Proverbs Translation for Intercultural Interaction: A Comparative Study between Arabic and English Using Artificial Intelligence

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Abstract

Proverbs are a source of wisdom and morals that have been passed on from one generation to the next throughout history. Through intercultural interaction, it appears that some proverbs were either translated or have equivalents in different languages and cultures. This study used artificial intelligence, specifically machine learning techniques, to examine five equivalent proverbs in Arabic and English. Emphasis was placed on the occurrence of equivalent proverbs in different contexts through a collection of actual language use. A topic modeling algorithm was applied to a dataset for each proverb to explore the latent topics/themes that construct its meaning. The results revealed subtle differences between equivalent proverbs in Arabic and English, mainly due to religious, cultural, and social factors. Translators are thus encouraged to be aware of nuances in meanings, develop intercultural pragmatic knowledge to communicate the intended meaning and avoid misunderstandings.

Keywords: proverbs, translation, machine translation, intercultural pragmatics, artificial intelligence

1. Introduction

Proverbs are a linguistic device used to express specific meanings and are generally classified as idioms. They often express wisdom, morals, or pieces of advice as an outcome of accumulated experiences. They are widely used in many languages and across different cultures. Naturally, some proverbs are similar between several languages, while some have been exchanged due to language and cultural contact. Translation is one of the main tools mediating the process of introducing or transferring proverbs between languages and cultures. However, translation is challenging as Newmark (1988 p.5) points out since it is concerned with "rendering the meaning of a text into another language in the way that the author intended the text". Translators are, thus, required to obtain a strong linguistic and intercultural pragmatic background of the source and target languages. The relationship between intercultural pragmatics and translation is quite close, considering the fundamental ideas of both concepts. Intercultural pragmatics serve as a guide for translating transcultural pragmatics and are expressed in the importance of foreign translation (Fan, 2018, p. 579). With contact as the primary concern, intercultural communication emphasizes both cultural differences and their causes.

The present study approaches proverb translation between languages as a form of intercultural interaction in which values, principles, and morals are exchanged between different communities. For instance, part of the contact between Arabic and English takes place through translating literary works, scholarly works, and news stories, which are often rich with proverbs that require advanced background to translate. Some proverbs have equivalents in several languages but may have different meanings and uses. The different meanings and uses of proverbs may underlie a set of cultural, social, and religious factors among others. The present study aims to explore such factors. Identifying such factors may be achieved by investigating actual language use of proverbs, followed by comparative analysis to explore the differences in themes and context of use characteristic of each culture. To this end, artificial intelligence can be utilized to determine the topics or themes associated with proverbs in Arabic and English using collections of instances of language use. By extracting the various themes of proverbs in Arabic and English, the social and cultural background should be unveiled, and communicate meaningful information about the speech community. Such meaningful information should improve the quality of translation for literary works, media, and educational purposes. To the best of the researchers' knowledge, there has been no previous study that addresses the factors that account for nuances in meaning and use among equivalent proverbs in Arabic and English using artificial intelligence.

2. Background of the Study

Mieder (1994) defined a proverb as "a short, generally known sentence of the folk which contains wisdom, truth, morals, and traditional views in a metaphorical, fixed and memorizable form and which is handed down from generation to generation" (p. 38). Proverbs are based on routine experiences and observations in an aphoristic and metaphoric way, and often symbolize words of wisdom. They gain momentum especially when associated with prominent figures. Scholars vary in their views regarding the origins and emergence of proverbs; however, they agree they have persisted over time. They are also influenced by individuals' experiences, developing intentionally or unintentionally by ordinary people before they are universally acknowledged and accepted as words of wisdom across

cultures. They appear in oral tradition, culture, art, and literature to provide a moral message and folk wisdom.

Proverbs take their distinctive concrete form through concrete formulation by one individual in response to some set of circumstances, acceptance by people more generally, and possible modification of phraseology, aligning the time to public sentiment (Firth,1997). Whiting (1931) affirmed that the creation of a proverb was perhaps the work of an author issued separately or used in an extended literary work, or of an individual who planned to use his name in the proverb itself. Original proverbs and statements may evolve over time, with verbal folklore becoming an anonymous proverb whose wording, structure, style, and metaphor are such that it is memorable (Mieder, 2004; 2007).

Arora (1984) pointed out that proverbs are characterized by stylistic features such as alliteration (e.g., forgive and forget), parallelism (e.g., nothing ventured, nothing gained), rhyme (e.g., when that cat is away, the mice will play), and ellipsis (once bitten, twice shy). They are also self-contained and syntactically independent of surrounding discourse (Norrick, 1985) e.g., like father, like son, better late than never. Furthermore, proverbs are traditional, non-literary, recurring, and non-learned, as in time is money; don't put the cart before the horse, since they represent specific folklore and recurring verbal performances (Firth, 1926; Taylor, 1950; Mieder, 1996). Typically, proverbs are didactic in nature and contain wisdom, truths, morals, and traditional views (Mieder, 1996). Look before you leap and ill got ill spent are proverbs that feature didactic content. Nevertheless, Moon (1998) argued convincingly that proverbs are both comparatively rare and variable in everyday discourse, but they remain recognizable to members of the speech community due to their high salience. Finally, proverbs have metaphoricity in traditions and culture, making them memorable and recognizable, but it is a matter of degree rather than an absolute dichotomy (Seiler, 1922).

By looking at the literature, it can be noted that both literal translation and semantic translation are valid methods in the translation of proverbs in a cultural context from one language to another (Meliboevich, 2022, p. 618). However, for international proverbs that do not belong to a specific culture, it might be more appropriate to rely on equivalents instead. As a result, the interpretation of meaning depends on using corresponding equivalents or 'descriptive translation' if the translator is aware of the meanings of the texts (p. 619).

Meliboevich (2022) explains that when analyzing the use of proverbs and idioms in a text, valid translation requires "a translator to consider cultural elements and the specificity of the language units, such as proverbs and idioms, which have a critical effect on the selection of a concrete strategy of translation in a particular case or situation" (p. 620). Further, the same author also added that culture, as a research phenomenon in language and communication studies, was initially reported in 1990s studies that were related to foreign languages, comparative linguistics, and translation theory.

The task of translation has been aided by computational solutions through machine translation since the 1950s. Several machine translation approaches have been developed, such as rule-based translation, statistical machine translation, and neural network machine translation (see for a review, Garg & Agarwal, 2018). As a result, the quality of machine translation has improved significantly. Scholarly works on proverb translation in Arabic have varied between identifying the equivalents in English (2008), studying them from educational perspectives (e.g., Ahmed, 2005; Khalifa, 2015; Sameer, 2016), and considering them from a linguistic or literary perspective (Ilyas, 2013, Thalji, 2016). Another strand of research examined the accuracy of Arabic–English machine translation (e.g., Hamdi, 2013; Al-khresheh, 2018). Generally speaking, the application of artificial intelligence in proverb translation is concerned with the availability and quality of machine translation tools. However, utilizing artificial intelligence techniques to study the subtle social and cultural elements of common proverbs in Arabic and English would further enrich Arabic content.

3. Methods

Topic modeling is a statistical method utilized to extract a set of probable terms that characterize a corpus or a collection of documents. It aims to uncover unknown patterns in large collections of texts to make it possible to determine their underlying semantic meanings (Steyvers and Griffths, 2007; Blei and Lafferty, 2009). A topic modeling algorithm was used to generate themes that described the main concepts associated with proverbs in both Arabic and English datasets. As unsupervised machine learning algorithms, topic models explore the distribution of topics over a corpus to return a set of terms divided into clusters. They have been widely used in social science (see Ramage et al., 2009; Grimmer and Stewart, 2013; Valdez et al., 2019) to study a range of issues in media and literature.

Several approaches have been developed for topic modeling, including latent Dirichlet allocation, latent semantic analysis, and non-negative matrix factorization (NMF), in which the focus is on identifying the frequency and co-occurrence of words in a corpus. This study applied NMF (Lee and Seung, 1999), where input data were factorized into two matrices corresponding to words and the documents that contain them. Adapted codes from Pedregosa (2011) and NLTK (Bird et al., 2009) were used to preprocess the datasets. The frequency of occurrence was calculated for each term, excluding elements that had negative values. Due to the small size of the dataset, only four topics were thought to be appropriate, with each comprising five terms.

After identifying the topics, we examined the semantic aspects of proverbs to explicate their salient shared and distinct features in Arabic and English. Emphasis was placed on the overall meaning or domain of use, connotation, lexical relations, and contextual information available in the data. Instances of proverb use were utilized in the analysis and discussion.

3.1 Data Collection

A list of five common proverbs that have equivalents in Arabic and English was prepared using Jabak (2008) The selection of proverbs was based on their availability and high frequency in the selected corpora, and to allow for meaningful analysis. We referred to the Matti

Kuusi (Lauhakangas, 2001) international type system of proverbs to describe the thematic classification of the proverbs under study, as shown in Table 1. Kuusi's typology classifies proverbs into 13 themes with 52 main classes and 325 subgroups, under which proverbs from different languages express the same basic ideas. This typology helped to guide the initial analysis stage of the results.

Table 1. Thematic distribution of proverbs based on Kuusi's typology

Proverb	Thought/basic idea	Theme
Charity begins at home الأقربون أولى بالمعروف	One should start helping or taking care of those near to him	Social interaction Managing on one's own: trusting other people / strangers One's own profit and own troubles come first
Necessity is the mother of invention الحاجة أم الاختراع	Our needs encourage us to find creative ways to meet them	The world and human life Dynamics of needs Distress, need and hunger activate; lead to ideas, innovations or crimes
The end justifies the means الغاية تبرر الوسيلة	When the desired result is important, it excuses wrong or immoral methods of doing or getting it.	Concepts of morality Good and evil - success Evil will succeed; hold its own > the decent person will suffer
To add oil/fuel to the fire صب الزيت على النار	To make a situation even worse	Social interaction Aggression & peaceableness Unwillingness to forgive, revenge - being appeased, conciliated
Love is blind الحب أعمى	Lovers are unwilling to perceive each other's faults	The world and human life Dynamics of needs Love as strong, daring, blinding, heedless and inventive

Then, we proceeded to collect data from Skitch Engine (Belinkov et al., 2014), which hosts large corpora from several languages, including Arabic and English. A subset of around 1000 instances of actual language use of each proverb was extracted from both the Arabic and English corpora. Some proverbs in Arabic were misspelled or had various morphological forms to mark tense or gender which required modifying of the search term to return more results. A separate spreadsheet file with the returned results was saved for each proverb. Then, preprocessing was conducted, including tokenization, stopword removal, stemming, and normalization through term frequency-inversed document frequency. Proverbs and their component words were excluded during preprocessing to disallow them from occurring in the resulting topics. Each file was processed and analyzed separately after applying the algorithm.

4. Results and Discussion

By applying the proposed algorithm to the dataset for each proverb, the returned results were obtained and are presented in the following sections. All proverbs in both Arabic and English agreed with Kuusi's typology in general. However, the actual use of proverbs showed differences that are unique to each language, as the results reflect. Quality topics were determined based on their weighted sums and distribution of terms. Naturally, similar terms appeared in Arabic and English topics, as well as unique ones.

Proverb 1: Charity Begins at Home/الأقربون أولى بالمعروف

The overall meaning of the terms in Arabic agreed with the basic idea of the proverb that prioritizes helping and giving to relatives. The distribution of terms across the topics suggested positive or neutral connotations, as demonstrated in Figure 1. Lexical relations between terms included hypernyms and hyponyms, as in Islam/Zakat (obligatory charity), and synonyms e.g., countries/home. Topic 4 was the most significant topic, with a weighted sum of 3.4, featuring terms that represent the parties where charity or help should go, such as family, city, and home.
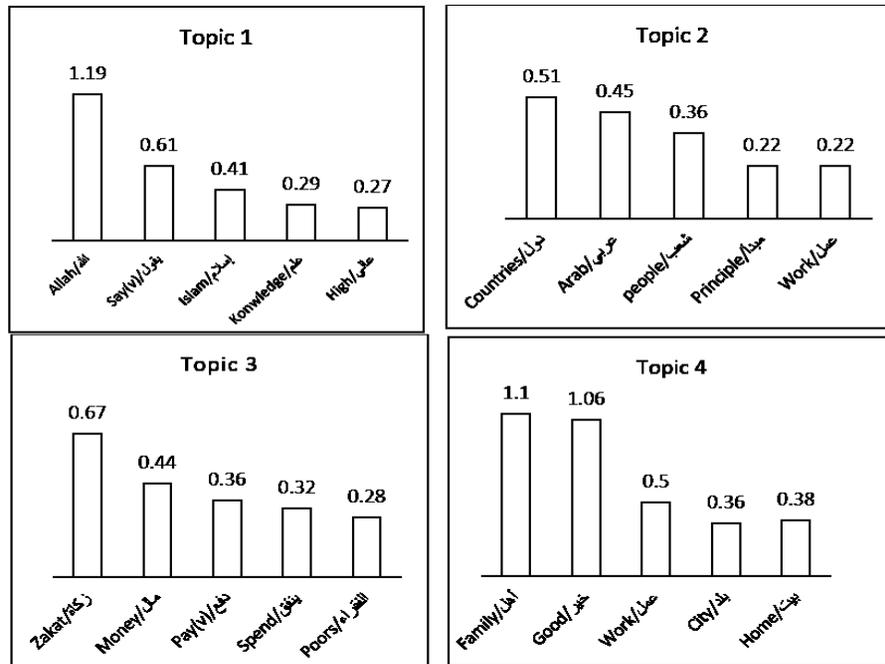
Figure 1. Topics distribution of proverb 1 in Arabic

In English, the use of the proverb corroborated its basic idea, with positive or neutral connotations. Lexical relations between terms were synonyms e.g., care/help, and antonyms, as in give/take. Topic 4 was the most significant topic, with a weighted sum of 2.49, giving priority of help and care to the family, as demonstrated in Figure 2. Common terms in both Arabic and English were family, home, people, and say, where language users refer to the beneficiaries of the charity.
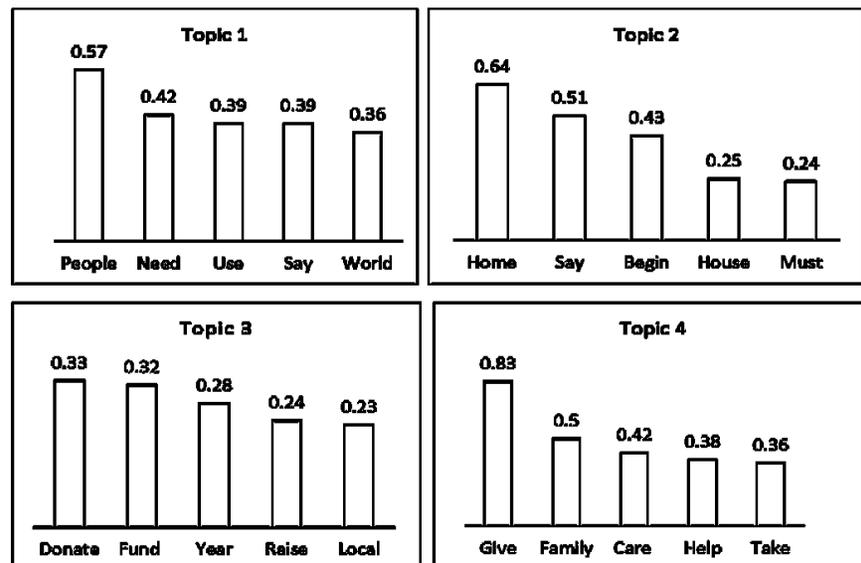

Figure 2. Topics distribution of proverb 1 in English

Proverb 2: Necessity is the mother of invention/الحاجة أم الاختراع

The distribution of terms associated with proverb 2 in Arabic described the parties who make use of inventions and the domains of inventions, as shown in Figure 3. This was demonstrated by words like human, people, and nation, as well as life, research, thought, and language. Lexical relations between the terms were synonyms e.g., creativity/innovation, and the hypernym human, along with its hyponyms (people, nation, child). Topic 4 was the most significant topic, with a weighted sum of 1.93, focusing on the forms of innovative ideas.
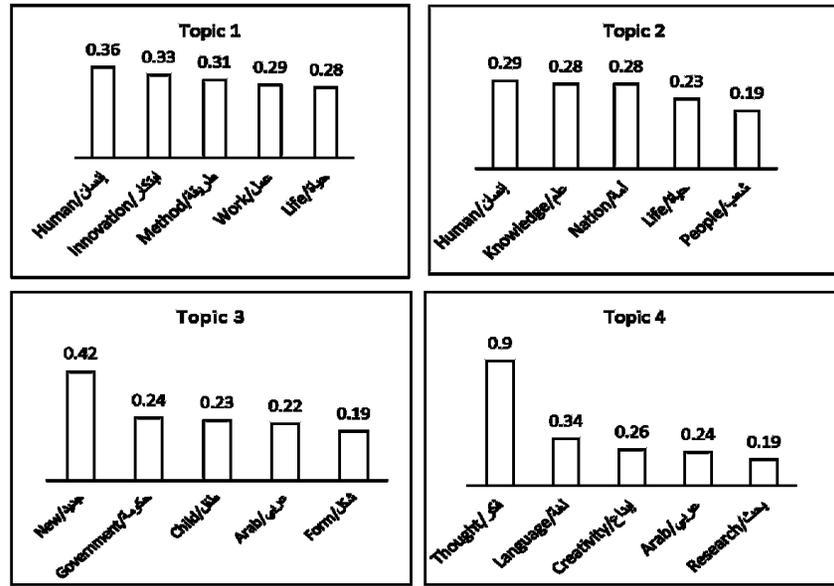
Topic 1

0.36 Human/إنسان
0.33 Innovation/ابتكار
0.31 Method/طريقة
0.29 Work/عمل
0.28 Life/حياة

Topic 2

0.29 Human/إنسان
0.28 Knowledge/علم
0.28 Nation/أمة
0.23 Life/حياة
0.19 People/شعب

Topic 3

0.42 New/جديد
0.24 Government/حكومة
0.23 Child/طفل
0.22 Arab/عربي
0.19 Form/شكل

Topic 4

0.9 Thought/فكر
0.34 Language/لغة
0.26 Creativity/إبداع
0.24 Arab/عربي
0.19 Research/بحث

Figure 3. Topics distribution of proverb 2 in Arabic

Proverb 2 shows a variety of terms in English that express attempts to introduce new solutions and methods to improve or overcome existing problems and challenges. These solutions or innovations were often technology-based and designed for business and industry needs. Lexical relations between items were antonyms e.g., new/old. Topic 4 was a quality topic, with terms that convey the message of the proverb, with a weighted sum of 2.97 as shown in Figure 4.

Topic 1

0.65 Principle/مبدأ
0.58 Work/عمل
0.55 Truth/حقيقة
0.53 Goal/هدف
0.47 Move out/تنفيذ

Topic 2

0.54 Brother/أخ
0.47 Muslim/مسلم
0.41 Lie/كذب
0.38 Religion/دين
0.32 People/الناس

Topic 3

1.83 Political/سياسي
0.95 Moral/أخلاق
0.7 Religion/دين
0.43 Values/قيم
0.38 Islam/إسلام

Topic 4

0.35 Machiavelli/ميكافيلي
0.35 Principle/مبدأ
0.34 Quotes/مقولة
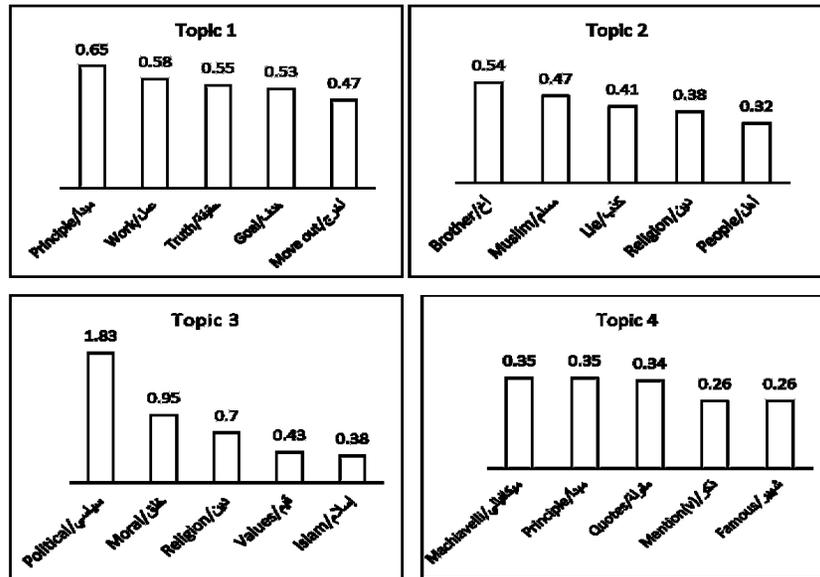0.26 Mention(v)/ذكر
0.26 Famous/شهير

Figure 4. Topics distribution of proverb 2 in English

Proverb 3: The end justifies the means/الغاية تبرر الوسيلة

It can be seen from Figure 5 that the distribution of terms in Arabic suggested that proverb 3 is used with caution concerning the legitimacy or morality of the method or approach to doing things. This was demonstrated by words such as *truth*, *lie*, *political*, and *values*, which may carry positive or negative connotations. Topic 3 was the most significant topic, with a weighted sum of 4.29, and suggested the possible contexts where proverb 3 may be used or misused.
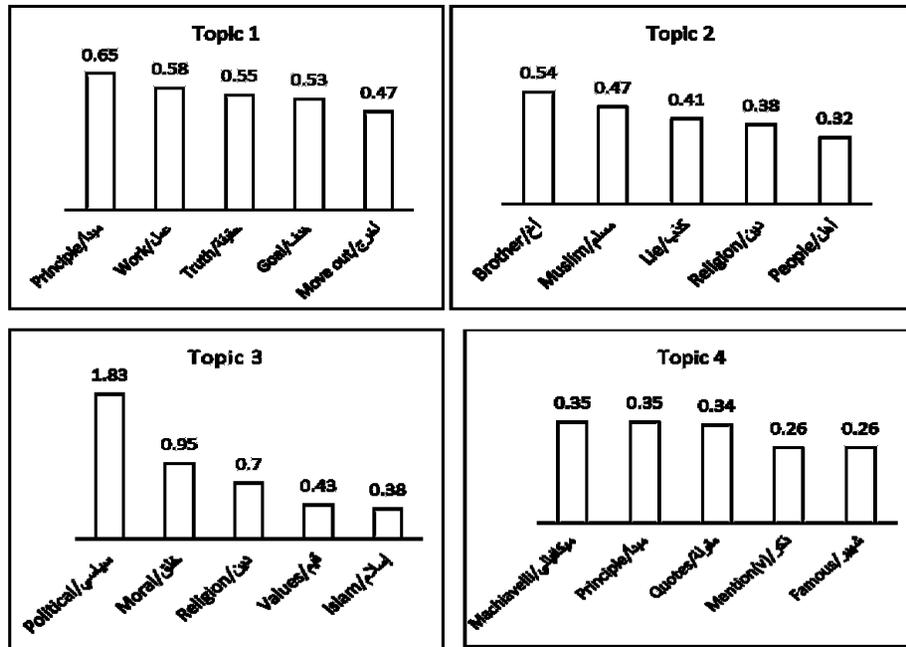
Figure 5. Topics distribution of proverb 3 in Arabic

The use of proverb 3 in English exhibited a similar pattern to Arabic (see Figure 6), in which words like *moral, goal, principle, lie, and political* were also present. It seems that both English and Arabic recognize the controversial use of proverb 3, which requires language users to have a sound pragmatic background to interpret the intended meaning. Topic 3, with a weighted sum of 2.38, was the best quality topic, featuring terms that suggested references to evaluating the legitimacy of the means.
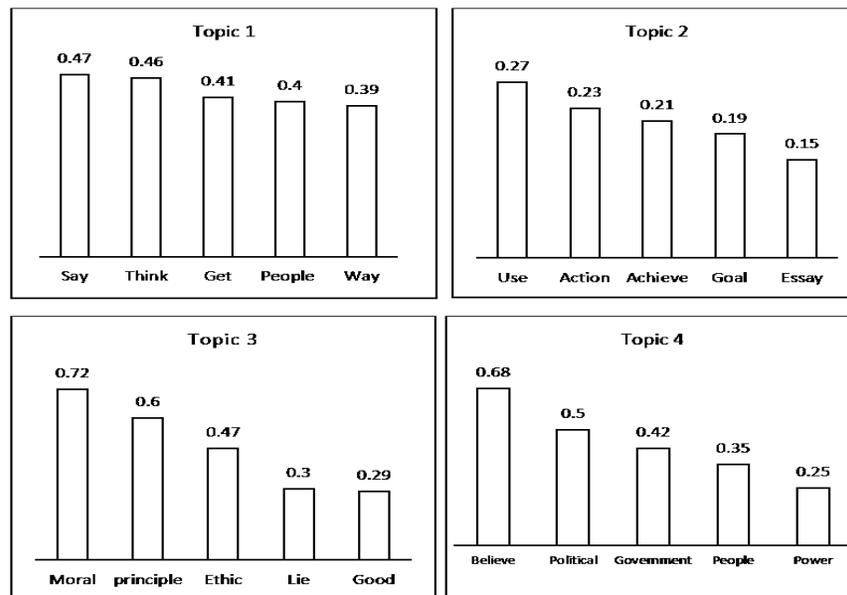
Figure 6. Topics distribution of proverb 3 in English

Proverb 4: To add oil/fuel to the fire/صب الزيت على النار

Proverb 4 is used in Arabic mainly within the political context. It expresses social interaction toward various issues, with rather negative connotations in words like *war*, *sectarian*, and *trial*, as demonstrated in Figure 7. Government and political parties are often projected as responsible for the problems, along with intervention from other countries. Topic 2 was the most significant topic, with a weighted sum of 2.36. The English use of proverb 4 was characterized by a diverse distribution of terms across the topics, as shown in Figure 8. These terms were concerned with political, market/business, and public issues. Topic 2 was the most significant topic, with a weighted sum of 1.83.
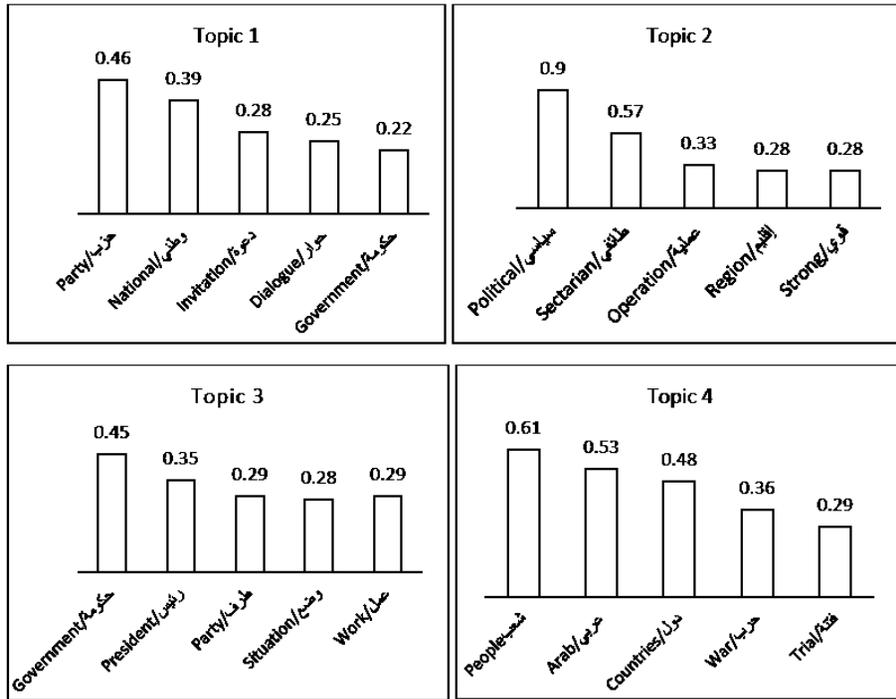
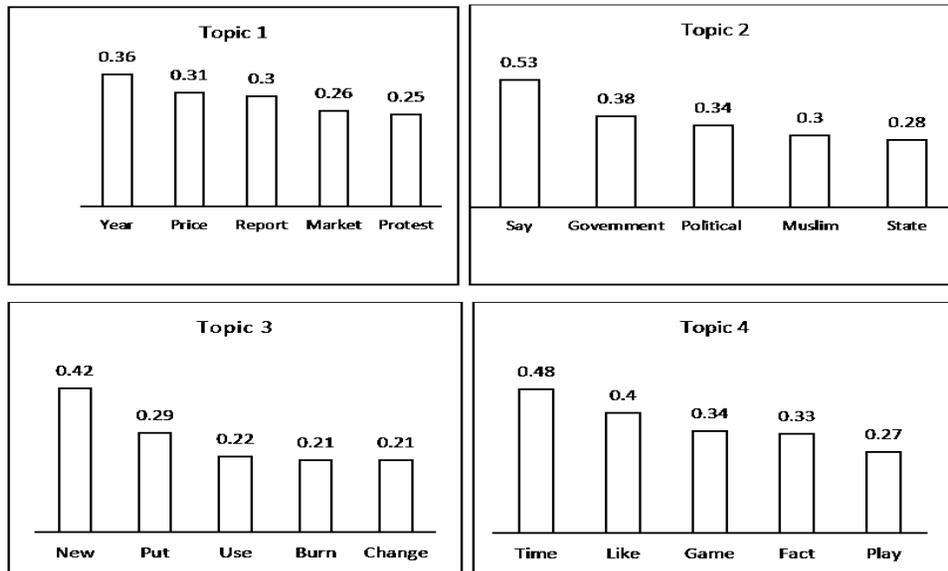Figure 7. Topics distribution of proverb 4 in Arabic

Figure 8. Topics distribution of proverb 4 in English

Proverb 5: Love is blind/الحب أعمى

The set of terms that occur with proverb 5 in both Arabic and English were associated with romantic relationships and marriage, in which people comment on whether the partners are a good fit for each other. There were references to *family*, *look* (formal meeting for the partners to see each other), *norm*, and *shortcomings*, along with man and woman, in the Arabic dataset, as demonstrated in Figure 9. The English dataset used proverb 5 in a more general context, as in *films*, *song*, along with various news stories and events (see Figure 10). Topic 2 in Arabic and Topic 4 in English were the most significant topics, with a weighted sum of 2.52 and 3.18, respectively.
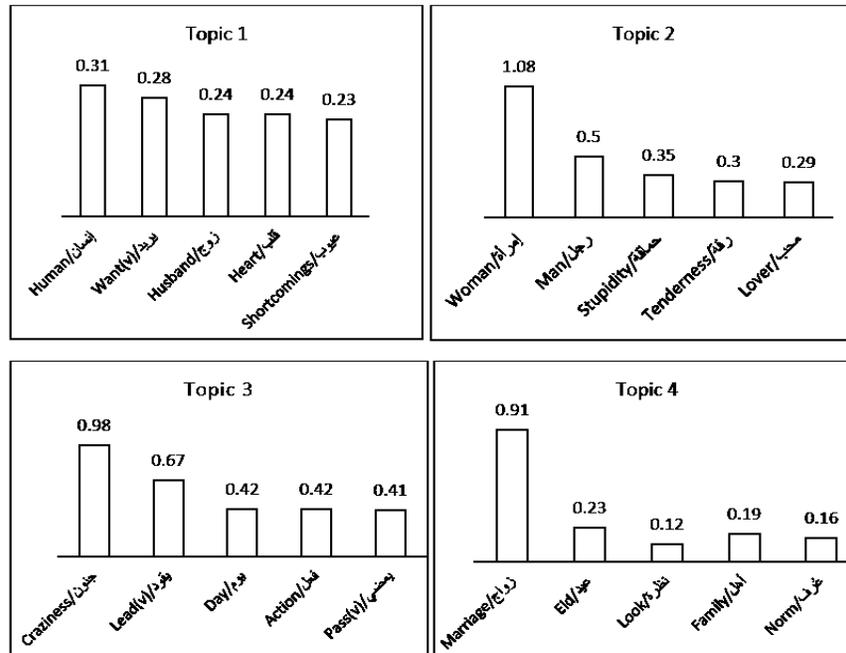
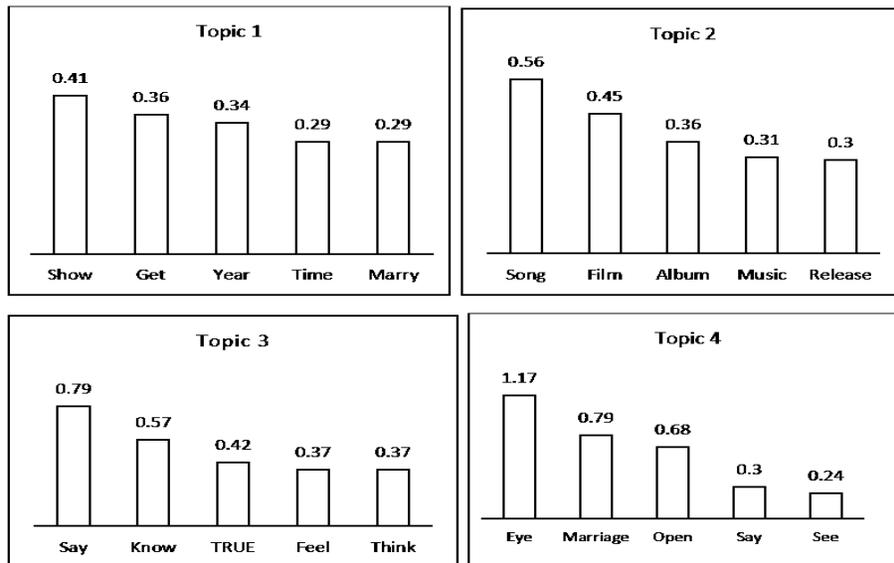Figure 9. Topics distribution of proverb 5 in Arabic

Figure 10. Topics distribution of proverb 5 in English

Although both Arabic and English share basic ideas of proverbs with Kuusi's typology, topic modeling helped explore the latent semantic aspects in the datasets. These aspects revealed the subtle differences in using proverbs, represented by the occurrence of various terms across the topics. The differences in use are informed by religious, cultural, sociopolitical, and business factors. For instance, the Arabic use of proverb 1 is motivated by a religious background in which there are obligatory and voluntary charities that Muslims should observe. This is represented by words such as Allah, Zakat, and Islam, as in الإسلام للإنسان أن يقف على أهله وذريته وأقربائه فالأقربون أولى بالمعروف for Islam is for the human to take care of his family, children, and relatives since charity begins at home. On the other hand, the English use of proverb 1 is motivated more by social interactions to support people in need of charity. This meaning is implied in words like donate, fund, help, and people, e.g., I am not saying that giving aid to people in need is wrong or should be stopped. However, they say, "charity begins at home". The religious factor is also present in proverb 3 (the end justifies the means) in Arabic, concerning the legitimacy of the reference to evaluating the 'means'. The legitimacy of the English use of the proverb is informed by a more moral view (e.g., moral, ethical, good), while Arabic makes reference to Islam, Muslim, religion, and brother to set a religious foundation for the evaluation.

Proverb 5 exhibits a culture-specific application of the basic idea of the proverb. Here, the occurrence of words like family, norms, and shortcomings suggests the crucial role of the family in participating in deciding marriage relationships for their members in the Arab world, و الاهل دوما عند هم الخبرة التي تؤهل هم من الاختيار الصائب لولد هم / احيانا يكون الحب أعمى e.g., for families have always experience

that qualifies them to choose the best for their sons but sometimes love is blind. The use of proverb 5 in English seems more liberal, including emotional or romantic relationships that are not necessarily for marriage purposes, as in yes, attraction is still important, but it is equally important for you to be able to see through it. They say "love is blind". The sociopolitical context dominates the use of proverb 4 in Arabic and English. However, it is mainly used in Arabic to describe or comment on conflicts and contentions between political parties and elites, whereas in English there is a broader context of business and public issues. Proverb 2 in English is characterized by an emphasis on market needs and business opportunities to promote invention and innovation efforts, while in Arabic the emphasis is on empowerment and giving access to people to serve their nation. This slight difference in emphasis between Arabic and English may be motivated by collectivist or egalitarian views, respectively.

The underlying subtle differences when using equivalent proverbs in Arabic and English often go unnoticed. However, by examining collections of actual language use, they can be identified. Thus, it is important to consider the cultural context so as to reflect the associated beliefs and values during translation. It is challenging for translators and interpreters to be aware of the nuances and convey the intended meaning. Nonetheless, developing an intercultural pragmatic knowledge of both the source and target languages should improve the quality of translation or interpretation.

Intercultural pragmatics address four domains: (1) Communication between native speakers and non-natives speakers of a language, (2) lingua franca interactions, where no two interlocutors share the same L1, (3) multilingual conversation, and (4) language use and growth of people who speak many languages (Kecskes, 2016). Translators and interpreters might find themselves working on conversations or texts from one of these domains. Intercultural pragmatics are "interactionally" and "socially" shaped in communication, as Kecskes pointed out (2008, 2010, 2014) and they can also be dependent upon specific cultural representations and standards that embody the language/discourse system the speakers belong to. Interculturality may be viewed as an interim rule system that is both normative and emergent. Constructs and models of culture change diachronically, whereas social representations and speech production by interlocutors change synchronously in response to the circumstances at hand. This takes place, for instance, during interpretation, which deals with translating spoken language in real time, where interpreters may try to translate a proverb using the cultural background of the target language. Here, intercultures are made during a communicative process, wherein cultural norms and models that the interlocutors bring to the conversation from their earlier experiences combine with elements that are made up on the spot (Kecskes 2016). It follows that proverbs, as a form of intercultural interaction, should be approached carefully during translation to better communicate their cultural content and avoid misunderstandings.

5. Conclusion

Although there are similar proverbs in many languages and cultures, they should not be mapped on to their equivalents in the target language without proper consideration of the cultural and social context. This study examined a set of equivalent proverbs in Arabic and English that are also common in other languages, and revealed nuances based on actual language use. These nuances were explored using artificial intelligence techniques and collections of texts. The differences in use could be explained in terms of religious and cultural factors. It is therefore crucial for translators and interpreters to be aware of such nuances in order to express the intended meanings. Developing a sound intercultural pragmatic background should improve the quality of proverb translation. The findings of the present study should be useful in providing translators and researchers from other related areas (e.g., machine translation, ethnography) with insights into the varying contexts and, thus, meanings of equivalent proverbs to be taken into consideration.

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