The Way to Define the Polysemic Words in a Chinese-English Dictionary

An Approach Based on the Generative Lexicon*

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Abstract—**This paper has carried out a study of the semantic extensions of the verb ài ('love') in Chinese from a sub-lexical perspective within the theoretical framework of Generative Lexicon. In particular, we have proposed a sub-lexical definition of the verb ài ('love') for a Chinese-English dictionary as a consequence of a lexicological analysis. Our results have indicated that taking the advantage of this semantic representation model, dictionary users are able to choose semantic structure based on the type of object that ài ('love') combined. This definition model can help foreign language learner to understand and use the verb thoroughly and flexibly.**

Keywords—lexicographic model; Generative Lexicon; lexical combination

I.   INTRODUCTION

Learning a foreign language involves several skills: for this reason, foreign language students usually follow classes in conversation, reading, writing, translation and other skills that enable them to learn the target language. All these competencies, of course, need a lexical flow to be exercised and developed. Therefore, it is imperative that students consult bilingual dictionaries to interpret the meaning of words they do not know and, in the case that the definition contains several meanings, select the appropriate meaning that fits the context. However, students have some difficulty in performing this task, that is, they find it difficult to find the appropriate meaning of a word according to the context, given that the most bilingual dictionaries only offer equivalent translations in the target language and deal with the different senses of a word with a static way, as if they were dissociated and not related from each other.

In line with the Generative Lexicon Theory (hereafter, GLT), words are not repertoires of specified meanings out of context. On the contrary, the words have minimal content features with the ability to display different meanings in interaction with the features of other words with which they are combined in different contexts (Batiukova and De Miguel, 2013: 440). Taking as an example the psychological verb ài ('amar') in Chinese, we will propose a definition

model for a Chinese-English dictionary within the model of GLT.

This paper is organized as follows: section 2 is devoted to a summary presentation on the Generative Lexicon Theory; in section 3 we show the entry ài ('love') in The Chinese-English Dictionary (2010), commenting on the problems it poses for its understanding and use; in section 4 we focus on describing the meaning of ài ('love') in lexicographic patterns adjusted to the theoretical model of the present paper and finally, in section 5 we conclude the work.

II.   THE GENERATIVE LEXICON THEORY

As De Miguel (2009) points out, whether the Generative Grammar Theory proposed by Chomsky in the 50s of the last century aims to answer the foundational question of how it is possible to obtain an infinite results from a finite number of resources, the basic proposal of Generative Lexicon Theory (Pustejovsky, 1995) is of the same type: the model basically tries to explain why a limited number of units with meaning stored in the human mind it allows us to unleash an infinite range of possible interpretations.

The GLT is a generative theory because it defends that the infinite meanings of words are generated from minimal semantic features by means of generative mechanisms. On the other hand, it is a compositional theory because it considers the context and the combination of words as responsible for lexical interpretation. Finally, the materialization of a minimum definition of a lexical unit in contextual composition gives an explanation for a widespread linguistic phenomenon: polysemy.

In the words of Cruse (2004) and Murphy (2010) (cited in De Miguel, 2014: 10), "the problem of polysemy can be approached from two fundamental perspectives". On the one hand, the relational models defend that the lexical pieces are polysemic and that their different meanings constitute separate entries in the mental lexicon. An example of the polysemic model is the proposal that represents the Theory of Sense-Text, for which the meaning of the Spanish word dedo as 'unit of measurement' and as 'part of {hand / foot}' constitute two different entries, with different categorical

behaviors and different syntactic behaviors (añadió un dedo de sal / curó el dedo del tenista) (De Miguel, 2014: 11).

On the other hand, the componential analysis considers that the lexical items are monosemic, and that their diverse interpretations depend on the context; therefore it is not necessary to codify in the lexicon the multiple senses of a word, since these are materialized in the context through the operation of lexical rules. Obviously the model proposed by Pustejovsky in The Generative Lexicon (1995) supports the monosemic stance, since it proposes an under-specified definition of words and assumes that the different senses materialize in the context. This model allows to account for the different interpretations presented in the predicates, such as the verb empezar, which combined with novel means "to start {to write / read it}" and with cake, "start to {cook it / eat it}" (both novel and cake are objects created through an event and intended to be used in another event). In fact, the polysemy enlightened with empezar is called, according to the GLT, logical polysemy, and constitutes the basic concern of this theoretical model. Another example that illustrates the logical polysemy would be the following:

(1) a. a good car

b. a good knife

c. a good meal

(Pustejovsky, 1995: 28)

The evaluative adjective good in (1) can accompany car and knife implying a positive assessment of its proper function ('car' for 'drive' and 'knife' for 'cut'); when it accompanies meal, it is polysemic and may refer to the 'food is rich' or the 'food is healthy'. On the other hand, meal can allude not only to food but to the event of eating: in this case, a good meal alludes to the fact that the 'eating event is pleasant'.

According to Pustejovsky (1995), the adjective *good* in (1) presents different meanings in the context because the under-specified internal structure gives it the ability to interact with the semantic features of another word when it enters a combination. Therefore, it seems impossible to list all the senses in the lexicographical definition. From this perspective, in the words of De Miguel (2009: 339), the lexicon does not constitute a static store of the senses but a dynamic, flexible and context-sensitive store. The basic objective of the Generative Lexicon model consists of accounting for polysemy based on the proposal that there is a minimum meaning and a possibility, governed by principles and generative mechanisms, to unleash multiple meanings in the context.

In shortly, within the GLT the meanings of a word cannot be enumerated in advance, but they manifest themselves in the context depending on the internal characteristics of the words with which it is combined. This paper intends to prove that this theoretical model could have an interesting consequence for lexicography.

III.   ÀI ('LOVE') IN THE CHINESE-ENGLISH DICTIONARY (2010)

The bilingual dictionaries usually offer translations of the lexical units of one language versus the units of another that have an equivalent lexical meaning. Because of the ease of consultation, the bilingual dictionary is one of the first aids to which the student of the foreign language normally attends, especially at the elementary levels. However, the bilingual dictionary isn't always satisfactory. Martín (1999: 15-16) points out that sometimes the bilingual dictionary makes reflection difficult on the part of the students, because the main function of a bilingual dictionary is the lexical decoding, which does not to provide enough information on the coding task.

Taking as an example the definition of the verb *ài* ('love') in *The Chinese-English Dictionary* (2010), we illustrate the problems posed by the lexicographical model that this dictionary has adopted:

(2) Definition of *ài* ('love') in *The Chinese-English Dictionary* (2010: 3):

爱(愛) ài
1. love, affection: 相~ fall in love / 爱父母 love one's parents / 我们~祖国。We love our country.
2. like; be fond of; be keen on: ~花 be fond of flowers / ~滑冰 like skatting
3. cherish; hold dear; take good care of; treasure
4. be apt to; be in the habit of: ~生气 have the habit of getting angry / 生铁~长锈. Cast iron is apt to rust.

As seen in (2), the definition of *ài* ('love') has four meanings in this dictionary. In comparison with other dictionaries that we have consulted, the definition presented in The Chinese-English Dictionary is relatively complete. When a foreign student wants to know the uses of *ài* ('love'), this dictionary provides almost all possibilities. In addition, the inclusion of concrete examples in each meaning is appreciated (which is not usual in bilingual dictionaries), so that users have a greater possibility of selecting the appropriate meaning that fits in the context, if *ài* ('love') appears in the same context or in similar contexts. For example, if the student wants to decipher the phrase tā ài yóuyǒng ('he + love + swim'), through the example that is included in the second meaning tā ài huábīng ('he + love + skate'), he is able to interpret the phrase as 'he like swimming'.

However, the students aren't always lucky enough to find an adequate example to help them understand the unknown word, for example, how can students interpret a phrase like tā ài tóuténg ('she + love + headache') without the inclusion of a similar example in the dictionary?

As with most bilingual dictionaries, the problem of translation affects the compression of users. For example, in the fourth meaning that the dictionary collects for *ài* ('love'), this verb indicates 'be apt to; be in the habit of'. The examples for this use are translated with different verbs: 'have the habit of getting angry' and 'Cast iron is apt to rust'. We suppose that these two translations of the verb *ài* ('love')

from Chinese to English will undoubtedly cause confusion rather than providing help to the users: if ài shēngqì ('love + get angry') is translated to English with the verb 'be in the habit of', understood as 'have the habit of getting angry', why the phrase ài shēngxiù ('love + get rust') can't be translated with the same verb? Maybe the English users know the lexical nuances that distinguish or approximate the verbs be apt to and be in the habit of, but the Chinese users don't have to know the distinction. Thus, when Chinese students consult the Chinese-English dictionary for translation, they are forced to ask if the phrase ài shēngxiù ('love + get rust') can be translated interchangeably with be apt to and in the habit of. If it is not, in what cases can we translate ài ('love') with be apt to and in which cases with be in the habit of?

Given the doubts that the representation of the meaning ài ('amar') can generate in (2), it seems appropriate to propose another lexicographical model for that verb.

IV. LEXICOGRAPHIC PROPOSAL OF ÀI ('LOVE') IN A CHINESE-ENGLISH DICTIONARY

A. The Semantic Content of the Verb Ài ('love')

Before proposing our lexicographical proposal for the verb ài ('love') in a Chinese-English dictionary, we have carried out a relatively exhaustive analysis of the verb ài ('love') from a sub-lexical perspective. We have analyzed their combinations by means of a sub-lexical analysis of the words that come in combination with the verb. As the data examined seem to confirm, the semantic extensions of ài ('love') are not random, but follow certain guidelines. The psychological verb ài ('love') has a minimal meaning ('feel a pleasant and intense emotion'), which intervenes in the creation of the different senses of the verb according to the sub-lexical features of the words with which it is combined. The different meanings that the verb can materialize arise from the coordination between the verbal content and the information contained in the form of semantic features (of the type [+ IN SITUATION OF RISK OR VULNERABILITY] OR [+ PROMINENT FUNCTION]) in the lexical entry of the core names that are built with it in the syntax.

By way of summary, "Table I" shows the meanings discriminated by our analysis in terms of the sub-lexical features of the words that intervene in the combination:

TABLE I.   THE MEANINGS DISCRIMINATED BY THE ANALYSIS IN TERMS OF THE SUB-LEXICAL FEATURES OF THE WORDS

Sub-lexical features	Meaning of *ài* ('love')	Translation of ài ('love') into English
[ENTITY] [+ ATTRACTIVE PROPERTIES] OR [+ AFFECTIVE LINK]	feel an intense and pleasant emotion towards someone / something because of their attractive properties or their affective bond	love; like
[ENTITY] [+ IN SITUATION OF RISK OR VULNERABILITY]	exert the action of keeping someone or something out of a problem or injury feeling an intense and pleasant emotion towards him	take good care of; protect
[ENTITY] [+ DIFFICULT TO OBTAIN]	feel intensely and pleasantly the desire to possess or achieve something	desire
[ENTITY] [+ SOCIAL RELATIONSHIP] [+ FUNCTION]	evaluate favorably how someone develops their function feeling an intense and pleasant emotion by doing it	appreciate
[ENTITY] [+ INSTITUTION] [+ RULES]	recognize the norms of an institution feeling an intense and pleasant emotion by doing it	respect
[EVENT] [+ AGENTIVE] [+ REPETITIVE]	feel a pleasant emotion when practicing the event	like doing; be in the habit of
[EVENT] [-AGENTIVE] [+ REPETITIVE]	occur frequently	frequently
[EVENT] [-AGENTIVE] [-REPETITIVE] [+ CHANGE OF STATE]	have a property	be apt to

In this way, when *ài* ('love') is combined with a name of [ENTITY] such as *fùmǔ* ('parents') or *lán* ('orchid') it means 'feel a pleasant and intense emotion' because the name has features like [+ATTRACTIVE PROPERTIES] or [+ AFFECTIVE LINK].

If the entity with which *ài* ('love') is combined has the feature [+ IN SITUATION OF RISK OR VULNERABILITY], the verb can mean 'take good care of', action derived from an intense and pleasant emotion (eg. *ài yǎnjīng* 'love + eyes / take care of the eyes'; *ài lǎorén* 'love + elderly / take care of the elderly').

When the verb is combined with a name of [+SOCIAL RELATIONSHIP] with a [+FUNCTION], what is 'loved' is its functionality, in the sense of 'positively evaluate the function that develops' (eg. *ài yuángōng* 'love + employee / appreciate the employees').

When the verb is combined with event names [+AGENTIVES] and [+REPETITIVES], *ài* ('love') means 'feel a pleasant emotion when practicing the event' (eg. *ài*

yóuyǒng 'love + swim / like swimming'). When the events lose the agentive character but are [+REPETITIVES], we get the meaning of 'occur frequently' (eg. *ài tóutòng* 'love + headache / have headache frequently'). Finally, when *ài* ('love') is combined with events neither agentive nor repetitive, but with the feature [+CHANGE OF STATE], the verb yields the predicative power to its complement, serving as support in the ascription of a property to the subject, such as a light verb or auxiliary periphrasis (eg. *tiě ài shēngxiù* 'iron + love + oxidize / iron is usually oxidized' > 'iron is oxidable').

Next, we proceed to propose a semantic representation model of verb *ài* ('love') in Chinese, as a consequence of a lexicological analysis in sub-lexical terms.

B. Semantic Representation Model

There are several projects that design their semantic representation based on the TLG 1 . Among them, the lexicographical model proposed by the Corpus Pattern Analysis (CPA)2 will be a basic model for the representation of the semantic behavior of *ài* ('love') in our Chinese-English dictionary. According to the assumption that words outside the context have no specific meaning but have a semantic potential whose different interpretations are made depending on the context, the CPA groups the patterns of use of the verbs and then analyzes them at syntactic and semantic level. Now, we illustrate the patterns that are collected for the verb toast in the CPA in "Table II":

TABLE II.　PATTERNS THAT ARE COLLECTED FOR THE VERB TOAST IN THE CPA

toast:
PATTERN 1: [[Human]] toast [[Food]]   Implicature: [[Human]] cooks [[Food]] by exposing it to radiant heat.
PATTERN 2: [[Human 1]] toast [[Human 2]]   Implicature: [[Human 1]] honours [[Human 2]] by the symbolic gesture of rising a glass of wine and then drinking a little of it.
PATTERN 3: [[Human 2]] <> {[[Event]] │ memory │ health │ success │ achievement}

In our opinion, this lexicographic model could represent the prototypical uses of polysemic words more clearly, because users can select the appropriate sense according to the type of word that appears in the pattern; on the other hand, the description of the predicate members, which is related to the encyclopedic concept (eg. human, food, health, etc.), is easier to understand. Therefore, we are going to use this model for our lexicographical proposal. Apart from representing the meaning of *ài* ('love') according to their usage patterns, we will also include in each meaning some

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examples that illustrate their contextual use. As for translation, as will be seen below, a meaning of *ài* ('love') may correspond to more than one equivalent lexical unit in English. Therefore, we will add some comments or explanations under each pattern in order to make clear what nuance exists between the possible equivalents of *ài* ('amar') in English. We think this part can facilitate the translation from Chinese to English for students of English as a second language3.

C. Definition of Ài ('love') in Subléxic Terms

爱 *ài* v.

- **PATTERN 1**: [[Human]] 爱 *ài* {[[Natural entity]] │ Human │ Family member │ Non-human entity} o [[Institution]]

  IMPLICATURE**:** [[Human]] feels a pleasant and intense emotion towards [[Natural entity]] or [[Institution]] because of its attractive properties or because of an affective bond

  EXAMPLE:

  1) 爱父母 ('love one's padres')

  2) 爱祖国 (l'ove one's country')

  EQUIVALENT: love; like

  COMMENT: when used to express the emotion pleasant a person feels towards another, *love* is often replaced by *like* in daily language. The use of *love* belongs mainly to literate and literary speech.

- **PATTERN 2**: [[Human]] 爱 *ài* [[Non-human entity]] o [[Artifact]]

  IMPLICATURE**:** [[Human]] feels a pleasant and intense emotion towards [[Non-human entity]] or [[Artifact]] because of its attractive properties

  EXAMPLE:

  1) 君子爱兰 ('Nobles like orchids')

  2) 独爱熊猫 ('Like only pandas')

  EQUIVALENT: like; love

  COMMENT: the verbs *love* and *like* can be substituted to explain the joy before a thing; but the translation with *love* implies an intensifying nuance, equivalent to 'like extraordinarily'.

- **PATTERN 3**: [[Human]] 爱 *ài* [[Entity at risk or vulnerability]]

  IMPLICATURE**:** [[Huma]] exercises the action of keeping someone or something out of a problem or injury by feeling an intense and pleasant emotion

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EXAMPLE:

1) 尊老爱幼 ('take good care of the elderly and the children')

2) 爱眼护齿 ('take good care of one's eyes and teeth')

3) 军爱民，民拥军 ('the army protects the people and the people support the army')

EQUIVALENT: take good care of; protect

COMMENT: both *take good care of* and *protect* indicate the act of keeping something or someone away from possible danger or damage; it is translated with the verb *protect* when the event needs greater implication of the subject to carry out this task.

- **PATTERN 4**: [[Human]] 爱 *ài* [[Institution]]

  IMPLICATURE**:** [[Human]] respects the rules of the [[Institution]] of which he is a member

  EXAMPLE:

  1) 爱国守法 ('respect the country and the laws')

  2) 爱党 ('respect the party')

  EQUIVALENT: respect

- **PATTERN 5**: [[Human 1]] 爱 *ài* {[[Human 2]] | Participant in a social relationship | Public figure} or {[[Abstract entity]] | character | virtue | quality}

  IMPLICATURE**:** [[Human 1]] recognizes the merit or value of [[Human 2]] or [[Abstract entity]]

  EXAMPLE:

  1) 爱敌人 ('esteem the enemy')

  2) 领导爱才 ('the directors appreciate the talent of their employees')

  3) 人民爱主席 ('the people admire the president of the country')

  EQUIVALENT: esteem; appreciate; admire

  COMMENT: *appreciate* and *esteem* can be replaced in common use to explain our emotion towards some person or something, recognizing its merit or value. It is translated with *esteem* when the event offers a more neutral connotation. *Admire* has a more intense meaning, in the sense of 'recognizing and judging a person as outstanding and extraordinary'; therefore, the translation with *admire* has an intensifying nuance.

- **PATTERN 6**: [[Human]] 爱 *ài* [[Luxurious entity]] or {[[Abstract entity | freedom | wisdom | property]]

  IMPLICATURE**:** [[Human]] is willing to own or achieve a certain thing

  EXAMPLE:

  1) 爱名车 ('desire luxurious car')

  2) 爱和平与自由 ('desire peace and freedom')

EQUIVALENT: desire; want

COMMENT: *desire* and *want* explain the will to achieve a thing that is not possessed. *Want* is more often combined with a more accessible object, whose achievement depends on the will and the means that the human uses; and *desire* supposes something whose possession depends less on the will or influence of the subject.

- **PATTERN 7**: [[Human]] 爱 *ài* {[[Event]] | daily activity | habit | custom} or [[Event that occurs]]

  IMPLICATURE**:** [[Human]] feels pleasant by doing the event or when the event occurs

  EXAMPLE:

  1) 爱运动 ('like playing sports (and do it frequently)')

  2) 爱哭 ('Like crying (and do it frequently)')

  EQUIVALENT:like

- **PATTERN 8**: [[Human]] or [[Physical entity]] 爱 *ài* [[Event that occurs]]

  IMPLICATURE**:** [[Event]] occurs frequently

  EXAMPLE:

  1) 爱头痛 ('have headache frequently')

  2) 爱迟到 ('arrive late frequently')

  EQUIVALENT: frequently

- **PATTERN 9**: [[Physical entity]] 爱 *ài* [[State change event]]

  IMPLICATURE**:** [[the change of state]] is a property of the [[Physical entity]]

  EXAMPLE:

  1) 铁爱生锈 ('the iron is apt to rust')

  2) 棉布爱起皱 ('the cotton fabric is apt to wrinkle')

  EQUIVALENT: be apt to; easily

V. CONCLUSION

In this paper we have tried to offer a lexicographical proposal of the definition *ài* ('love') in the Chinese-English bilingual dictionary, as a consequence of a lexicological analysis in sub-lexical terms. This proposed definition, which has adopted the semantic representation model of the CPA (*Corpus Pattern Analysis*), has allowed users to interpret the meaning of *ài* ('love') depending on the type of words with which it is combined in the context, what we believe should help the comprehension and reflection of this verb by the learners.

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