

Machine Translation Analysis of Chinese Dish Names

Xinyu Zhang, Olga Torres-Hostench

Abstract—This article presents a comparative study evaluating and comparing the quality of machine translation (MT) output of Chinese gastronomy nomenclature. Chinese gastronomic culture is experiencing an increased international acknowledgment nowadays. The nomenclature of Chinese gastronomy not only reflects a specific aspect of culture, but it is related to other areas of society such as philosophy, traditional medicine, etc. Chinese dish names are composed of several types of cultural references, such as ingredients, colors, flavors, culinary techniques, cooking utensils, toponyms, anthroponyms, metaphors, historical tales, among others. These cultural references act as one of the biggest difficulties in translation, in which the use of translation techniques is usually required. Regarding the lack of Chinese food-related translation studies, especially in Chinese-Spanish translation, and the current massive use of MT, the quality of the MT output of Chinese dish names is questioned. Fifty Chinese dish names with different types of cultural components were selected in order to complete this study. First, all of these dish names were translated by three different MT tools (Google Translate, Baidu Translate and Bing Translator). Second, a questionnaire was designed and completed by 12 Chinese online users (Chinese graduates of a Hispanic Philology major) in order to find out user preferences regarding the collected MT output. Finally, human translation techniques were observed and analyzed to identify what translation techniques would be observed more often in the preferred MT proposals. The result reveals that the MT output of the Chinese gastronomy nomenclature is not of high quality. It would be recommended not to trust the MT in occasions like restaurant menus, TV culinary shows, etc. However, the MT output could be used as an aid for tourists to have a general idea of a dish (the main ingredients, for example). Literal translation turned out to be the most observed technique, followed by borrowing, generalization and adaptation, while amplification, particularization and transposition were infrequently observed. Possibly because that the MT engines at present are limited to relate equivalent terms and offer literal translations without taking into account the whole context meaning of the dish name, which is essential to the application of those less observed techniques. This could give insight into the post-editing of the Chinese dish name translation. By observing and analyzing translation techniques in the proposals of the machine translators, the post-editors could better decide which techniques to apply in each case so as to correct mistakes and improve the quality of the translation.

Keywords—Chinese dish names, cultural references, machine translation, translation techniques.

I. INTRODUCTION

THANKS to the countless Chinese restaurants established over the years and on almost all the continents on earth, Chinese gastronomic culture are attracting increasing and better international acknowledgment. Chinese gastronomy is extremely rich not only for its delicacy, but also for its abundant

regional cuisines and numerous culinary techniques, which reflect the millenary Chinese culture in aspects of society, philosophy, traditional medicine, among others [1], [2], [6].

During the process of its propagation, for example, in the Hispanic world, the Spanish translation of the Chinese dish names has been inevitably required. However, the realization of this translation is difficult due to the huge cultural and linguistic difference between the West and China.

The denomination of the Chinese gastronomy depends on various factors. Some names are descriptions of the flavors and colors; others are related to historical characters or ancient anecdotes [2]. In this article, the authors will explain the major difficulties in this regard. In addition, the authors have carried out a comparative study of the Spanish translation of Chinese dishes with three MT tools: Google Translate, Baidu Translate and Bing Translator. A questionnaire was dedicated to MT users in order to find out which Chinese-Spanish outputs are preferred. Finally, the authors observed how these MT engines dealt with those specific translation difficulties [9].

II. DIFFICULTIES OF TRANSLATING CHINESE DISH NAMES

The denomination of the Chinese gastronomy includes a wide range of factors, which do not always correspond to the Western gastronomy. The equivalences of these elements in Spanish could be found in rare occasions, which make the Chinese dish names difficult to translate. Here the authors propose a classification of difficulties in the translation of Chinese dish names based on Zhou [2].

A. Ingredients

The difficulty of the translation of ingredients lies in the gastronomic exoticism, the distinct dietary habits and the use of the traditional medicinal herbs. For example, “豆腐” (*doufu*, *tofu* in English and Spanish), an ingredient exotic for the westerners, constitutes a common ingredient in Chinese cuisine. Another example, “枸杞” (*gouqi*, *goji berries* in English, *bayas de goji* in Spanish), one of the traditional medicinal herbs is often added in soups and stews for its rich nutrition

B. Colors, Aroma and Tastes

These three elements consist of the classic canon of the Chinese gastronomy, based on the combination of beautiful color, aromatic flavor, and delicate taste. For instance, “红烧牛肉” (*hongshao niurou*, *red-cooked beef* in English, *ternera roja y cocinada* in Spanish) is a traditional Chinese beef cuisine. The first Chinese character of this name means “red”, which refers to the color of this dish. In the name of another famous street snack, “臭豆腐” (*chou doufu*, *stinky tofu* in English, *tofu apestoso* in Spanish), the first Chinese character means *stinky* with reference to its unique flavor.

Xinyu Zhang and Olga Torres-Hostench are with the Department of Translation, Interpreting and East Asian Studies, Universitat Autònoma de Barcelona, 08193 Spain (e-mail: xinyu.zhang@e-campus.uab.cat, Olga.torres.hostench@uab.cat).

C. Forms

Chinese gastronomy pays high attention to the preparation of the ingredients before and after cooking. The ingredients are usually cut into various forms and sizes, and often placed in an aesthetic shape in plate. For example, the famous Chinese fish cuisine “松鼠鱼” (*songshu yu*, *squirrel mandarin fish* in English, *pez de ardilla* in Spanish), was denominated after its unique squirrel-shaped presence.

D. Culinary Techniques

The culinary techniques consist of the essence of the Chinese gastronomic art. More than 30 different techniques exist all over the country, which are frequently used in the gastronomic nomenclature. For example, the penultimate character of the most basic Chinese home cooking, “西红柿炒蛋” (*xihongshi chao jidan*, *stirfried egg and tomato* in English, *huevos revueltos con tomates* in Spanish) represents an original Chinese culinary technique *stir-fry*.

E. Cooking Utensils

The centennial Chinese kitchen and table utensils differ from the occidental ones. For instance, the prestigious “火锅” (*huo guo*, *hot pot* in English and Spanish) gains its name from its utensil: a metal pot.

F. Toponyms

The origins or representative locations of the dish are also used in the dish denomination. For example, in the name of the renowned “北京烤鸭” (*Beijing kaoya*, *Peking duck* in English, *pato laqueado a la pekinesa* in Spanish) China's capital name could be easily recognized.

G. Anthroponyms

The creators or related historical figures consist of another frequent element in the gastronomic nomenclature. One of the most famous dish overseas “宫保鸡丁” (*Gongbao jiding*, *Kung Pao chicken* in English, *pollo Kung Pao* in Spanish) is named after its creator Ding Baozhen.

H. Metaphors

The usage of metaphors constitutes the particular aesthetic way to describe the presentation of the dish figuratively. For example, the dish “狮子头” (*shizi tou*, *lion's head meatballs* in English, *albondigas cabeza de león* in Spanish) is consisted of large pork meatballs. The original Chinese name metaphorizes the meatballs into a lion's head.

I. Historical Tales

The most challenging factor of the translation appears when it comes to historical anecdotes, which normally are tales about the invention or origin of the food.

A traditional cuisine in Fujian Province “佛跳墙” (*fotiaoqiang*, *Buddha jumps over the wall* in English, *Buda saltando sobre una pared* in Spanish) consists of a stew prepared with a variety of rich ingredients: seafood, meat and vegetables. This classic nomenclature derives from different versions of historical stories. In one of those, this dish was

originally created by a governor from Qing Dynasty as “福寿全” (*fushouquan*), which means *good fortune* and *longevity*. Later on, it was gradually changed into “佛跳墙”, because that the pronunciation of the Fuzhou dialect sounded like the latter. Some Chinese restaurants name it as *steamed abalone with shark's fin and fish maw in broth*.

III. TRANSLATION TECHNIQUES

To solve the above mentioned difficulties, human translators might apply different translation techniques, such as the ones identified by Hurtado and Molina [5]:

- **Literal Translation:** To translate a word or an expression word for word. This technique could be used in most of the cases, except for those dish names with metaphors or historical tales, because of their implicitness. For instance, the name of a popular Sichuan dish “夫妻肺片” (*fuqi feipian*) literally means *husband and wife lung pieces*, while in fact it is made of thinly sliced beef and beef offal. So, using the literal translation technique would cause confusion.
- **Description:** To replace a term or expression with a description of its form or/and function. The description technique could also be frequently used. In spite of translating all the cultural elements in the names, describing the dish directly could bring simplification and clarity. The above mentioned dish “佛跳墙” (literally means *Buddha jumps over the wall*) could be translated into *stew of seafood, meat and vegetables* using this technique.
- **Amplification:** To introduce details those are not formulated in the source text: information, explicative paraphrasing. This technique could be used especially when it comes to the specific culinary techniques on account of its complicity. For example, the technique “红烧” could be amplified as *to braise or stew in soy sauce*, adding the main seasoning.
- **Generalization:** To use a more general or neutral term. The generalization could be applied in Chinese cooking techniques, as well as the specified ingredients. For instance, the culinary technique “煨” concretely refers to: First, boil the ingredient rapidly with water; second, put all the seasoning and spices into the water and boil it with high heat for a while; finally, cover the pot, turn the heat into soft fire and cook it for a long time until it is ready. As we can see, it would be much more convenient if we generalize it as *stew* or *braise*. Similarly, when it comes to an exotic ingredient, instead of looking for its scientific nomenclature, we could generalize it simply into *mushrooms* or *fish*.
- **Particularization:** To use a more precise or concrete term. This technique so far is only applied to specify an ingredient, which in most cases deals with meat. For example, the last character of the dish “东坡肉” means only *meat* in Chinese, however in fact, it is pork meat. This could explain the translation of the renowned *Dongpo pork*.

- Borrowing: To take a word or expression straight from another language. The borrowing is mainly applied to translate anthroponyms, toponyms and characteristic Chinese ingredients. As the above-mentioned dish “东坡肉” shows, the first two characters refer to its creator’s name, Dongpo. *Peking duck* and *tofu* are other typical examples of borrowing.
 - Adaptation: A shift in cultural environment, i.e., to express the message using a different situation. The adaptation also could be applied to translate the dish with clarity. For example, the literal meaning of “拍黄瓜” is *beat the cucumbers*, while actually it constitutes a cold dish made of cucumbers. It could be translated as *cucumber salad* using *salad* as an adaption. Reduction: To suppress a source text information item in the target text.
- In order to bypass the complex elements and convey the general meaning of the dishes, the application of the reduction technique is quite useful. For example, when it comes to a highly complex culinary technique, it could be reduced and only translated as the main ingredients.
- Transposition: To change a grammatical category. This technique could help to convey the complicated elements of the Chinese dish names. The famous “涮羊肉” is another common name for *Hot Pot*. “涮” is a Chinese culinary technique. Instead of interpreting this verb, the translation *hot pot* consists of a noun that indicates its cooking utensil [8].

IV. CULTUREMES AND OTHER INFLUENTIAL FACTORS IN CHOOSING THE TRANSLATION TECHNIQUES

A. Cultureme

The notion *cultureme* is being used in translation studies and other disciplines [3]. According to Molina [4], a cultureme is “un elemento verbal o paraverbal que posee una carga cultural específica en una cultura y que, al ser transferido a otra cultura, puede provocar una transferencia nula o distinta al original” [4, p.89]. (A verbal or paraverbal element that has a specific cultural burden in one culture, which could cause a null or distinct transfer from the original when it is translated into another culture). The classification of the cultural fields according to Molina is: “natural environment, cultural heritage, social culture and language culture [our translation]” [4, p. 92].

A large number of the elements of the Chinese dish names as discussed above constitute the culturemes themselves, which could be consigned to the cultural fields as the following:

- Natural environment: ingredients; colors, aroma and tastes; forms and toponyms. (Borrowing, generalization, literal translation)
- Cultural heritages: anthroponyms, cooking utensils and historical tales. (Borrowing, description, literal translation)
- Social culture: culinary techniques. (Generalization, amplification, adaptation, transposition, literal translation)
- Language culture: metaphors. (Description, amplification)

Different kinds of culturemes could be dealt with different techniques. In this article, we have proposed certain translation techniques that could be most possibly used regarding to each

kind of cultureme (as shown in parentheses above).

B. The Media and Target Groups

The media and the target groups influence the selection as well. For instance, the requirements for literary translation and the translation of a restaurant menu would be different. The former demands elegance, while the latter mainly aims to clarity and conciseness, which would lead to distinct choice of translation techniques.

V. METHODOLOGY

In order to compare the quality of the MT of Chinese gastronomic nomenclatures, in 2017 the authors translated 50 different Chinese dishes, which were selected according to different kinds of translation difficulties, with three MT tools: Google Translate, Baidu Translate and Bing Translator. Afterwards, the authors conducted a questionnaire to 12 digital Chinese users and asked them to choose their preferred MT [9].

All the participants are Chinese in their early 20s, and possess an undergraduate diploma of a Hispanic Philology major.

A. Analysis of the MT Output of Chinese Dish Names

TABLE I
SUMMARY OF USER PREFERENCES BY NUMBER OF THE DISHES AND PERCENTAGES

	Preferred Google Translation	Preferred Bing Translation	Preferred Baidu Translation	Total
<i>Number of dishes</i>	10	34	6	50
<i>Percentage</i>	20.00%	68.00%	12.00%	100.00%

According to the first table, the best engine which proposed the most preferred translations was Bing Translator. Table II below shows that Bing Translator was preferred in 306 selections, which corresponds to a percentage of more than 50%. However, after analyzing the MT output, it was very clear that in most cases the MT were very wrong.

TABLE II
NUMBER OF THE PREFERENCES IN TOTAL BY PARTICIPANTS

Machine translator	Number of the chosen preferences (600 in total, 50 dishes*12 participants)	Percentage
Google Translate	180	30%
Bing Translator	306	51%
Baidu Translator	114	19%

Interestingly, the authors have found that when the three options were all incorrect, in general, participants chose the one that reflected the main ingredient, despite the fact that the proposal was grammatically and semantically wrong. For example, the preferred MT of the dish “地三鲜” (*sautéed potato eggplants and green peppers* in English, *estofado de tres verduras* in Spanish) was *tres verduras* (*three vegetables* in English). The other two MT were *Sam Sun* and *los manjares de la tierra* (*the delicacies of the land* in English).

Sometimes, the participants opted for translations which were long and more descriptive, that is, translations with more information, even though they were totally incorrect. For

example, 41.7% of the participants preferred *fideos de mariscos surtidos* (noodles of a range of seafood in English) and another 41.7% chose *fideos de arroz con mariscos* (rice noodles with seafood in English) of the dish “三鲜米线” (rice noodles with three delicacies in English, *fideos de arroz de tres delicias* in Spanish). The remaining option is *Sam Sun fideos* (Sam Sun noodles in English).

Finally, the participants occasionally chose the translation that appeared more exotic, in which the technique of borrowing and adaptation could be observed. For instance, *pimiento Tiger Green* (pepper tiger green in English) is the preferred MT of “虎皮青椒” (*sautéed green peppers* in English, *pimientos verdes salteados* in Spanish). The other two options are *tigre de pimiento verde* (tiger of green peppers in English) and *tigre piel verde pimiento* (tiger skin Green peppers in English).

B. Analysis of the Translation Techniques Observed in the MT Output

The authors have analyzed the preferred MT in order to find

out which of the translation techniques could be observed in them. Sometimes, it could be difficult to judge, and sometimes more than one technique could be observed in one translation. When it comes to a terribly wrong translation, which no longer could be considered as a useful proposal, they were identified as FS (False Sense) and NSS (Not Same Sense), proposed by Orozco [7]. Those two are not translation techniques: the former means that the term or fragment has a very different meaning from the original text; the latter means that the translation presents something different from what the original text says, but not as different as the former. Table III presents a summary of our observation. Completing this table, we could see that the three most observed translation techniques in Google Translate are: literal translation, borrowing and generalization; in Bing Translator: literal translation, generalization and borrowing; and in Baidu Translate, literal translation, generalization and borrowing (reduction).

TABLE III
NUMBERS AND PERCENTAGES OF THE TECHNIQUES OBSERVED IN THE MT, AS WELL AS NUMBER OF FS AND NSS

Techniques	Google Translate		Bing Translator		Baidu Translate	
Literal Translation	29	58.00%	33	66.00%	20	40.00%
Description	5	10.00%	4	8.00%	3	6.00%
Amplification	0	0.00%	1	2.00%	0	0.00%
Generalization	6	12.00%	6	12.00%	10	20.00%
Particularization	1	2.00%	1	2.00%	1	2.00%
Borrowing	9	18.00%	6	12.00%	3	6.00%
Adaptation	4	8.00%	4	8.00%	5	10.00%
Reduction	4	8.00%	2	4.00%	5	10.00%
Transposition	0	0.00%	3	6.00%	2	4.00%
Errors						
NSS	8	16.00%	4	8.00%	13	26.00%
FS	7	14.00%	11	22.00%	11	22.00%
Total		30.00%		30.00%		48.00%

The literal translation was the most observed technique in all three MT tools. On the other hand, the amplification, particularization and transposition were observed in very few examples. Possibly because that the MT engines are at present limited to relate equivalent terms and offer literal translations without taking into account the whole context meaning of the nomenclature, which is essential regarding the application of the techniques mentioned above.

Another observation is that MT tools sometimes did not translate directly from Chinese to Spanish, but first from Chinese to English, and then English to Spanish. On account of this, some English borrowings appeared as proposals (intermediate language) such as *Sam Sun*, *pimiento Tiger Green*, among others.

Finally, cases of FS and NMS occurred with all three MT engines, which clearly show that the quality of the MT of Chinese gastronomic nomenclature is not yet satisfactory. Preposterous proposals like *de pepino* (of cucumber in English) and *llame al pollo de flor* (call the chicken flower in English), among others were proposed. Baidu Translate seemed to occupy a greater proportion than the two others in this matter.

VI. CONCLUSION

Chinese gastronomic nomenclatures could be seemed a priori easy to translate with machine translators because the vocabulary seems to be not so specialized (names of ingredients, culinary techniques, etc.). Nevertheless, a large number of cultural references are hidden in the Chinese dish names, which should also be reflected in the translations to varying degrees.

The post-editors should master the translation techniques and be able to observe how they appear in the proposals of the machine translators in order to decide which technique to apply, so that they could propose a high-quality post-edition. For instance, in the case of *pimiento Tiger Green*, the post-editors should firstly understand that this is a literal translation mixed with English. Then, they should be able to analyze the original Chinese name and find out that due to the metaphor element, the literal translation of this dish could not be understood in a foreign culture. Therefore, the post-editor would apply a translation technique in order to make it understandable. As mentioned above, the description would be adequate in this case. So it could be post-edited into *pimientos verdes salteados* (sautéed green peppers in English). Nevertheless, the MT of the

Chinese dish names could be an aid for tourists to have a general idea of a dish (to know the main ingredient), but It would be recommended not to trust in restaurant menus, TV culinary shows and so on and so forth.

ACKNOWLEDGMENT

This study was supported by the Spanish Ministry of Economy and Competitiveness. A Spanish State program for Research, Development and Innovation geared towards meeting challenges posed by society (Grant Number FFI2013-46041-R, ProjecTA-U project “Machine Translation Users”).

REFERENCES

- [1] J. Liu, *La cocina china*. Madrid: Popular, 2013.
- [2] J. Zhou, “Introducción a la compensación de las pérdidas en la traducción chino-español de los nombres de los platos chinos,” doctoral thesis, 2014.
- [3] L. Luque Nadal, “Los culturemas: ¿unidades lingüísticas, ideológicas o culturales?” *Language Design: Journal of Theoretical and Experimental Linguistics*, Special Issue, pp. 93–120, 2008.
- [4] L. Molina, “Análisis descriptivo de la traducción de los culturemas árabe-español”, 2001. Available: <https://www.tdx.cat/bitstream/handle/10803/5263/1mm1de1.pdf?sequence=1>. Accessed July 2018.
- [5] L. Molina, A. A. Hurtado, “Translation techniques revisited: A dynamic and functionalist approach,” *Meta: Journal des Traducteurs*, vol. 47, no. 4, pp. 498–512, 2002.
- [6] M. Holland, *El atlas comestible*. Translated by J. O. Aguilar, Barcelona: Roca Editorial, 2014.
- [7] M. O. Jutorán, *Metodología de La Traducción Directa del Inglés al Español*. 3. a ed. Granada: Comares, 2016.
- [8] S.Chang, *Interpretación de español*. 6th ed, Beijing: The Foreign Language Teaching and Research Press, 2012.
- [9] X. Zhang, “Traducción de los nombres de los platos chinos y su relación con herramientas de traducción automática,” 2017. Available: <https://ddd.uab.cat/record/188589>.

Xinyu Zhang (First author) was born in China. She obtained her Master's degree in Translation and Intercultural Studies from the Department of Translation, Interpreting and East Asian Studies of the Universitat Autònoma de Barcelona. She is currently a PhD student at the UAB, and also a member of the Tradumàtica Research Group. Her research interests include food-related translation, intercultural studies and machine translation.

Olga Torres-Hostench (BA and PhD in translation) is a Tenured Lecturer in Specialized Translation and Multimedia Localization at the Department of Translation, Interpreting and East Asian Studies at the Universitat Autònoma de Barcelona. She has contributed to several funded research projects on translation. She is a member of the Tradumàtica Research Group, and her current research interests focus on translation and technologies, machine translation postediting, and employability. Latest publications: Sakamoto, Akiko, Jonathan Evans, and Olga Torres-Hostench. "Translation and disruption." *Revista Tradumàtica: traducció tecnologies de la informació i la comunicació* 16, 2018; Torres-Hostench, O., Moorkens, J., O'Brien, S., & Vreeke, J. Testing interaction with a mobile MT post-editing app. *Translation & Interpreting*, 9(2), 138-150, 2017.