian Journal of English Language Studies*, 26(3), 96-109. <https://doi.org/https://doi.org/10.17576/31-2020-2603-08>
- Lahiani, R. (2022). Aesthetic poetry and creative translations: a translational hermeneutic reading. *Humanities and Social Sciences Communications*, 9(1), 1-9. <https://doi.org/https://doi.org/10.1057/s41599-022-01481-1>
- Lahiani, R., Alfalasi, T., Alzaabi, A., & Alhassani, N. (2023). Translations of overtones in classical Arabic poetry: Optimality theory as a quality assessment framework. *Ampersand*, 11, 100143. <https://doi.org/https://doi.org/10.1016/j.amper.2023.100143>
- Munday, J., & Blakesley, J. (2016). Introduction Poetry Translation: Agents, Actors, Networks, Contexts. In (Vol. 25, pp. 1-9): Edinburgh University Press 22 George Square, Edinburgh EH8 9LF UK.
- Munday, J., Pinto, S. R., & Blakesley, J. (2022). *Introducing translation studies: Theories and applications*. Routledge.
- Niknasab, L., & Pishbin, E. (2011). On the translation of poetry: A look at Sohrab Sepehri's traveler. *SKASE Journal of Translation and Interpretation*, 5(1), 2-23.
- Obeidat, M. M., Haider, A. S., Tair, S. A., & Sahari, Y. (2024). Analysing the Performance of Gemini, ChatGPT, and Google Translate in Rendering English Idioms into Arabic. *FWU Journal of Social Sciences*, 18(4), 1-18. <https://doi.org/http://doi.org/10.51709/19951272/Winter2024/1>
- Pajares, E., & Romero, F. (1997). Translating and the reading process. *Babel*, 43(4), 289-302. <https://doi.org/https://doi.org/10.1075/babel.43.4.02paj>
- Pallavi, K., & Mojibur, R. (2018). A preliminary pragmatic model to evaluate poetry translation. *Babel*, 64(3), 434-463.
- Tsur, R., & Gafni, C. (2022). Metre, rhythm and emotion in poetry: A cognitive Approach. In R. Tsur & C. Gafni (Eds.), *Sound–Emotion Interaction in Poetry* (pp. 291-328). John Benjamins Publishing Company.
- Venuti, L. (2017). *The translator's invisibility: A history of translation*. Routledge.
- Welch, R. A. (1972). The Translation of Poetry: Some Principles. *Studies: An Irish Quarterly Review*, 61(244), 326-342.