Discrepancy in English Speakers' L2 Acquisition of Chinese Wh-Words as Existential Polarity Words: The L1-Dependent Interface Hypothesis

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1. Introduction

Chinese wh-words are ambiguous; they can be used as existential polarity words (EPW), as in (2), as well as interrogative words, as in (1). As we know, English wh-words can only be used as interrogative words (except for wh-words used as relative pronouns).

(1) Ni xiang chi shenme (ne)? (*shenme* = an interrogative word)
you want eat what Q
'What would you like to eat?'

(2) Ta keneng diu-le shenme. (*shenme* = an existential polarity word (EPW))
he probably lost-PFV what
'He has probably lost something.'

It has been argued (cf. Huang 1982; Li 1992; Lin 1998) that Chinese wh-words used as EPWs have to be licensed and are subject to both syntactic and semantic restrictions. Semantically, EPWs must fall within a context where the proposition containing the EPW is a non-fact or the truth value of the proposition is not positively fixed in a definite manner. Syntactically, EPWs must occur in the c-commanding scope of their licensors.

2. Wh-words used as existential polarity expressions in Chinese

2.1 Negator bu*(not)/*meiyou*(did not) used as licensors for EPWs*

Let us first look at examples of negation used as licensors for EPWs in Chinese. Semantically, a negative sentence meets the requirement for non-fact, as in (3). The licensor for the EPW is the negation *meiyou* "didn't", which c-commands the EPW *shenme ren*. As the sentence meets both the semantic and syntactic requirements, the sentence is grammatical. However, in (4), although it is also a negative sentence, the EPW *shenme ren* is not c-commanded by the licensor *meiyou* "didn't", which leads to ungrammaticality of the sentence.

(3) women meiyou kanjian shenme ren.
we not see what person
'We didn't see anybody.'

(4) *shenme ren meiyou kanjian women.
what person not see us
'Somebody didn't see us.'

2.2 Conditional words like ruguo *(if) used as licensors for EPWs*

Similarly, a conditional clause headed by *ruguo* "if" is hypothetical in meaning and its truth value is not fixed in a definite manner. Therefore it meets the semantic requirement. In (5) and (6), the EPWs,

 Proceedings of the 9th Generative Approaches to Second Language Acquisition Conference (GASLA 2007), ed. Roumyana Slabakova et al., 272-284. Somerville, MA: Cascadilla Proceedings Project.

shenme dongxi “something” and *shenme ren* “somebody” are in object and subject positions of the conditional clause respectively, and they are c-commanded by *ruguo* “if”, which is assumed to be in the head C^0 of the conditional clause. As they meet both the syntactic and semantic requirements, the EPWs in (5) and (6) are properly licensed and the sentences are grammatical. However, the EPW *shenme ren* “somebody” in (7) is in subject position of the matrix clause, which is not c-commanded by *ruguo* “if”, resulting in ungrammaticality of the sentence.

(5) Ruguo women nonghuai-le shenme dongxi, laoshi hui hen shengqi.
if we damage-PFV what thing teacher will very angry
‘If we damage something, the teacher would be very angry.’

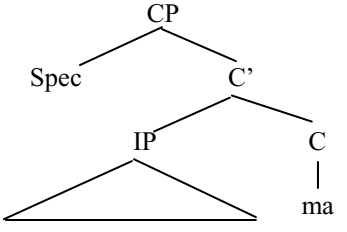
(6) Ruguo shenme ren nonghuai-le jisuanji, laoshi hui hen shengqi.
if what person damage-PFV computer teacher would very angry
‘If somebody damages the computer, the teacher would be very angry.’

(7) *Ruguo women nonghuai-le jisuanji, shenme ren hui hen shengqi.
if we damage-PFV computer what person would very angry
‘If we damage the computer, someone would be very angry.’

2.3 Yes-no particle ma *as a licensor*

It is assumed that the Chinese yes-no particle *ma* is generated in the head of CP. As shown in (8), the c-commanding scope of the yes-no particle is the whole IP, including both the subject and the object. This makes it possible for the EPW to occur in either subject or object position in Chinese yes-no questions, as shown in (9) and (10). As it is a question, the truth value of the proposition is obviously still undecided, and therefore the wh-word in the question meets the semantic requirement for EPWs.

(8)



(9) Ni xihuan shei ma?
you like who Q
‘Do you like anybody?’

(10) Shei xihuan ni ma?
who like you Q
‘Does somebody like you?’

2.4 A-not-A as a licensor

In Chinese, there is a different way of forming a yes-no question. Instead of using the yes-no particle *ma*, one can put the negation *bu* “not” or *mei* “didn’t” between a verb and a reduplication of the verb, or between the first syllable of the verb and the full version of the verb, as in *ren-bu-renshi* “know-not-know” in (11). EPWs in object position of A-not-A questions can be licensed, as in (11), but not in subject position, as in (12). This is because the object position, but not the subject position, falls within the c-commanding domain of the A-not-A. However, if A-not-A appears in the initial position of the sentence, the subject EPW can be properly licensed, as in (13).

(11) Ni ren-bu-renshi shei?
you know-not-know who
'Do you know anybody?'

(12)*Shei ren-bu-renshi ni?
who know-not-know you

(13) Shi-bu-shi shei renshi ni?
Be-not-be who know you
'Does somebody know you?

2.5 Adverbs of uncertainty as a licensor

Chinese adverbs expressing uncertainty include *keneng* "possibly", *yexu* "perhaps", *dagai* "probably", etc. As these adverbs can create contexts where the force of asserting the truth of a proposition is lessened or not firmly fixed, they function as licensors for EPWs, as in (14), where the wh-word *shenme* is c-commanded by the adverb *keneng* "possibly". However, it is ungrammatical if the wh-word appears in a position not c-commanded by the adverb, as in (15).

(14) Li Ming keneng diu-le shenme.
Li Ming possibly lose-PFV what
'Li Ming has probably lost something.'

(15)* Shenme ren keneng lai-le.
somebody possibly come-PFV
'Somebody has probably arrived.'

2.6 Inference -le *as a licensor*

As can be seen in (16) and (17), the sentence-final particle *-le* is used to indicate that one is making inference on the basis of circumstantial evidence rather than making a firm claim about the truth of the proposition. It is assumed that the sentence-final particle *-le* is generated in the head of CP, i.e. the same position of the yes-no question particle *ma* (see the diagram in (8)), which c-commands both the subject and the object of the sentence, and therefore EPWs can appear in either position in this context. As we can see, the speaker of (16) and (17) is just guessing with a degree of certainty, but the truth value of the proposition is still not fixed in a definite manner.

(16) (Noticing that Zhang Hong is going out with a man every weekend, Zhang Hong's father says to his wife:)
Zhang Hong aishang shenme ren le.
Zhang Hong fall in love what person PART
'Zhang Hong seems to have fallen in love with someone.'

(17) (Noticing that a man rings to invite Zhang Hong out every weekend, Zhang Hong's father says to his wife:)
Shenme ren aishang Zhang Hong le.
What person fall in love Zhang Hong PART
'Someone seems to have fallen in love with Zhang Hong.'

2.7 Non-factive verbs as a licensor

As shown in (18) and (19), non-factive verbs refer to those verbs, such as *renwei* "to think", *huaiyi* "to suspect", and *cai* "to guess", which express the speaker's belief and assumption of the truth of a proposition. Non-factive verbs also refer to those verbs, such as *jiazhuang* "to pretend" and *(hai…) yiwei* "mistakenly thought", which presuppose the falsity of their complement clause. Non-factive verbs only indicate subjective assessments but not the objective reality, and the subject position in Chinese cannot be c-commanded by the verb, and therefore EPWs are not allowed in subject position in this context.

(18) Wo renwei ta tou-le shenme dongxi.
I think he steal-PFV what thing
'I think he has stolen something.'

(19) Ta hai yiwei shenme ren diu-le shoubiao.
he still thought what person lose-PFV watch
'He mistakenly thought that someone had lost his/her watch.'

3. Contexts where wh-EPWs are not allowed

It should be noted that there are many contexts in Chinese which do not allow wh-EPWs. These include simple affirmative sentences, as in (20), wh-questions, as in (21), VP-complements to factive verbs, such as *houhui* "to regret", *aonao* "to be annoyed", as in (22), etc. In addition to factive verbs, some adverbial clauses such as those introduced by *yinwei* "because" and *suiran* "although" usually have their truth taken for granted, and therefore, in these clauses wh-EPWs are not sanctioned, as shown in (23) and (24).

(20)* Li Ming diu-le shenme.
Li Ming lose-PFV what
'Li Ming lost something.'

(21) Tamen bu renshi shei (ne) ?
they not know who Q
*'They don't know anybody.'
'Who do they not know?'

(22)* Wo baoyuan ta tou-le shenme dongxi.
I complain he steal-PFV what thing
'I complain he has stolen something.'

(23)* Yinwei shei mei jiao zuoye, suoyi laoshi hen shengqi.
because who not hand in assignment therefore teacher very angry
'Because someone did not hand in his assignment, the teacher was very angry.'

(24)* Suiran shenme ren bu xihuan Wang Xiaojie, women que hen xihuan ta.
although what person not like Wang Miss we but very like her
'Although someone does not like Miss Wang, we like her very much.'

It is clear from the above examples that the interpretation and the use of Chinese wh-words used as EPWs involve the semantic-syntax interface. Their distributions are affected by a complex set of seemingly unrelated factors. Semantically, EPWs occur in contexts where the truth value of the proposition is negated, non-fixed, asserted with uncertainty, or inferred tentatively. They do not occur in contexts where the truth value is positively asserted in a definite manner. According to Li (1992), it is the lack of definitely asserting the truth of a proposition that makes a wh-EPW available in Chinese.

Syntactically, an EPW requires a licensor and must be c-commanded by it. As far as lexical meanings are concerned, EPWs can be positive polarity items (e.g. *some*-) as well as negative polarity items (e.g. *any*-).

4. Empirical Study

Studies in the L2 literature have shown that L2 interface causes problems. Recently, Sorace and Filiaci (2006) have proposed that grammatical aspects that involve an interface between syntax and other cognitive domains may not be acquirable in L2 acquisition. This leads to research questions in our study reported here: Will English-speaking learners of Chinese be able to acquire the syntax-semantics interface concerning Chinese EPWs and their licensors? Are all the EPW licensors acquirable in L2 Chinese?

4.1 Subjects

To answer these questions, an empirical study was conducted involving 107 English speakers and 20 native speakers of Chinese as controls. The English informants were students, lecturers and professors of Chinese from universities in the U.K. On the basis of their performance in a Chinese cloze test, the learners were divided into five Chinese proficiency groups respectively. Information about each of the 6 groups is given in Table 1.

Table 1. *Information about each group*

Groups	*No. of subjects*	*Average Age*	*Average months of studying Chinese*	*Average months in China/Taiwan*	*Mean scores in the cloze test (total=40) (ranges in brackets)*
English Beginner	20	22	4	1	4 (1-6)
English Post-beginner	20	23	10	3	11 (7-15)
English Intermediate	28	22	29	6	22 (16-25)
English Post-intermediate	25	27	83	18	30 (26-34)
English Advanced	14	36	207	44	36 (35-39)
Native Chinese	20	28	N/A	N/A	39 (38-40)

A one-way ANOVA shows that there is a significant difference between groups in their performance in the cloze test (F=(10,227)702.219, p<0.001). The post-hoc Tukey tests indicate that except for the English Advanced Group, all the other learner groups are significantly different from the native Chinese Group.

4.2 Acceptability Judgment Test

Each informant was asked to do an acceptability judgment test, which included 7 categories and 24 sentence types, as shown in Table 2. Each type had four tokens and in total, 96 sentences concerning licensors for Chinese wh-EPWs were included in the test.[1]

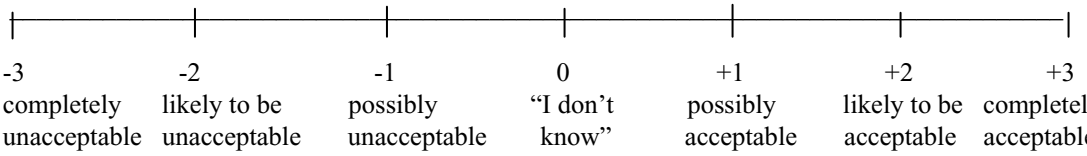
[1] There are also other types of sentences testing different aspects of L2 Chinese grammars, which will be reported elsewhere. These different types of sentences also serve as distracters.

Table 2: Categories and types of test sentences in the Acceptability Judgment Test

Categories	**Sentence types**
1. Negators	Negator + obj-EPW vs. *Subj-EPW + nagator vs. Control negator
2. Non-factive verbs	N-factV + EPW vs. Control N-factV vs. *FactV + EPW vs. Control FactV
3. Uncertainty adverbs	Un-adverb + EPW vs. *EPW without un-adverb vs. Control un-adverb
4. "If"	EPW in if-clause vs. *EPW not in if-clause vs. Control "if"
5. Yes-no particle *ma*	Obj-EPW + *ma* vs. Subj-EPW + *ma* vs. Control- *ma*
6. Inferential *-le*	Obj-EPW with *–le* vs. Subj-EPW with *–le* vs. *Obj-EPW without *–le* vs. Subj-EPW without - *le* vs. Control-*le*
7. *A-not-A*	*A-not-A* + obj-EPW vs. *Subj-EPW + *A-not-A* vs. Control *A-not-A*

In each category, there is a control sentence and experimental sentences. The control sentence and its corresponding experimental sentences are the same in terms of the sentence structure and vocabulary used except that the former does not have any wh-EPW but only has a potential EPW licensor while the latter has both. The difference between the experimental sentences is the position of the EPW in relation to the potential licensor. All test sentences were randomised and presented in Chinese characters, but all instructions were given in English. Informants were asked to judge the acceptability of each sentence by circling a number on a scale as given in (25). We treat any score of "+1" or above that the informant assigns to a particular sentence as a sign of accepting that sentence, and conversely any score of "-1" or below as a sign of rejecting that sentence. The score of "0" is treated as a sign that the informant is not sure.

(25)



In the test sentences, we only used Chinese wh-arguments, such as *shei* "who" and *shenme* "what" rather than wh-adverbs or wh-adjuncts such as *shenmeshihou* "when", *nali* "where", *zenmeyang* "where" and *weishenme* "why". This is because behaviours of wh-arguments are found to be relatively stable in L2 Chinese (cf. Yuan 2007) and therefore, are more appropriate for testing licensing power of potential EPW licensors in L2 Chinese.

4.3 The results

Table 3 presents results of judgment of Chinese negative sentences with the EPW embedded in object and subject positions (i.e. experimental sentences) and sentences with only the negator but without any EPW (i.e. control sentences). As shown in the fourth column of the table, the mean scores of all groups are above +1, a sign of acceptance of the control sentences. Results of post-hoc Tukey tests, which follow a one-way ANOVA (F=(10,227)10.785, p<0.001), indicate that except for the English Beginner Group, no learner group is significantly different from the NS Group in accepting the control sentences, which suggests that these learner groups have acquired the native-like use of Chinese negators *bu* "not" and *mei(you)* "did not/ have not" in the sentences involved.

Table 3: Mean scores of judgment of wh-EPWs in negative sentences

	Negation + obj-EPW	*Sub-EPW + Negation	Control negation
EB Group	-0.40†	-0.93†	1.69†
EPB Group	0.73†	0.34†	2.64
EI Group	0.73†	-0.11†	2.70
EPI Group	1.59	-0.99	2.79
EA Group	1.67	-2.13	2.75
NS Group	2.52	-2.49	2.85

† = significantly different from the NS Group

However, when an EPW appears in the object position, the EB, EPB and EI groups' judgment becomes indeterminate, as shown in the second column in Table 3, and their mean scores fall between –0.4 to 0.73, failing to give any clear indication of acceptance (i.e. +1 or higher) or rejection (i.e. –1 or lower) of these grammatical sentences. Results of post-hoc Tukey tests, which follow a one-way ANOVA (F=(10,227)6.308, p<0.001), show significant differences between these groups and the NS Group in judging the grammatical Chinese sentences in which an EPW in object position is c-commanded by a negator. When the EPW appears in the subject position of the negative sentence, where the EPW is not c-commanded by the negator, these groups fail to reject these ungrammatical sentences as well, as shown in the third column in Table 3. Results of post-hoc Tukey tests, which follow a one-way ANOVA (F=(10,227)7.699, p<0.001), show significant differences between EB, EPB and EI Groups and the NS Group in judging these ungrammatical sentences. One-way ANOVAs are also conducted to compare the three types of test sentences involving the EPW and the negator, i.e. Negator + obj-EPW vs. *Subj-EPW + negator vs. Control negator, in each group's judgment. Results of the post-hoc Tukey tests show no significant difference between the grammatical "Negator + obj-EPW" sentence and the ungrammatical *"Subj-EPW + nagator" sentence in the judgment of the EB, EPB and EI Groups, which suggests that no licensor-licensee relationship is established between the negator and the EPW in these groups' L2 Chinese grammars because it does not make any significant difference whether the EPW is c-commanded by the negator or not in these groups' judgment. In contrast, the EPI and EA groups, like the NS group, have a clear distinction between the grammatical sentence with the EPW in the object position c-commanded by the negator and the ungrammatical sentence with the EPW in the subject position not c-commanded by the negator, as they accept the former and reject the latter.

Recall that non-factive verbs can serve as a licensor for wh-EPWs in Chinese but factive verbs cannot. This can be seen in the NS Group's mean scores in Table 4; they accept sentences with a non-factive verb in the matrix clause and with an EPW in the complement clause (mean score = 2.29), and at the same time they reject sentences with a factive verb in the matrix clause and with an EPW in the complement clause (mean score = -1.13). In post-hoc Tuckey tests following two respective one-way ANOVAs comparing the different groups' judgment of each of the two control sentences (Control non-factive verb: F=(10,227)7.147, p<0.001; Control factive verb: F=(10,227)5.219, p<0.001), no significant difference is found between the NS Group and any learner group. This implicates that all learner groups have native-like competence in handling the control sentences. However, except for the English Advanced Group, all the other learner groups are found significantly different from the NS Group in judging the grammatical sentence in which the EPW is licensed by a non-factive verb (F=(10,227)5.842, p<0.001). This suggests that the licensor-licensee relationship between the non-factive verb and the EPW is available in advanced learners' L2 Chinese grammars (i.e. the EA Group) but not in other groups' L2 Chinese grammars.

Table 4: Mean scores of judgment of wh-EPWs in complement sentences of factive and non-factive verbs

	N-factV + EPW	Control N-factV	*FactV + EPW	Control factV
EB Group	-0.30†	1.24	-0.34	1.49
EPB Group	0.54†	1.89	0.44†	1.61
EI Group	0.48†	2.35	0.00	2.20
EPI Group	0.52†	2.49	-0.38	2.15
EA Group	1.86	2.34	-1.13	1.77
NS Group	2.29	2.36	-1.13	2.16

† = significantly different from the NS Group

The analysis above is supported by results of Tukey tests, which follow one-way ANOVAs comparing all the sentences types involving factive and non-factive verbs in each group's judgment; there is no significant difference between the grammatical "non-factive verb + EPW" sentence and the ungrammatical "factive verb + EPW" in the judgement of the learner groups, except for the English Advanced Group. This suggests that the use of a factive or a non-factive verb in a sentence in earlier stages of L2 Chinese grammars does not affect the grammaticality status of the EPW in the sentence. As we can see in Table 4, most mean scores of beginner, intermediate and even post-intermediate groups' judgment of the experimental sentences fall in an indeterminacy range of +1 and –1, whether a factive verb or a non-factive verb is used in the sentence. The Advanced Group, like the NS Group, are able to distinguish the grammatical sentence with a non-factive verb licensing an EPW from the ungrammatical sentence with a factive verb c-commanding an EPW.

The data in Table 5 show that in judging the control sentences involving uncertainty adverbs, the mean scores of all learner groups are above +1. However, in judging the grammatical sentence with an EPW c-commanded by an uncertainty adverb, all learner groups, except for the Advanced Group, are found significantly different from the NS Group (see the second column in Table 5) in Tukey tests following a one-way ANOVA (F=(10,227)7.135, p<0.001). This suggests that availability of an uncertainty adverb in the sentence does not affect the grammaticality status of the EPW in these groups' L2 Chinese grammars. This is confirmed by results of Tukey tests comparing the three types of sentences involving uncertainty adverbs in each group's judgment; no significant difference is found between the grammatical sentence with an EPW c-commanded by an uncertainty adverb and the ungrammatical sentence with an EPW but without any c-commanding uncertainty adverb in the judgment of the English beginner, intermediate and even post-intermediate groups. This implicates that these groups of learners are unable to make a distinction between the grammatical sentence and the ungrammatical sentence. It seems that it is not until a very advanced level (i.e. the level of the Advanced Group) that a licensor-licensee relationship is established between the uncertainty adverb and the EPW in L2 Chinese grammars. The Advanced Group, like the Native Chinese Group, accept Chinese sentences with the EPW c-commanded by an uncertainty adverb and reject Chinese sentences with the EPW but without any uncertainty adverb, which shows that the availability of an uncertainty adverb in the sentence can affect the grammaticality status of the EPW in advanced learners' L2 Chinese grammars.

Table 5: Mean scores of judgment of wh-EPWs in sentences with an uncertainty adverb

	Uncertainty adverb + EPW	*EPW without uncertainty adverb	Control uncertainty adverb
EB Group	-0.07†	-0.54	2.08
EPB Group	0.37†	-0.09	2.39
EI Group	0.16†	-0.47	2.55
EPI Group	0.21†	-0.65	2.62
EA Group	1.83	-1.05	2.77
NS Group	2.35	-1.33	2.93

† = significantly different from the NS Group

Can words heading conditional clauses license EPWs in L2 Chinese grammars? From the last column of Table 6, we can see that all groups' mean scores of the control sentences (i.e. the "Control-if" sentences with an embedded conditional clause but without any EPW) are above +1 although a significant difference is found between the NS Group and the Beginner Group in a post-hoc Tukey test following a one-way ANOVA (F=(10,227)8.175, p<0.001). However, results of post-hoc Tukey tests, which follow a one-way ANOVA (F=(10,227)5.400, p<0.001), reveal that there are significant differences between the NS Group and the English Beginner, Post-beginner and Intermediate Groups in judging experimental sentences with an EPW embedded inside a conditional clause. These results suggest that the Chinese equivalents of English words like "if" can perform the function of heading a conditional clause but they are unable to play a role of a licensor for EPWs in these beginner and intermediate groups' L2 Chinese grammars.

Table 6: Mean scores of judgment of wh-EPWs in if-clauses

	EPW in if-clause	*EPW not in if-clause	Control-if
EB Group	-0.41†	-0.61†	1.40†
EPB Group	0.76†	0.26†	1.76
EI Group	0.63†	0.08†	2.07
EPI Group	0.85	-0.34†	2.23
EA Group	1.55	-1.45	2.05
NS Group	2.10	-2.09	2.75

† = significantly different from the NS Group

This analysis is supported by the results of post-hoc Tukey tests following one-way ANOVAs comparing the three types of sentences involving conditional clauses in each group's judgment; in the judgment of the EB, EPB, EI, EPI Groups, no significant difference is found between the grammatical sentence with the EPW c-commanded by the if-word and the ungrammatical sentence in which the EPW is not c-commanded by the if-word. This suggests that no licensor-licensee relationship is established at these stages of L2 Chinese acquisition between the if-word and the EPW. As a result, no different behaviour is observed between the groups' judgment of sentences with the EPW c-commanded by "if" and their judgment of sentences with the EPW not c-commanded by "if". The post-hoc Tukey test results also indicate that if-words in conditional clauses acquire a licensing power for EPWs in English Advanced Group's L2 Chinese grammars as this group of learners are able to make a distinction between grammatical sentences with an EPW inside the conditional clause c-commanded by "if" and those ungrammatical ones with the EPW in the matrix clause and therefore not c-commanded by "if". They accept the former and reject the latter.

Table 7 provides information regarding the groups' judgment of EPWs licensed by the Chinese yes-no question particle *ma*. The results of their judgment of control sentences indicate that all learner groups have acquired Chinese yes-no questions with *ma* because their mean scores in judging the control sentences are all above the threshold of +1 although the Beginner Group is found significantly different from the NS Group in the post-hoc Tukey test following a one-way ANOVA (F=(10,227)4.360, p<0.001). However, all the learner groups, including the Advanced Group fail to

accept the experimental sentences with an EPW in the object or subject position c-commanded by the yes-no particle *ma*. As suggested in Table 7, their judgment of these grammatical sentences is indeterminate, and they are found significantly different from the NS Group in the post-hoc Tukey tests following two respective one-way ANOVAs (for obj-EPW + *ma*: F=(10,227)6.158, p<0.001; for subj-EPW + *ma*: F=(10,227)4.337, p<0.001). This implicates that the yes-no particle *ma* does not have licensing power over the EPW in these groups' L2 Chinese yes-no questions. The Advanced Group's failure to accept the grammatical yes-no question with an EPW c-commanded by the yes-no particle *ma* can be considered evidence of possible fossilization in this aspect of L2 Chinese grammars. The judgment data of the NS group show that EPWs are licensed in both subject and object positions of yes-no questions in the native Chinese grammar (their mean scores are 1.98 and 1.68 respectively).

Table 7: Mean scores of judgment of wh-EPWs in yes-no questions with *–ma*

	Obj-EPW + ma	**Sub-EPW + ma**	**Control-ma**
EB Group	-0.06†	-0.26†	1.88†
EPB Group	-0.79†	-0.55†	2.43
EI Group	-0.78†	-0.82†	2.48
EPI Group	-0.70†	-1.17†	2.60
EA Group	-0.63†	-1.25†	2.65
NS Group	1.98	1.68	2.86

† = significantly different from the NS Group

Like the yes-no particle *ma*, the inferential particle *–le* seems never able to acquire a licensing power for the EPW in learners' L2 Chinese grammars. As we can see in Table 8, all groups accept the control sentences, i.e. sentences with the inferential *–le* but without any EPW. In post-hoc Tukey tests following a one-way ANOVA (F=(10,227)3.097, p=0.001), only the Beginner Group is found significantly different from the NS Group. However, when an EPW is used in the subject or object position in the experimental sentences, all learner groups' judgment becomes indeterminate, as shown in Table 8. This is the case not only in the experimental sentences with the c-commanding inferential *–le* (see the second and third columns) but also in the experimental sentences without (see the fourth and fifth columns). In judging the four experimental sentences, all the learner groups are found significantly different from the NS Group in post-hoc Tukey tests following one-way ANOVAs (for "obj-EPW with *–le*": F=(10,227)4.461, p<0.001; for "subj-EPW with *–le*: F=(10,227)3.244, p=0.001; for *"obj-EPW without *–le*: F=(10,227)4.118, p<0.001; for *"subj-EPW without *–le*: F=(10,227)4.599, p<0.001). This implicates that no licensor-licensee relationship is established in any learner group's L2 Chinese grammars between the inferential *–le* and the EPW because the availability of the inferential *–le* seems to be irrelevant to the grammaticality status of the EPW in the learner groups' judgment of the sentences. This is supported by data from post-hoc Tukey tests comparing the four experimental sentences in each group's judgment; no learner group makes a significant distinction between the grammatical "obj-EPW with *-le*" and the ungrammatical *"obj-EPW without *–le*" and between the grammatical "subj-EPW with *–le*" and the ungrammatical *"subj-EPW without *–le*". It seems that the grammaticality status of the EPW in sentences with the inferential *–le* remains indeterminate throughout the L2 Chinese acquisition process.[2] As we can see in Table 8, the inferential *–le* has a licensing power in the native Chinese grammar, which enables the NS Group to accept grammatical sentences with an EPW in the subject or object position licensed by *–le* (mean scores = 1.25 and 1.84) and reject those ungrammatical sentences with the subject EPW or object EPW without the inferential *–le* (mean scores = -2.41 and -2.54). In post-hoc Tukey tests, the NS Group is found to be able to make significant distinctions between the former and the latter.

[2] The EPI group incorrectly reject grammatical sentences with a subject EPW c-commanded by the inferential *–le* (the EPI mean score = -1.04). This, however, is believed to be related to a general asymmetry between the subject EPW and the object EPW, whereby the former is less acceptable than the latter in L2 Chinese grammars.

Table 8: Mean scores of judgment of EPWs in sentences with a sentence final particle *-le*

	Obj-EPW with -le	**Subj-EPW with -le**	***Obj-EPW without -le**	***Subj-EPW without -le**	**Control -le**
EB Group	-0.53†	-0.40†	-0.58†	-0.53†	1.39†
EPB Group	-0.19†	0.10†	-0.13†	0.11†	1.59
EI Group	-0.46†	-0.25†	-0.40†	-0.14†	1.48
EPI Group	-0.64†	-1.04†	-0.74†	-0.74†	1.50
EA Group	0.66†	-0.17†	-0.68†	-0.73†	1.84
NS Group	1.84	1.25	-2.54	-2.41	2.74

† = significantly different from the NS Group

Recall that A-not-A is also a licensor for EPWs in Chinese if it is in a c-commanding position. However, the data in Table 9 show that it only has a licensing power in the native Chinese grammar but not in L2 Chinese grammars. In the post-hoc Tukey tests following a one-way ANOVA (F=(10,227)7.238, p<0.001), no learner group is found significantly different from the NS Group in judging the control sentences (i.e. sentences with the A-not-A but without any EPW). However, the post-hoc Tukey tests following a one-way ANOVA (F=(10,227)2.571, p=0.006) reveal that in judging the grammatical "A-not-A + obj-EPW" sentence (i.e. the experimental sentences), every learner group is significantly different from the NS Group.

Table 9: Mean scores of judgment of wh-EPWs in A-no-A sentences

	A-not-A + obj-EPW	***Subj-EPW + A-not-A**	**Control + A-not-A**
EB Group	-0.23†	-0.39†	1.43
EPB Group	-1.10†	-1.13†	2.18
EI Group	-0.39†	-1.01†	2.25
EPI Group	-0.70†	-2.48	2.90
EA Group	-0.50†	-2.77	2.50
NS Group	1.20	-2.45	2.80

† = significantly different from the NS Group

As we can see in Table 9, none of the learner groups, including the Advanced Group, accepts grammatical Chinese sentences with the A-not-A c-commanding an object EPW, even though they all accept the control sentences. This suggests that English learners of Chinese can acquire the A-not-A in the target language but they are unable to acquire its licensing power for the EPW. The NS group accepts the grammatical sentences with A-not-A c-commanding the object EPW (Mean score =1.20) and they clearly reject ungrammatical sentences with the subject EPW not c-commanded by the A-not-A (mean score = -2.45). In post-hoc Tukey tests comparing the three sentence types involving A-not-A in each group's judgment, significant differences are found between the grammatical "A-not-A + obj-EPW" sentences and the ungrammatical *"subj-EPW + A-not-A" sentences in the judgment of the English Post-intermediate and Advanced Groups as well as of the NS Group. However, as shown in the mean scores of the English Post-intermediate and Advanced Groups in Table 9, these groups of learners are able to reject the ungrammatical *"subj-EPW + A-not-A" sentences but they are unable to accept the grammatical "A-not-A + obj-EPW" sentences (their mean scores range from -0.50 to -0.91).[3] This implicates that no licensor-licensee relationship is established between the A-not-A and the EPW in these groups L2 Chinese grammars, and it seems that it never will, given that the English Advanced Group represents the final states of English speakers' L2 Chinese.

[3] I have no satisfactory explanation for the learner groups' rejection of the ungrammatical *"subj-EPW + A-not-A" sentences. Their rejection might be due to something other than the fact that the subject EPW is not c-commanded by the A-not-A in the sentence.

5. Discussion

We have seen that the yes-no particle *ma*, the inferential particle *–le* and *A-not-A* can never establish a licensor-licensee relationship with EPWs in English speakers' L2 Chinese. However, I argue that this syntax-semantics breakdown is not domain-wide but is reflected in individual EPW licensors because negators, non-factive verbs, uncertainty adverbs and "if"-words can eventually function as licensors for EPWs in final states of English speakers' L2 Chinese grammars and wh-words can be used as EPWs when they are licensed by these licensors.

Then why is it possible to establish the syntax-semantics interface between EPWs and some potential licensors but not the others in English speakers' L2 Chinese? I would propose an L1-dependent interface hypothesis to account for the discrepancy between the potential EPW licensors acquirable in L2 Chinese and those which are not. That is, grammatical aspects involving an interface between syntax and other cognitive domains is acquirable in adult L2 grammars if such an interface is established in some form in learners' L1; however, L2 items which are not available in learners' L1 will not be able to establish an interface relationship with another element in adult L2 grammars although they can fulfil their syntactic and semantic functions in a non-interface domain.

In our learners' L1 English, negators, non-factive verbs, certain adverbs and words heading a conditional clause can serve as licensors for negative polarity items (e.g. *any*),[4] as shown in (26).

(26)	a.	Jane does <u>not</u> like **anyone**.	(A negator as a licensor)
	b.	I <u>doubt</u> that Jane likes **anyone**.	(A non-factive verb as a licensor)
	c.	Jane <u>hardly</u> likes **anyone**.	(An adverb as a licensor)
	d.	<u>If</u> Jane likes **anyone**, she will tell her mother.	("If" as a licensor)
	e.	*Jane likes **anyone**.	(No licensor is available)

Although the licensors for negative polarity items in English may not necessarily be the same as the licensors for wh-words used as EPWs in Chinese,[5] the existence of these lexical items used as licensors for negative polarity items in learners' L1 can play a facilitating role in their acquisition of Chinese licensors for EPWs. This analysis can provide an explanation as to why negators, uncertainty adverbs, non-factive verbs and words heading conditional clauses are able to function as EPW licensors in English speakers' L2 Chinese grammars although they become available rather late in the development of their L2 Chinese grammars.

However, English does not employ sentence final particles like the yes-no particle *ma* or the inferential particle *–le*, nor does it use *A-not-A* to form a special type of yes-no questions. Our data suggest that these potential licensors can acquire the ability to provide appropriate semantic encoding information in L2 Chinese and are able to perform syntactic functions locally. However, they are unable to establish a semantics-syntax relationship with the EPW embedded in the sentence, even at the final state of L2 acquisition of Chinese. In English speakers' L2 Chinese, these items both syntactically and semantically can help form yes-no questions and sentences with an inferential meaning. What is missing is the syntactic "wiring" between the licensor and the EPW in the underlying representations of their L2 Chinese grammars. More specifically, there is no link between the potential licensor and the potential licensee in their L2 Chinese grammars. The consequence of this breakdown is that wh-words used as EPWs in L2 Chinese are without licensors, which results in variable behaviours of EPWs in L2 Chinese.

This persistent interface breakdown can be accounted for by the L1-dependent interface hypothesis proposed above. That is, an interface between two items which is not available in the learner's L1 but required in the L2 will no longer be possible in adult L2 grammars, which makes any interface "wiring" between the two items impossible in adult L2 grammars.

L2 learners of Chinese are exposed to positive evidence that wh-words in Chinese can be used in affirmative/negative sentences, conditional clauses, yes-no questions as well as in wh-questions. In

[4] Progovac (1994) proposes that it is a universal principle that all negative polarity items have to be licensed.

[5] For example, uncertainty adverbs such as *probably, perhaps, possibly* and certain non-factive verbs such as *pretend, guess* cannot serve as licensors for negative polarity items in English.

wh-questions, the wh-word is interpreted as interrogative word with the [+Q] and [+wh] features[6] and in affirmative/negative sentences, conditional clauses, yes/no questions, it can be interpreted as the EPW. However, there does not seem to be any salient evidence in their L2 Chinese input which can inform L2 grammars what factors determine the legitimate use of wh-words as EPWs in the target language. The input data can provide positive evidence informing L2 grammars that wh-words used as EPWs are possible in the target language but they do not provide positive evidence clear and salient enough to tell L2 grammars what exactly constrains the distribution of wh-words used as EPWs in Chinese. As a result, L2 Chinese grammars allow wh-words used as EPWs to stay optionally in the sentence without necessarily having a proper licensor.

Although there is a long period of variability regarding the behaviours of EPWs in L2 Chinese grammars, negators, uncertainty adverbs, non-factive verbs and words heading conditional clauses can be eventually acquired as EPW licensors by advanced learners. It is not clear what exactly triggers the link between EPWs and these potential licensors at advanced levels, but our data do suggest that "wiring" a licensor-licensee relation is possible between these lexical items and wh-words used as EPWs in L2 Chinese grammars.

It seems likely that L2 Chinese grammars, at least in the final states, are aware that wh-words used as EPWs are possible in the sentences concerned but they do not know that the yes-no particle *ma*, the inferential particle *–le* and *A-not-A* can function as licensors for wh-EPWs in Chinese. As a result, these licensors have no licensing power in the sentences. This can probably account for the variability in the behaviours of EPWs in the experimental sentences involving the yes-no particle *ma,* the inferential particle *–le* and *A-not-A*.

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[6] See Yuan (2007) for English speakers acquiring Chinese wh-questions.

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