



Research Paper

Negative polarity items in Chinese existential sentences and application to machine translation

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ABSTRACT

Negation is crucial to semantics. Negative polarity items (NPI) play an important role in negation. We investigate the variety of negative polarity items which can be allowed in Chinese ESs and their licensing conditions. It is found that four types of negative polarity items can occur in Chinese ESs, that is, negative polarity adjectives, negative polarity adverbs, negative polarity wh-words, and negative polarity 'one' phrase as minimizer. In this study, we focus on the first two types of negative polarity items that can occur in Chinese ESs. The linguistic facts show that negative polarity adjectives in Chinese ESs can be licensed by negative sentences, yes-no interrogative sentences, A-not-A interrogative sentences, and the antecedent clause of a conditional while negative polarity adverb in Chinese ESs can only be licensed by negative sentences. We claim that negative polarity adjectives in Chinese ESs are strong NPIs while negative polarity adverbs remain weak NPIs. According to previous studies, it is often concluded that NPIs in Chinese are in general licensed by negative sentences. However, in our study we find that NPIs in Chinese ESs can also be licensed by other three types of sentences, that is, yes-no interrogative sentences, A-not-A interrogative sentences, and the antecedent clause of a conditional, as well as negative sentences. These are our new findings concerning NPIs in Chinese.

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INTRODUCTION

According to Collins English Dictionary, negative polarity refers to the grammatical property of a word or phrase, such as ever or any that may normally be used only in a semantically or syntactically negative or interrogative context. Words or expressions that either require or shun the presence of a negative element in their context are referred to as negative or positive polarity items (henceforth NPIs and PPIs), respectively. Often examples of NPIs in English are "any and yet", while "some and already" are instances of PPIs. Hoeksema (2006) thinks that many languages perhaps all, have NPIs and PPIs, and their distribution has been the topic of a rapidly growing literature since the seminal work of Klima (1964). Negative polarity items also occur in Chinese existential sentences, for example:

1. *Bingxiang limeiyourenhedongxi*- Refrigerator in not-have any thing
'There isn't anything in the refrigerator.'

Example (1) is an existential sentence, where 'renhe' is negative polarity item, occurring in a negative sentence, enhancing negative effect.

Existential sentence (henceforth ES) is a very special and important type of sentence in Chinese, which indicates something that exists in some place. Fan (1963) focuses on existential *zhe*-sentences, for example, 'Qing shangguazheyifuhua' (There is a picture on the wall). He divides existential *zhe*-sentences into A, B, C three parts, where A is a locative word, B is an existential verb with *zhe*

(a marker of progressive tense), C is the combination of a numeral, classifier and noun. He especially points out that part C is generally indefinite, but sometimes it does not repel definite noun. Huang (1987) thinks that existential you-sentences in Chinese can be represented as the general form of (NP)...V...NP...(XP), where NP is optional, V is filled by the existential verb 'you'(have), NP is the existent entity, XP is optional. The studies of NPIs run through the history of generative grammar. The empirical evidence across languages indicates that polarity is not only determined by syntactic categories, but also by semantic factors, involving the essence of grammatical structures and language knowledge. The traditional study on NPI licensing dates back to Klima (1964) who proposes a treatment whereby the presence of a morphosyntactic feature [affective] acts as the trigger of a negative polarity item. The affective environments include the scope of negation, comparative clauses, questions, the scope of negative quantifiers and adverbs, etc. Huang (1998); Huang (1999) and Progovac (1992) argue that NPI licensing shows significant similarities with syntactic binding. She thinks that an NPI is an anaphor which must be bound in its local domain. Dikken (2002) holds that at least some NPIs require syntactic agreement with a negative head in terms of minimalist feature checking. Ladusaw (1979) has proposed to eliminate the feature of [affective] by using a semantic account of the licensing of the polarity items. He points out that many of the contexts in which polarity items are acceptable have the property of downward monotonicity or implication reversal, for example, 'Mike is not a university student.' entails 'Mike is not a sophomore.'

Zwarts (1990), Nam (1994), and Van (1994) have argued that the typology of NPIs corresponds to a typology of 'monotone decreasing' operators. Specifically, weak NPIs are licensed by decreasing functions, strong NPIs are licensed by anti-additive functions, and strongest NPIs are licensed by anti-morphic functions. Cai (2010) argues that there is difference between 'renhe' and 'any' regarding licensing conditions and points out that Chinese 'renhe' is licensed by anti-additive operators. Chen (2015) argues that downward entailment (DE) approach better explains the polarity in Mandarin than the non-veridicality approach. She concludes that non-veridicality is neither a necessary nor a sufficient condition for NPI licensing in Chinese. However, negative polarity items in Chinese ESs are overlooked. Many issues concerning NPIs in Chinese ESs are worth exploring, such as the variety, the distribution, and the licensing conditions and how they interact on the three levels of syntax, semantics and pragmatics.

NEGATIVE POLARITY ADJECTIVES IN CHINESE EXISTENTIAL SENTENCES

According to Liu et al. (2015), Chinese 'renhe' (any) is an adjective but it cannot function as a predicate, so it may be called non-predicate adjective. 'Renhe' can only be used as a

modifier of nouns, but not a predicate or complement, for example:

2a. *Renhehouxuanrendouxing*-Any candidate all accept
'Any candidate is acceptable.'

b. **Houxuanren de fanweishirenhede*- Candidate DE range be any
*'The range of candidate is any.'

In example (2) a, 'renhe' is used as a modifier of noun 'houxuanren' (candidate), the sentence is acceptable. While in example (2) b, 'renhe' is used as a part of predicate, but the sentence is not acceptable. As a non-predicate adjective, 'renhe' can only be negated by 'fei'(non), rather than 'bu'(not), for instance, 'feirenhe' is acceptable but *'burenhe' is not. 'Renhe' is one of the most frequently used NPIs in Chinese ESs, whose counterpart is 'any' in English. Negative polarity adjective 'renhe' has negative sensitivity and it often occurs in a negative Chinese ES, which means something that is not existent. In this case it can only be used together with a negative marker in Chinese ESs. For example:

3. *Zhelimeiyounrenhe ren xiangchangge*-Here not-have any person want sing.
'There is no one who wants to sing here.'

From example (3), we can see that 'renhe' is used as a modifier of noun 'ren'(person), behind the Chinese negative marker 'mei (you)'. It is limited by the negative marker in syntactic structure, that is, 'renhe' must be c-commanded by a negative marker. Syntactically, the negative marker 'mei(you)' is the licenser of NPI 'renhe' in Chinese ESs. To compare:

4. * *Zhelirenhe ren xiangchangge*.- Here any person want sing.
*'There is any person who wants to sing here.'

In example (4), 'renhe' is still used as a modifier of noun 'ren', but it is not constrained by a negative marker 'mei(you)', so the sentence is not acceptable. However, in some other cases, even though there is not a negative marker in Chinese ESs, NPI 'renhe' can also be licensed a question sentence is a case in point, for example:

5. *Zheli you renhe ren xiangchangge ma?* - Here have any person want sing?
'Is there any person who wants to sing here?'

6. *Zheli you-mei-you renhe ren xiangchangge?* - Here have-not-have any person want sing?
'Is there any person who wants to sing here or not?'

In example (5), NPI 'renhe' is used as a modifier of the

existential noun 'ren', it is not constrained by a negative marker 'mei(you)', but it is used in a yes-no interrogative sentence with the Chinese question sentence marker 'ma'. This sentence is acceptable, which means NPI 'renhe' is licensed by the yes-no question sentence. In example (6), NPI 'renhe' is also used as a modifier of the existential noun 'ren', and it is licensed by the A-not-A interrogative sentence. According to Klima (1964), the presence of morphosyntactic feature of affective acts as a trigger of NPIs, a question sentence (including A-not-A question sentence) is one of the markers of affective environments. That is why example (5) and (6) can be accepted. Apart from a negative sentence, a yes-no question, A-not-A question, NPI 'renhe' can also be licensed by another kind of sentence, for example:

7. *Ruguo zheli you renheren xiangchangge, qinggaoshu wo*-If here have any person want sing please tell me
'If there is any person who wants to sing here, please tell me.'

In example (7), NPI 'renhe' used as a modifier of noun 'ren' in Chinese ES, which is introduced by 'ruguo' (if) constituting a conditional clause, followed by a main clause. This sentence is acceptable, that is, NPI 'renhe' is licensed by the antecedent clause of a conditional. Why is example (7) accepted? Klima (1964) thinks that the antecedent clauses of conditionals are markers of affective environments. Another similar example can be shown as below:

8. *Ruguo banli you renhe ren yaoji ena ben shu, qinggaoshu wo* - If class in have any person want borrow that CLF book, please tell me
'If there is any student in our class who wants to borrow that book, please tell me.'

Example (8) is an ES introduced by the marker of a conditional 'ruguo', NPI 'renhe' is licensed by the antecedent clause, which is a supposed proposition. However, if NPI 'renhe' occurs in the consequent clause of a conditional, it is not licensed. For example:

9. **Ruguo women ban de Zhangsanyaoji ena ben shu, qingmashang gaoshurenhe ren.*- If our class DE Zhangsan wants borrow that CLF book, please immediately tell any person
*'If Zhangsan in our class wants to borrow that book, please tell any person immediately.'

NPI 'renhe' in example (9) is used in the main clause of a conditional, but it is not licensed because the main clause is not a proposed proposition but a conclusion clause instead. In terms of semantic characterization, many of the contexts in which NPIs are acceptable have the property of downward entailment. Ladusaw (1979) makes such a proposal as: a negative polarity item is acceptable only if it is interpreted in the scope of downward-entailing

expression. He identifies the property of being 'affective' (licensing NPIs) with the property of downward-entailing. According to Ladusaw (1979), downward entailing can be defined as an expression is affective [= downward entailing] if it licenses inferences from supersets to subsets' (Linebarger, 1980). Logical semantic approach is adopted to discuss licensing conditions of NPI in this study. The two frequent contexts which can license NPIs are downward entailment and anti-additivity. Downward entailment context can be represented by using a logical formula as follow:

$$p \rightarrow q, \neg q \rightarrow \neg p$$

Anti-additivity context can be represented by using a logical formula as follow:

$$f(x \vee y) = f(x) \wedge f(y)$$

NPI 'renhe' in Chinese ESs may occur in a context of downward entailment. For example:

10a. *Zhelimeiyoudian* - Here not-have dictionary
'There are not dictionaries here.'

b. *Zhelimeiyouhanyingcidian* - Here not-have Chinese-English dictionary
'There is not a Chinese-English dictionary here.'

11. *Zhelimeiyourenhecidian*- Here not-have any dictionary
'There are not any dictionaries here.'

Example (10a) is a proposition with a superset of existential entity 'cidian' (dictionary), and the existential entity in example (10)b is a subset of 'hanyingcidian' (Chinese-English dictionary), so proposition (10)a entails proposition (10)b. Therefore, example (11) is a downward entailing context, in which NPI 'renhe' is licensed. Anti-additive environments are a proper subset of downward entailment contexts, and anti-morphic environments are a proper subset of anti-additive contexts. The antecedent clause of a conditional is anti-additive context, but the consequent clause does not conform to the requirement of an anti-additive function (Zwarts 1990; Zwarts, 1998; Van, 1994; Van, 1997). According to Zwarts (1990, 1998) a function f is anti-additive if for all x, y , in its domain, $f(x \vee y) = f(x) \wedge f(y)$. This can explain why example (7) and (8) are acceptable but example (9) is not. Anti-additivity of the antecedent clause of a conditional can be illustrated by the following examples:

12a. *Ruguo Zhangsanhuo Lisilajieshu, qinggaoshu wo*- If Zhangsan or Lisi come borrow book please tell me
'If Zhangsan or Lisi comes to borrow a book, please tell me.'

b. *Ruguo Zhangsanlajieshu, qinggaoshu wo, erqieruguo Lisi laijieshu, ye qinggaoshu wo.* - If Zhangsan come borrow

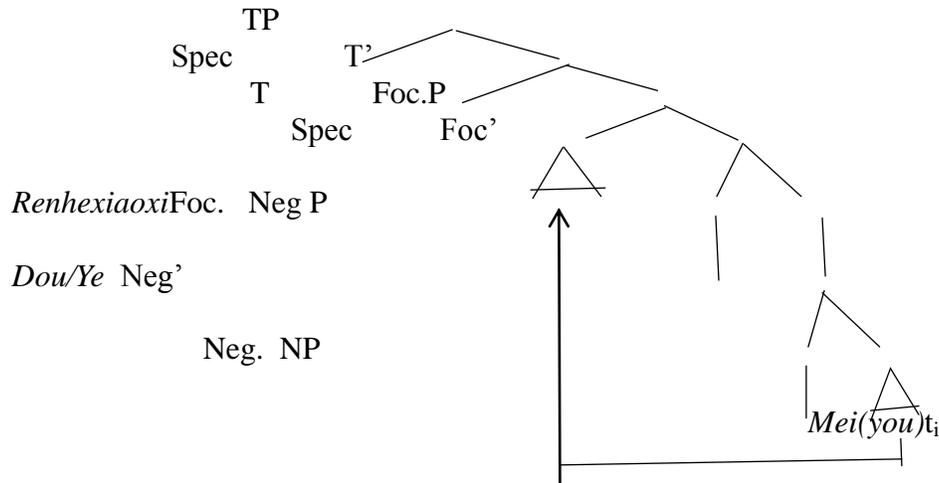


Figure 1: Tree diagram representing syntactic structure of 'renhe'

book please tell me and if Lisi come borrow book too please tell me
 'If Zhangsan comes to borrow a book please tell me and if Lisi comes to borrow a book please tell me, too.'

13. *Ruguo you renhe ren laijieshu qinggaoshu wo*-If have any person come borrow book please tell me.
 'If there is any person who comes to borrow a book, please tell me.'

Example 12a is the antecedent clause of a conditional, which has two arguments 'Zhangsan' and 'Lisi' joined by 'huo'(or). This conditional entails two cases expressed by example 12b, and the entailment is bidirectional and equal, characterizing with an anti-additive context. NPI 'renhe' is licensed in the antecedent clause of example (13), it shows that 'renhe' requires anti-additive environment to be licensed. Therefore, 'renhe' in Chinese ESs remains a strong NPI and its licensing requires anti-additive context. Based on the method used by Higginbotham (1996) and Cai (2010) shows that yes-no question sentence in Chinese can be a licensing context of NPI 'renhe', and yes-no question sentence and A-not-A question sentence both have semantic characterization of anti-additivity. In terms of pragmatic effect, NPI 'renhe' can be focalized by changing its syntactic structure from a postverbal position to a preverbal one with the concurrent occurrence of focus adverb 'dou' (all) or 'ye' (too) in Chinese ESs. For example:

14a. *Zhelimeiyourenhexiansuo* - Here not-have any clue.
 'There is not any clue here.'

*b. *Zhelirenhexiansuomeiyou* - Here any clue not-have.
 'There is not any clue here.'

c. *Zhelirenhexiansuodou/ye meiyou* - Here any clue DOU/YE not-have.

'There is not any clue at all here.'

In example (14a), NPI 'renhe' is licensed by the negative marker 'mei(you)', whereas in example (14b), 'renhe' and its modified noun 'xiansuo' (clue) are moved from the right to the left of the negative marker, but it is not licensed since this sentence is not acceptable. In example (14c), NPI 'renhe' is focalized, the existential entity 'renhexiansuo' (any clue) is moved from the right to the left of the negative marker 'mei(you)', together with the focus adverb 'dou' or 'ye'. To compare example 14b and 14c, it is observed that the focalization of NPI 'renhe' is allowed in a negative ES with the concurrent occurrence of focus adverb 'dou' or 'ye'. After NPI 'renhe' is focalized, its syntactic structure can be represented by using a tree diagram (Figure 1). Adjectives like 'jiandan' (easy), 'jiben' (fundamental), 'qima' (basic), 'hou' (last), 'jin' (near), etc. can also be used as negative polarity items in Chinese ESs, too. These negative polarity adjectives express the meaning of minimal degree, which often collocate with 'zui' (most), a marker of superlative degree in Chinese. However, these negative polarity adjectives usually collocate with a preposition 'lian' (even) and the focus adverb 'ye' (either) or 'dou' (all). 'Lian' and 'ye' or 'dou' are used together in the same construction, in which 'lian' introduces the focus of a contrastive topic, formulating the criterion of a contrast, often implying a more negative or affirmative meaning than the introduced criterion.

NEGATIVE POLARITY ADVERBS IN CHINESE EXISTENTIAL SENTENCES

The second type of negative polarity items which may occur in Chinese ESs is negative polarity adverbs. Negative polarity adverbs in Chinese ESs can be classified into negative polarity time adverbs and negative polarity degree

adverbs. We will mainly discuss the licensing condition of the time adverb *'shizong'* (throughout, from beginning to end). Many negative polarity time adverbs can be used in Chinese ESs, such as *'conglai'*, *'benlai'*, *'jiujiu'*, *'chichi'*, *'zaiye'*, *'qijin'*, *'muqian'*, *'ciqian'*, *'cong'*, *'zai'*, *'qi'*, etc., which are licensed differently in Chinese ESs, for example:

15. *Shizhongmeiyouxiaoxi* -Throughout not-have news
'There is not news throughout.'

In example (15), NPI *'shizhong'* is used in a negative sentence and the sentence is acceptable. NPI *'shizhong'* is licensed by the negative marker *'mei(you)'*, because c-commanding relations hold true between *'shizhong'* and *'mei(you)'*. NPI *'shizhong'* can also be used in an interrogative sentence, for example:

16. *Shizhong you wenti ma?* -Throughout have problem?
'Is there a problem throughout?'

In example (16), NPI *'shizhong'* is licensed by the interrogative sentence, meanwhile the existential entity is a concept which expresses negative implication 'problem'. If the existential entity is a semantically neutral concept, even though it is used in an interrogative sentence, NPI *'shizhong'* is not licensed, for example:

17. **Shizhong you xiaoxi ma?* - Throughout have news?
'Is there news throughout?'

In example (17), the existential entity *'xiaoxi'* (news) is a semantically neutral concept, although NPI *'shizhong'* is used in an interrogative sentence, it is not licensed. If the existential entity is a semantically positive concept, even though NPI *'shizhong'* is used in an interrogative sentence, it is not licensed, for example:

18. **Shizhong you haoxiaoxi ma?* -Throughout have good news?
'Is there good news throughout?'

In example (18), the existential entity is *'haoxiaoxi'* (good news), although NPI *'shizhong'* is used in an interrogative sentence, it is not licensed since the existential NP is a semantically positive concept. NPI *'shizhong'* can also be used in the antecedent clause of a conditional, for example:

19. *Ruguoshizhongyou wenti, qingmashanggaoshuwo*-If throughout have problem please immediately tell me
'If there is a problem throughout, please tell me immediately.'

In example (19), NPI *'shizhong'* is used in the antecedent clause of a conditional, at the same time the existential entity *'wenti'* (problem) is a semantically negative concept. The two conditions together guarantee the licensing of NPI

'shizhong' in Chinese ESs. If the existential entity is a semantically neutral concept as in the following example (20), in which *'xiaoxi'* is a neutral concept, although NPI *'shizhong'* is used in the antecedent clause of a conditional, it is not licensed.

20. **Ruguoshizhong you xiaoxi, qingmashanggaoshu wo.* - If throughout have news please immediately tell me
'*If there is news throughout, please tell me immediately.'

If the existential entity is a semantically positive concept as in the following example (21), in which *'haoxiaoxi'* is a positive concept, although NPI *'shizhong'* is used in the antecedent clause of a conditional, it is not licensed.

21. **Ruguoshizhong you haoxiaoxi, qingmashanggaoshu wo.*
- If throughout have good news, please immediately tell me
'*If there is good news throughout, please tell me immediately.'

In an interrogative sentence or the antecedent clause of a conditional, the existential entity should be a semantically negative concept, only these two conditions are satisfied, NPI *'shizhong'* can be licensed. As a matter of fact, this requirement is the reflection of a negative context in the aspect of meaning. NPI *'shizhong'* is licensed either in a negative context at the level of syntactic structure with a negative marker *'mei(you)'* or in a semantically negative context, in which the existential entity expresses a negative concept. In this way, NPI *'shizhong'* emphasizes the negative effect of a Chinese ES. However, in a comparative clause, how NPI *'shizhong'* is licensed varies, for example:

22. *Ou'er you wenti bi shizhong you wentihao.* - Occasionally have problem than throughout have problem better
'It is better to have a problem occasionally than to have problems throughout.'

23. *Shizhong you xiaoxibi meiyouxiaoxihao.* - Throughout have news than not-have news better
'It is better to have news throughout than not to have news.'

24. *Shizhong you dongli bi meiyoudonglihao.*- Throughout have motivation than not-have motivation better
'It is better to have motivation throughout than not to have motivation.'

Example (22), (23), and (24) are comparatives, but the existential entities in these three instances are different in terms of semantic contents. In example (22), the existential entity *'wenti'* (problem) is a concept which expresses negative contents NPI *'shizhong'* is licensed. In example (23), the existential entity *'xiaoxi'* (news) is a semantically neutral concept NPI *'shizhong'* is also licensed. In example (24), the existential entity *'dongli'* (motivation) is a concept

which expresses positive semantic contents NPI *'shizhong'* is also licensed. The three instances show that NPI *'shizhong'* can be licensed in a comparative clause regardless of the semantic contents of the existential entity. The affective attitude of semantic contents of the existential NP, whether it is negative, neutral or positive, does not influence the licensing of NPI *'shizhong'* in a comparative clause of Chinese ESs. According to Zwarts (1990, 1998), the antecedent clause of a conditional is anti-additive context, but the consequent clause does not conform to the requirement of an anti-additive function. Cai (2010) suggests that yes-no question sentences and A-not-A question sentences both have semantic characterization of anti-additivity. Therefore, negative polarity adverb *'shizhong'* is a strong NPI in Chinese ESs. In general, strong NPI *'shizhong'* is licensed by a syntactically or semantically negative sentence and emphasizes the negation in Chinese ESs. Interestingly when NPI *'shizhong'* is used in a comparative clause, it can be licensed by one of the three cases, whether the existential entity is a semantically negative, neutral, or positive concept. This aspect needs further investigation.

Other adverbs can also occur in Chinese ESs, such as *'conglai'*(at all times), *'qijin'*(up to now), *'muqian'*(at present), *'ciqian'* (before then), *'yizhi'*(always), and some single character adverbs like *'hai'*(yet), *'shang'*(yet), *'reng'*(still), which are all time adverbs, enhance negative effect in Chinese ESs. In addition, there are degree adverbs which can be allowed in Chinese ESs, such as *'yagen'er'*(at all), *'genben'*(thoroughly), *'yuanyuan'*(by far), *'wanquan'* (completely), *'juedui'*(absolutely), etc. On the one hand, their licensing conditions are similar to those that license the adverb *'shizhong'*(throughout); on the other hand, they vary accordingly. In Chinese ESs, it is common to find negative polarity adverbs collocate with another NPI in negative sentences, strengthening the negative effect, for example, *'genben'* and *'renhe'* may collocate with another negative polarity wh-word, for instance, *'shenme'*. The most emphatic way is to use three NPIs together in one existential sentence, for example, *'genben'*, *'renhe'* and *'yidian'er'* as in *'Genbenmeiyounrenheyidian'erxiansuo.'* (There is not any clue completely at all).

APPLICATION TO MACHINE TRANSLATION

The theory of Hierarchical Network of Concepts (HNC) (Huang, 1998) provides a new theoretical framework for interdisciplinary study of cognitive science, linguistics and artificial intelligence. According to this theory, there exists a space of concepts, which is the basis for human beings to recognize the world and for human thinking. Machine translation is a kind of mapping from one natural language space to another natural language space. After the analysis of source language and before the production of target version, intermediate processing steps are needed as a

transition. The intermediate transitional steps include two switches, two changes and two adjustments, that is, switch of type of sentence and switch of pattern of sentence, change of primary and secondary semantic chunks and change of formation of semantic chunk, adjustment of order of secondary semantic chunk and order of clauses (Huang, 1999). These transitional processing steps are necessary conditions of production of quality target version. The comprehension depth and breadth of source language knowledge will determine the quality of target version. Semantic chunk is a group of mixed semantic constituents, which is a lower level of semantic unit than a clause. Semantic chunks can be divided into primary semantic chunk and secondary semantic chunk. primary semantic chunks are necessary and major semantic constituents of a sentence, syntactically equivalent to a subject, verb and object while secondary semantic chunks are subsidiary and optional semantic constituents of a sentence, syntactically equivalent to an attribute, adverbial and complement.

Primary semantic chunks can be classified into global object chunk, GBK and eigen chunk, EK. Eigen chunk has a special status, because it has semantic content and usually determines a type of a sentence, syntactically equivalent to a predicate. Therefore it is crucial to understand a sentence correctly by judging a type of eigen chunk. The semantic chunk of negative marker and NPI and its modified noun belongs to eigen chunk. Among the nodes of concepts in accordance with the theory of HNC, some concept functions as preceding element, for example, the linguistic concept of negative marker "not" (meiyou), which can elicit its following element [NPI+N]. This eigen chunk can be translated into a verb and object construction. Since the order of verb and object construction is identical in Chinese and English, the order of translated version of the construction remains the same. In Chinese existential sentence, GBK "you" sentence corresponds to "there be" construction, EK "not+NPI+N" can be translated by choosing a semantic chunk and making necessary adjustment. Through a proper algorithm, the corresponding semantic chunks can be realized in machine translation. Through deepening the understanding of source language knowledge, the accuracy rate of Chinese-English machine translation can be improved.

CONCLUSION

The licensing conditions of NPI *'renhe'* and *'shizhong'* in Chinese ESs can be summarized in Table 1. The first type of NPIs which can occur in Chinese ESs is adjectives, such as *'renhe'*, *'jiandan'*, *'hou'*, etc. The negative polarity adjectives are mainly used as modifiers of the existential nouns, constituting a part of the existential noun phrase. The negative polarity adjective *'renhe'* in Chinese ESs is licensed by four contexts, negative sentences, yes-no interrogative sentences, A-not-A interrogative sentences, and the

Table 1: Summary of NPI 'renhe' and 'shizhong' in Chinese ESs

NPI	Distribution	Licensing Conditions
<i>Renhe</i>	modifier	negative sentences (license) interrogative sentences (license) A-not-A interrogative sentences (license) antecedent clause of a conditional (license)
<i>Shizhong</i>	adverb	negative sentences (license) interrogative sentences (negative subject) (license) A-not-A interrogative sentences (not license) antecedent of a conditional (negative subject) (license) a comparative clause (license)

antecedent clauses of a conditional. The negative polarity adjectives are licensed by negative sentences because they are c-commanded by the negative marker 'mei (you)'. The negative polarity adjectives are licensed by interrogative sentences (including A-not-A questions) and the antecedent clauses of a conditional because these two cases are both anti-additive contexts. The second type of NPI which can be allowed in Chinese ESs is adverbs, including time adverbs and degree adverbs, for instance, 'shizhong', 'qijin', 'wanquan', etc. The negative polarity adverbs in Chinese ESs are mainly employed as adverbials before the existential verb 'you', reinforcing negation from either a dimension of time or a dimension of degree. The licensing condition of negative polarity adverbs in Chinese ESs varies. NPI 'shizhong' is licensed by negative sentences. However, when NPI 'shizhong' occurs in yes-no interrogative sentences, A-not-A interrogative sentences, and the antecedent clauses of a conditional, it is licensed only when the existential noun expresses a negative concept. Interestingly, NPI 'shizhong' is licensed by a comparative of Chinese ESs whether the existential noun expresses a negative, neutral or positive concept. This aspect needs further research. The semantic chunk of negative marker and NPI phrase [not+NPI+N] can provide technological support for machine translation.

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