Translations and differences in the sets of iconic possibilities:
Two examples

Miguel López-Astorga[1]
(milopez@utalca.cl)

Resumen:

Cuando se trata de traducir un trozo de información a otro idioma de una manera tan literal como se permita en el segundo idioma, muchas veces se puede observar que el significado o el sentido no son exactamente iguales. Este trabajo analiza este fenómeno desde la perspectiva de la teoría de los modelos mentales. Basado en este esquema, se intenta describir lo que pasa desde un punto de vista cognitivo en estos casos. Para ello se consideran dos ejemplos. El primero se refiere al hecho de que algunos adjetivos posesivos indican género en inglés y esos mismos adjetivos posesivos no lo hacen en castellano (español). El segundo considera las diferentes traducciones que una palabra como "fish" puede tener en español.

Palabras clave: Iconicidad – Significado – Modelo mental – Posibilidad – Traducción

Abstract:

When it is tried to translate a piece of information into another language in a way as literal as allowed by the second language, many times it can be observed that the meanings or the senses are not exactly the same. This paper analyzes this phenomenon from the perspective of the theory of mental models. Based on this framework, it is intended to describe what happens from a cognitive point of view in those cases. Two examples are taken into account to do that. The first one refers to the fact that some possessive adjectives indicate gender in English and those very possessive adjectives do not do that in Spanish. The second one considers the different translations a word such as 'fish' can have in Spanish.

Key words: Iconicity – meaning – Mental model – Possibility – Translation

---

[1] Doctor en Lógica y Filosofía de la Ciencia, Universidad de Cádiz, España. Profesor Asociado en Instituto de Estudios Humanísticos "Juan Ignacio Molina", Universidad de Talca, Chile.

Introduction

It is well known that there are cases in which, when a sentence in a language is translated into another one, one of the versions seems more ambiguous or less exact. A theory such as the one of mental models (e.g., Bucciarelli & Johnson-Laird, 2019; Johnson-Laird, 2012; Khemlani, Byrne, & Johnson-Laird, 2018; López-Astorga, 2019; Quelhas & Johnson-Laird, 2017) gives an account of how the human mind works and makes different intellectual activities. So, one might expect that a cognitive framework such as that one should be able to explain what happens in those cases too, and hence why the human mind notes that one of the versions is less informative than the other one.

This paper is intended to show that the theory of the mental models indeed can do that. That goal will be achieved by means of two very simple and obvious examples. One of them is the case of possessive adjectives, which can refer to gender in English, but not in Spanish. The second one is based on the options to translate a word such as 'fish' from English into Spanish, which can lead to different meanings.

Thus, first, the paper will describe the general lines of the theory of mental models regarding sentences. Then, it will comment on the differences existing between English and Spanish as far as the gender of possessive adjectives is concerned. Third, the possible translations of 'fish' into Spanish will be analyzed. Finally, it will address what, from the cognitive point of view, those two examples can imply under the approach of the theory of mental models.

The theory of mental models and its iconic possibilities

Descriptions of the way the theory of the mental models understands sentences are to be found in many works of cognitive science literature. This section will be mainly based upon the one of López-Astorga (2019), which in turn basically follows that of Khemlani et al. (2018).

According to papers such as those indicated, it can be claimed that the theory of mental models has an essential thesis: when a person processes or interprets information, he or she tends to represent iconically on his or her mind the possibilities in which that very information can be true. An example can make this clear.

(1) "If Pam is not well then she has the flu" (Khemlani et al., 2018, p. 1890; see also López-Astorga, 2019, p. 235).

Resorting to a way to express the iconic possibilities combining, for example, one of the those used by Khemlani et al. (2018), that in López-Astorga (2019), and the one in Khemlani, Hinterecker, and Johnson-Laird (2017), it can be said that the iconic possibilities corresponding to (1) are:

(2) Possible (Pam is not well & Pam has the flu)
(3) Possible (Pam is not well & Pam does not have the flu)

(4) Possible (Pam is well & Pam does not have the flu)

Possibilities (2), (3), and (4) are possibilities [V.1], [V.4], and [V.3] respectively in López-Astorga (2019). In fact, the content between brackets in (2), (3), and (4) literally reproduces [V.1], [V.4], and [V.3]. It is not between quotes here because it represents iconic possibilities and that could cause confusions. However, the important point for this paper is that, following the theory of mental models, the semantic connotations of the words or expressions, and sometimes certain pragmatic situations, are the basic factors that actually lead to the possibilities assigned to sentences (see also, e.g., Orenes & Johnson-Laird, 2012). Thus, for example, semantics can become even more relevant than the order of the content of the clauses in a sentence. This can be seen in an obvious manner if a conditional such as (5) is taken into account.

(5) "If Pam is well, then she does not have the flu" (López-Astorga, 2019, p. 236).

As indicated by López-Astorga (2019), the iconic possibilities that can be attributed to (5) are exactly the same as to (1), that is, (2), (3), and (4). And this demonstrates that the syntactic way a sentence appears can be less relevant than the semantic meaning of its words. The key concepts are here 'well' and 'flu.' They can be combined in three ways: 'not-well' and 'flu' (2), 'not-well' and 'not-flue' (3), and 'well' and 'not-flu' (4). Following López-Astorga (2019), the only combination that cannot be admitted is 'well' and 'flu,' and that because it can be hard to accept the possibility of being well and having the flu at once. So, it is evident that in this case the meanings of 'well' and 'flu' are what really matters, and not the exact manner they are linked in natural language.

There is no doubt that much more could be said about the theory of mental models. This is so because the theory deals with very different aspects related to language and cognition. Nevertheless, what has been commented on in this section can be enough for the aims of this paper.

Possessive adjectives and gender

The first problem to analyze here from the framework of the theory of mental models is the difference existing between the determination of gender in possessive adjectives in English and in other languages. The example in this paper will be, as indicated, Spanish.

It is well known that the English third person singular possessive adjectives (i.e., 'his', 'her', and 'its') point out the possessor's gender. This is not that way in Spanish, which can cause a literal translation into this last language to be less informative. An example can better show this fact:

(6) He gave you her pencil.

A sentence such as (6) necessarily refers to three different individuals. This can be easily noted if sub-indices are used in a similar way as in studies such as the one of Hornstein (1995), and (6) is written again as follows:

(7) He$_i$ gave you$_j$ her$_k$ pencil.

In (7), 'i', 'j', and 'k' show that the speaker is considering, as said, three different people. None of them can be joined to other one. Sub-index 'i' stands for a male gender person different from both the speaker and the listener. Sub-index 'j' represents the listener. Lastly, sub-index 'k' refers to one more person, who is female gender and is also neither the speaker nor the listener.

But all of this changes if (6) is translated into Spanish:

(8) Él te dio su lápiz.

The problem with (8) is that it can be interpreted both that it refers to three people and that it only speaks about two people. The difficulty is exactly in 'su', which is the translation of 'her.' This is so because 'su' does not denote gender, and, accordingly, it can be used both if the possessor is male gender and female gender. Thus, while it might be thought that, as in (7), 'su' refers to a person different from the subject 'él', which is the translation of 'he,' and the sub-indices might be assigned in this way:

(9) Él$_i$ te$_j$ dio su$_k$ lápiz.

Given that 'su' does not differentiate gender and it might denote a male gender individual too, another possibility is to co-index 'él' and 'su' by understanding that they refer to the same person (for the use of sub-indices, see also, e.g., Hornstein, 1987). The result in this case would be:

(10)   Él$_i$ te$_j$ dio su$_i$ lápiz.

How all of this can be interpreted from the point of view of the theory of mental models, as well as the manner this theory can offer an account of why (8) is less informative than (6) is explained below. However, before that, the next section is devoted to another example that will allow understanding how the theory works as well.

The difference between 'pez' and 'pescado' in Spanish

A similar example, but conversely, is provided by the couple of words 'pez' and 'pescado' in Spanish. These words have close meanings, but there is an important difference that can cause the English translations to be more ambiguous. Both of them can be translated as 'fish.' However, while 'pez' refers to the water vertebrate animal, 'pescado' denotes that very animal but just when it has been got out from water by means of any method of fishing. Thus, these sentences show the possible translation problems in an evident way:

(11)   Tengo dos pescados.

The translation of (11) into English is:

(12)   I have two fish.

Example (11) indicates that the fish has been got out from water. Nevertheless, (12) does not allow being sure about that. This last sentence can be used, for example, both for saying that I have two fish to eat in the fridge and for stating that I have two fish in a fishbowl as pets.

This can also be understood from the theory of mental models. That is so because the theory can give an explanation of what happens from the cognitive point of view when (11) and (12) are listened or read as well. The following section addresses both the case of possessive adjectives described above and this last one.

The theory of mental models, possessive adjectives in English and in Spanish, and the translations of 'fish' into Spanish

Actually, this paper is not the first work using the theory of mental models as a methodological tool to study linguistic problems. The literature shows many works analyzing the iconic possibilities corresponding to an expression and the changes that can be made in them if some characteristic or element of that expression is modified, as well as the ambiguities or problems of interpretation related to possibilities one particular sentence or kind of sentences can present (e.g., López-Astorga, 2019). Nonetheless, this paper can be deemed as different from other previous ones in at least one sense. Beyond the fact that it is not in dialogue with other contemporary linguistic frameworks, and that it reviews the phenomena exclusively from the approach of the theory of mental models, it studies transformations that are produced in sentences when translated into another language.

Thus, if the case of possessive adjectives indicated above is taken into account, it can be claimed that what occurs is that (6) and (8) refer to a different number of iconic possibilities. (6), or (7), can only be linked to one possibility:

(13)   Possible (he gave you her pencil)

However, because of the ambiguity of 'su' in Spanish, at least three iconic possibilities can correspond to (8): (13) and

(14)   Possible (he gave you his pencil, the possessor of the pencil being the subject of the sentence)
(15)   Possible (he gave you his pencil, the possessor of the pencil being somebody else who is male gender)

As said, (13) is the iconic possibility linked to (6), and (7), and hence it is also the iconic possibility that can be attributed to (8) if interpreted as (6), (7), or even (9) if 'k' represents a female gender person. On the other hand, (14) is the possibility to consider when (8) is understood as (10). Lastly, (15) would be the appropriate iconic possibility, for example, when the interpretation is akin to (9) and 'k', unlike what happens in (7), denotes a male gender individual.

Therefore, the theory of mental models can explain what can cognitively occur after processing expressions in natural language such as (6) and (8). It reveals that (8) is less informative because, as indicated, while (6) requires just one iconic possibility, (8) can require three.

Nevertheless, what happens in the case of 'pez', 'pescado', and 'fish' does not seem to be very different. In that case, Spanish is the more informative language, since (11) can only be related to one iconic possibility:

(16)   Possible (I have two fish that have been got from water)

And (12), on the contrary, can be linked to two possibilities. In addition to (16),

(17)   Possible (I have two fish that have not been got out from water)

As mentioned, this is so because 'fish' in English has the two senses: both when the animal is on and when it is off water. Accordingly, the theory of mental models can also describe in this case the mental process why and individual can note that (12) is more ambiguous than (11). Now, the former is the one that implies more iconic possibilities, and hence creates a greater level of uncertainty.

Conclusions

So, the theory of mental models can reveal the cognitive reasons why an apparently literal translation can be less informative than the original expression. The key is the number of iconic possibilities than can be assigned to each linguistic expression. When the number is not the same, two expressions cannot be just as informative. The one referring to more possibilities necessarily will point to more possible circumstances, and, therefore, will limit the characteristics of the fact, situation, or context being described in a lesser extent (to illustrate or support these theses, the arguments and ideas presented in papers such as, e.g., that of Orenes & Johnson-Laird, 2012, can be very relevant).

As pointed out, by reviewing the literature, one might note that the application of the theory of mental models to linguistics and its use to analyze recurring problems in that field can be very fruitful tasks. This paper appears to show one more aspect in which this is so. It produces that translations from a language into another one do not always are linked to the same possibilities, and that can be deemed as a criterion to indicated the degree of accuracy of translations. Thus, it can be assumed, for instance, that the closer the numbers of models of the expressions (the original and the translated ones) are, the more exact the translation will be.

In this way, this can be a better Spanish translation of (6):

(18)   Él te dio el lápiz de ella.

This is a better translation because 'de ella' expresses in Spanish both that the possessor of the pencil is somebody else and that that third person is female gender. Thus, 'él' ('he'), 'te' ('you'), and 'ella' ('hers') cannot be co-indexed:

(19) Él_i te_j dio el lápiz de ella_k.

And (19) shows that (18) is a better translation of (6) than (8) because it is akin to (9), or, even more clearly, to (7), which in turn means that it only refers to one iconic model: (13), that is, to exactly the same only possibility that can be assigned to (6).

Likewise, in the case of the meanings of 'fish' in Spanish, one might think that this is a better translation of (11):

(20)   I have two fish that have been fished.

Obviously, (20) only allows accepting (16) as an iconic possibility corresponding to it. So, it can be stated that (11) and (20) refer just to one model, and that that model is exactly the same. Undoubtedly, this can also be considered as a piece of evidence that (20) is a better option to translate (11).

Accordingly, the use of the theory of mental models can enable to identify when the translations are not absolutely exact and show the way to improve them. It is true that this can make the sentences more complex, since, by adding more words to them (clearly, (18) and (20) are sentences longer than (8) and (12) respectively), the final expressions can be harder to process. However, what is missing in this sense can be compensated by the accuracy of the resulting expressions.

Furthermore, this paper has addressed only two very simple examples. There is no doubt that all of this can be checked and tested with more complicated cases, as well as with grammatical constructions that are more abstract and difficult to understand. Perhaps it can be interesting to follow this theoretical path to see to what extent the potential of the theory of mental models can be useful. In this way, it cannot be forgotten, for example, that the proponents of this last theory have presented even computational programs trying to simulate the real manner people reason and make inferences (e.g., Khemlani et al., 2018). So, it can be thought that the theory of mental models could also provide some resources that, in the future, could be necessary for the translation softwares to work in a way increasingly more precise.

References

- Bucciarelli, M. & Johnson-Laird, P. N. (2019). Deontics: Meaning, reasoning, and emotion. *Materiali per una Storia della Cultura Guiridica, XLIX*(1), 89-112.
- Hornstein, N. (1987). *Logic as Grammar: An Approach to Meaning in Natural Language*. Cambridge, MA: The Massachusetts Institute of Technology (MIT) Press.
- Hornstein, N. (1995). *Logical Form: From GB to Minimalism*. Cambridge, MA, & Oxford, UK: Blackwell.
- Johnson-Laird, P. N. (2012). Inference with mental models. In K. J. Holyoak & R. G. Morrison (Eds.), *The Oxford Handbook of Thinking and Reasoning* (pp. 134-145). New York, NY: Oxford University Press.
- Khemlani, S., Byrne, R. M. J., & Johnson-Laird, P. N. (2018). Facts and possibilities: A model-based theory of sentential reasoning. *Cognitive Science, 42*(6), 1887-1924.
- Khemlani, S., Hinterecker, T., & Johnson-Laird, P. N. (2017). The provenance of modal inference. In G. Gunzelmann, A. Howes, T. Tenbrink, & E. J. Davelaar (Eds.), *Proceedings of the 39ᵗʰ Annual Conference of the Cognitive Science Society* (pp. 259-264). Austin, TX: Cognitive Science Society.
- López-Astorga, M. (2019). Language acquisition and innate cognitive abilities: An approach from the mental models theory. *Círculo de Lingüística Aplicada a la Comunicación (CLAC), 77*, 233-242.
- Orenes, I. & Johnson-Laird, P. N. (2012). Logic, models, and paradoxical inferences. *Mind & Language, 27*(4), 357-377.
- Quelhas, A. C. & Johnson-Laird, P. N. (2017). The modulation of disjunctive assertions. *The Quarterly Journal of Experimental Psychology, 70*(4), 703-717.