

Intervention effects in English and Russian speakers' L2 Chinese wh-questions*

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The present paper examines whether intervention effects take place in the L2 Chinese grammars of seventy-one English-speaking and eighty-two Russian-speaking learners at five proficiency levels from post-beginner to very advanced. The overall findings of an Acceptability Judgment Task used in the study indicate that intervention effects occur with wh-adverbs but not with wh-nominals and temporary variability is found in early interlanguage grammars.

1 CROSS-LINGUISTIC DIFFERENCES WITH REGARD TO INTERVENTION EFFECTS

1.1 Intervention Effects in Chinese

It has been argued (e.g. Cheng and Rooryck 2002) that the nominal-adverb asymmetry accounts for intervention effects which occur with in-situ adverbs but not with in-situ nominals in Chinese. According to Cheng and Rooryck, wh-adverbs in Chinese have an operator that requires raising. However this raising is blocked by interveners such as negation *bu* or *mei* or quantificational subjects *henshaoren* 'very few people' and *meiyouren* 'no one'.¹ By contrast, no covert movement is involved with in-situ wh-nominals, as no operator is attached to them; thus no intervention effects are observed with wh-nominals in Chinese. Consider examples in (1) – (2) (adapted from Cheng and Rooryck (2002) and Soh (2005)):

- (1) a. Ta {mei} jian-guo **shei**?
he NEG meet-EXP who
'What is the person *x* such that he didn't meet *x*?'
b. *Ta {mei} **zenme** qu Taipei?
he not how go Taipei
'What is the means *x* such that he didn't go to Taipei by *x*?'
c. *Ta {mei} **weishenme** qu Taipei?
he not why go Taipei
'What is the reason *x* such that he didn't go to Taipei?'
- (2) a. {Meiyou ren} kandao **shenme**?
not-have person see what
'What is the thing *x* such that no one has seen *x*?'
b. *{Meiyou ren} **zenme** qu Taipei?
not-have person how go Taipei
'What is the means *x* such that no one went to Taipei by *x*?'
c. *{Meiyou ren} **weishenme** qu Taipei?
not-have person why go Taipei
'What is the reason *x* such that no one went to Taipei?'

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¹ Soh (2005) further suggests that *zhi* 'only', *chang* 'often' and *ye* 'also' are also interveners in Chinese, and they block covert movement of a wh-adverb, but not that of a wh-nominal.

From the Chinese data in (1) – (2), we can see that intervention effects occur with wh-adverbs *zenme* ‘how’ and *weishenme* ‘why’ but not with wh-arguments *shei* ‘who’ and *shenme* ‘what’.

1.2 Intervention Effects in Chinese

According to Beck & Kim (1997) and Pesetsky (2000), among others, an Intervention Effect is taken as a universal constraint on covert wh-feature movement, as formulated in (3).

(3) **Intervention Effect** (adapted from Beck & Kim 1997)

At LF, a wh-word (or its feature) cannot move across an intervening quantifier to its checking position: *[_{CP} ... wh-phrase_i ... QP ... t_i ...]

As shown in (3), a wh-word cannot undergo covert movement across a quantificational phrase to its checking position in CP (in Beck & Kim’s terminology), and thus the unlicensed wh-phrase renders the sentence ungrammatical. In other words, a quantifier may not intervene between a wh-phrase and its licensing complementizer.

In contrast to Chinese, movement of a wh-word in English and Russian is overt and no operator is attached to any of the wh-items in these two languages.² Given that the intervention effect is only observed with covert movement but not with overt movement, it is assumed that such effects are not applicable to English and Russian wh-questions (see also Soh (2005) for English).³

A summary of the occurrence of intervention effects in the three languages is given in Table 1.

Table 1 Summary of the cross-linguistic differences between Chinese, English and Russian wh-questions with regard to intervention effects

		Chinese	English	Russian
Behaviour of wh-word		In-situ	Wh-movement	Focus-movement
Operator attachment	wh-nominal	+	N/A	N/A
	wh-adverb	-		
Intervention effect	wh-nominal	+	N/A	N/A
	wh-adverb	-		

2 RESEARCH QUESTION AND HYPOTHESIS

The following research question and hypothesis are formulated in the present study with regard to intervention effects.

(4) *Will an operator be attached to wh-adverbs but not to wh-nominals in the L2 Chinese lexicon and furthermore, will its raising be blocked by interveners in L2 Chinese syntax?*

Recent study by Yuan (2007) has shown that although operator raising is blocked by islands in English speakers’ L2 Chinese grammars, variability can take place either temporarily or persistently in the interlanguage, which is caused by the interaction between syntax and another cognitive system. In line with Yuan’s findings, we hypothesise that an operator will be attached to wh-adverbs but not to wh-nominals in English and Russian speakers’ L2 Chinese lexicon, resulting in the latter staying in-situ inside intervention constructions, while the former being ruled out. It is further predicted that

² Wh-movement is overt in single wh-questions in English but is argued to be covert for the in-situ wh-word in multiple wh-questions.

³ There is one case, pointed out by Pesetsky (2000), in which English exhibits intervention effects: that is, when there is a Superiority violation configuration in D-linked multiple wh-questions, as in (i):

(i) *[Which book]₂ did {not} [which boy]₁ read?

We will not go into detail of discussing this case, as it is not relevant to our empirical study.

optionality will be found in learners' judgments as a result of a breakdown at a lexicon-syntax interface and both English and Russian speakers' wh-behaviours will not differ from each other in this aspect of Chinese grammar, given the similarities in their L1s.

2.1 Participants

173 participants were used in our empirical study, including 82 Russian speakers, 71 English speakers and 20 Chinese native speakers who served as a control group.⁴ The Russian subjects were students and lecturers of Chinese at Ulan-Ude and St Petersburg Universities in Russia. The English-speaking learners were mainly students attending Chinese language courses at universities in Beijing, including Beijing Language and Culture University, Capital Normal University and Beijing University. Among English subjects involved in our study were also students at the University of Cambridge and lecturers in Chinese Studies at some British Universities.⁵ Russian and English students who participated in the experiment were majoring both in Chinese and non-Chinese studies, while lecturers at Russian and British Universities were teaching Chinese or Chinese-related courses. Subjects in the native control group were students at Beijing Language and Culture University doing a non-language degree. Payment was given to Russian and English subjects during the data collection in Russia and China, respectively.

Based on their performance in a Chinese proficiency test, both Russian and English subjects were divided into five groups: Post-Beginner (PB), Intermediate (I), Post-Intermediate (PI), Advanced (A) and Very Advanced (VA). The proficiency test is a cloze test consisting of three passages which are given in both Chinese characters and in *pinyin*.⁶ Subjects had to fill in each blank choosing either the character or *pinyin*. The total score of the proficiency test was 40. Subjects whose scores in the proficiency test were between 1 and 14 were assigned to the post-beginner group. If the scores achieved by learners were between 15 and 22, they were categorised into the intermediate group and if the scores were between 23 and 29, subjects were classified into the post-intermediate group. Participants whose scores were between 30 and 35 and whose number of years of learning Chinese were less than ten years were assigned to the advanced group. Finally, subjects were considered to be very advanced speakers of Chinese if (i) they achieved 35 and above in the proficiency test; (ii) they had studied Chinese for at least ten years prior to the time of conducting the experiment; and (iii) they stayed in China or Taiwan for no less than three years in total. Most of the subjects that were classified into the very advanced group were lecturers at well-recognised higher education institutions in Russia and the UK who have extensively used Chinese at their workplace. Detailed information about each group is given in Table 2.

Table 2 Information about subjects

Groups	No. of subjects	Average age	Average months of learning Chinese	Average months in China/Taiwan	Mean scores in the Proficiency Test (range)	Standard deviation
English speakers of Chinese (total = 71)						
EPB	14	23	11	2	8 (1-14)	1.54
EI	15	25	29	8	19 (15-22)	2.85
EPI	16	26	38	16	26 (23-29)	1.84
EA	15	25	50	19	33 (30-35)	1.11
EVA	11	46	254	82	37 (35-39)	1.21
Russian speakers of Chinese (total = 82)						
RPB	22	18	13	1	9 (1-14)	1.74
RI	18	19	34	5	18 (15-22)	2.21
RPI	17	21	46	9	27 (23-29)	2.08
RA	15	23	57	15	33 (30-35)	2.03
RVA	10	40	192	58	37 (35-39)	2.42
NS	20	23	N/A	N/A	39 (37-40)	2.14

⁴ Data collected from five English subjects had to be excluded because two subjects were bilinguals and three subjects chose the answer "I don't know" for most of the test items.

⁵ I am aware that it is not desirable to mix subjects who learnt Chinese in different language environments. However, the vast majority of our English subjects recruited in China started learning Chinese in an English environment and were attending Chinese language programmes in Beijing at the time of testing, while all the English subjects in the UK had spent a certain period of time in China or Taiwan.

⁶ The cloze test was adapted from Limin Jin (2004).

In order to find out whether the eleven subject groups (i.e. five English groups, five Russian groups and the Chinese group) differed significantly from each other, a one-way ANOVA test⁷ was conducted on the scores of the cloze test. The result shows that there is a significant difference between all groups ($F(10, 162) = 448.271, p < 0.001$). The post-hoc Games-Howell⁸ tests reveal that the learner groups differ significantly from each other and that each of the learner groups, except for the EVA and RVA groups, is significantly different from the native Chinese group ($p < 0.05$).

Now let us find out whether a significant difference exists between English and Russian groups at the same Chinese proficiency levels. The results of an Independent-samples *t*-test show that there is no significant difference between EPB and RBP, between EI and RI, between EPI and RPI, between EA and RA, and between EVA and RVA groups ($p > 0.05$). This indicates that L2 groups at the same proficiency level of Chinese are homogeneous.

2.2 The Acceptability Judgment Task

Sentence types related to the research question raised in the previous section are presented in (5) and relevant sentences are given in Appendix 1.

(5) *Sentence Types on Intervention Effects used in the AJ task*

(I) Wh-questions with negation

- 1.1 Negation preceding a wh-nominal
- 1.2 *Negation preceding *zenme* 'how'
- 1.3 *Negation preceding *weishenme* 'why'

(II) Wh-questions with *zhi* 'only'

- 2.1 'Only' preceding a wh-nominal
- 2.2 *'Only' preceding *zenme* 'how'
- 2.3 *'Only' preceding *weishenme* 'why'

(III) Wh-questions with a negative quantificational subject *meiyouren* 'no one'

- 3.1 'No one' preceding a wh-nominal
- 3.2 *'No one' preceding *zenme* 'how'
- 3.3 *'No one' preceding *weishenme* 'why'

Context in the form of question-answer was provided for experimental sentences in order to make them sound more natural. Each test sentence was followed by a continuum scale ranging from “-3” ‘completely unacceptable’ to “+3” ‘completely acceptable’, as shown in (6).

(6) Acceptability scale in the AJ task

-3 _____ -2 _____ -1 _____ 0 _____ +1 _____ +2 _____ +3

completely very likely to be probably “I don’t know” probably very likely to be completely
unacceptable unacceptable unacceptable acceptable acceptable acceptable acceptable

The subjects were asked to judge the acceptability of each sentence by marking their choice on the scale.

⁷ Before comparing any means, we need to find out whether or not the subjects’ scores are normally distributed by running a Kolmogorov-Smirnov (K-S henceforth) test. If the data are in normal distribution, we use a one-way ANOVA. But if the scores are not in normal distribution, we conduct a Kruskal-Wallis test, which is a non-parametric version of the one-way independent ANOVA.

⁸ If according to the results of a Levene’s test for homogeneity of variance, population variances are found to be equal, we run a Tukey test, but if variances are not the same, we run a Games-Howell test. As the result of the Levene’s test indicates that variances of subjects’ scores in the cloze test are not equivalent, we conduct the Games-Howell test, which generally offers the most accurate performance when variances are not the same (Field 2005).

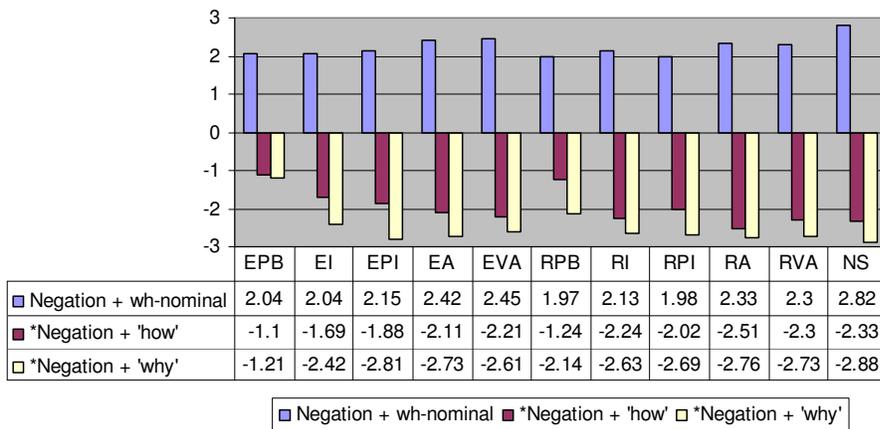
3 RESULTS

In this section, we will examine subjects' judgments of wh-questions with negation, *zhi* 'only' a negative quantificational subject *meiyouren* 'no one', accordingly, and will see whether intervention effects are detected in English and Russian speakers' L2 Chinese grammars.

3.1 Wh-questions with negation

Figure 1 presents results of subjects' judgments of wh-questions which involve negation as an intervener.

Figure 1 Mean scores of the judgment of Chinese wh-questions with negation



Let us first consider data in column entitled "Negation + wh-nominal", i.e. wh-questions in which negation precedes a wh-nominal. As we can see, all learners behave native-like in that they accept this question type. This is confirmed by the result of a one-way ANOVA, which indicates that there is no significant difference between the Chinese group and the learner groups in their judgments of this sentence type ($F(10, 162) = 1.177, p=0.310$).

From column headed by "*Negation + how", we can see that all learners reject this sentence, i.e. incorrect Chinese wh-questions in which a wh-adverb *zenme* 'how' is preceded by negation. According to the result of a one-way ANOVA, there is a significant difference between Chinese native speakers and learners ($F(10, 162) = 2.312, p=0.014$), but the follow-up Tukey tests show that no significant difference exists between the groups ($p>0.05$).

Subjects also reject incorrect wh-questions in which *weishenme* 'why' is preceded by negation, as shown in column headed by "*Negation + why". The result of a one-way ANOVA indicates that there is a significant difference between the groups ($F(10, 162) = 6.657, p<0.001$). However, the follow-up Tukey tests reveal that a significant difference exists only between the Chinese group on the one hand and EPB and RPB groups on the other hand ($p<0.05$).

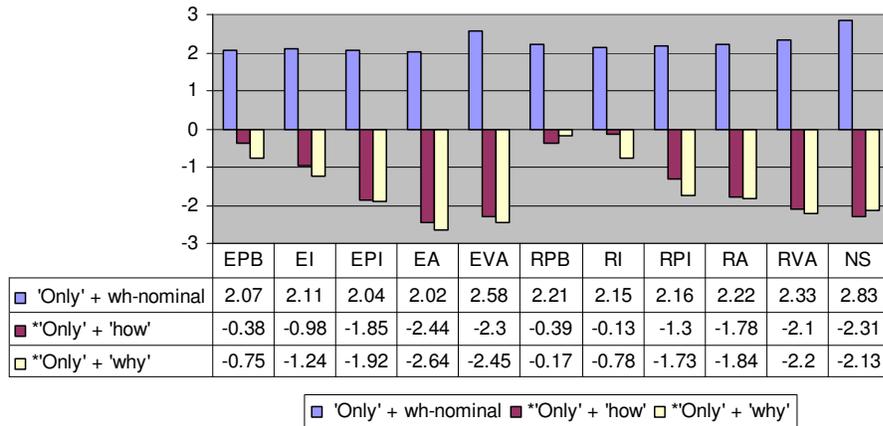
Let us now compare subjects' judgments of questions in which negation precedes wh-nominals with questions in which negation precedes wh-adverbs 'how' and 'why'. The results of the Paired-samples *t*-tests indicate that all subjects' judgments of the correct questions with negation preceding wh-nominals differ significantly from the judgments of the incorrect questions with negation preceding *zenme* 'how' and from the judgments of the incorrect questions with negation preceding *weishenme* 'why', respectively ($p<0.001$). This suggests that all subjects treat intervention constructions with wh-nominals differently from intervention constructions with wh-adverbs.

Comparisons between English and Russian groups at the same Chinese proficiency levels with regard to their syntactic behaviours in wh-questions with negation preceding wh-words were also made. The results of the Independent-samples *t*-tests indicate that a significant difference is only found between the EPB and RPB groups in their judgment of incorrect wh-questions with negation preceding *weishenme* 'why' ($t(34)=2.524, p=0.016$) but not between any other groups in judging these sentence types.

3.2 Wh-questions with *zhi* 'only'

Figure 2 presents results of subjects' judgments of wh-questions which involve an intervener *zhi* 'only'.

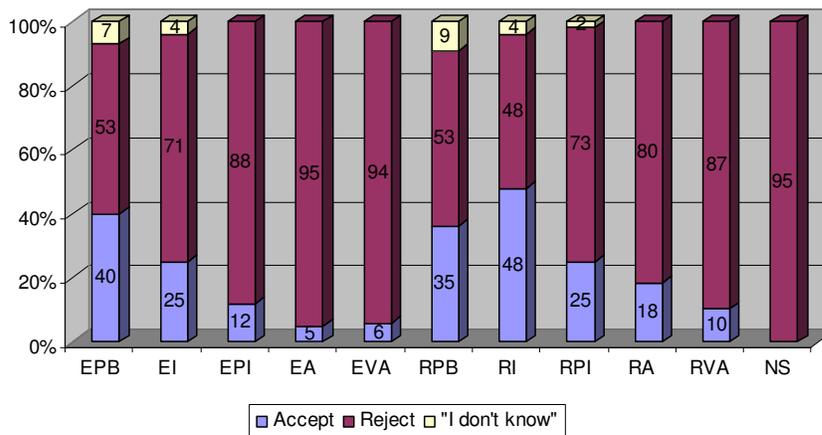
Figure 2 Mean scores of the judgment of Chinese wh-questions with 'only'



As we can see from column entitled “*Only* + wh-nominal”, all learners accept Chinese wh-questions in which *zhi* ‘only’ precedes a wh-nominal. The result of a one-way ANOVA indicates that there is no significant difference between the groups in their judgments of this sentence type ($F(10, 162) = 1.126, p=0.410$).

Column headed by “**Only* + *how*” shows the results of subjects’ judgments of incorrect Chinese wh-questions in which a wh-adverb *zenme* ‘how’ is preceded by *zhi* ‘only’. From the data in this column, we can see that English and Russian learners at post-beginner and intermediate proficiency levels are indeterminate in judging this sentence type, while learners at higher proficiency levels accept it. According to the result of a one-way ANOVA, there is a significant difference between the groups ($F(10, 162) = 4.375, p<0.001$), and the following-up Tukey tests reveal that a significant difference is found between the Chinese group and EPB, EI, RPB and RI groups ($p<0.05$). A careful examination of individual subjects’ judgments was made in order to see the degree of optionality in the interlanguage grammars, as shown in Figure 2.1.⁹

Figure 2.1 Percentage of accepting and rejecting wh-questions with ‘only’+ ‘how’

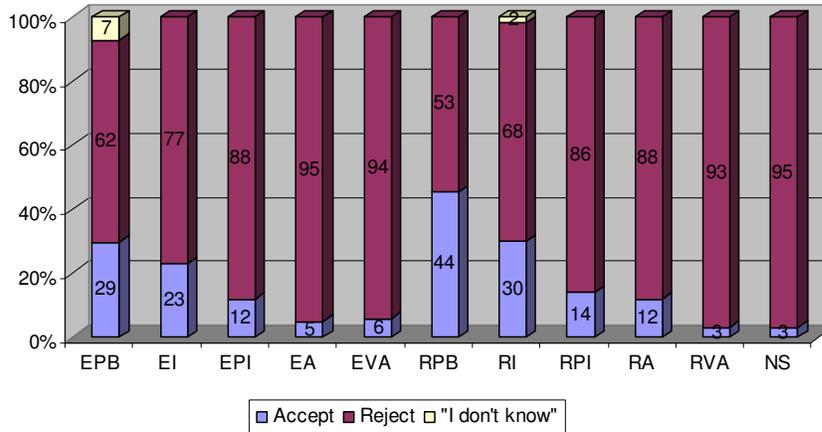


Individual data in Figure 2.1 reveals that English post-beginners and Russian post-beginner and intermediate groups are indeterminate in their judgments of incorrect wh-questions with *zhi* ‘only’ preceding *zenme* ‘how’, whereas English learners from intermediate level and Russian learners from post-intermediate level onward exhibit a small degree of optionality in judging this sentence type.

⁹ In individual analyses of intervention constructions, subjects’ scores from ‘+1’ to ‘+3’ were converted to “accept”, scores from ‘-1’ to ‘-3’ to “reject” and ‘0’ to “I don’t know”. The percentage is obtained by calculating the proportion of acceptance, rejection and answers “I don’t know” out of the total number of judged sentences by a certain group.

With regard to the judgments of incorrect wh-questions in which *weishenme* 'why' is preceded by *zhi* 'only', all subjects, except for the English post-beginner group and Russian post-beginner and intermediate groups, determinately reject this question type. The result of a one-way ANOVA indicates that there is a significant difference between the groups ($F(10, 162) = 4.268, p < 0.001$), but the following-up Tukey tests reveal that a significant difference exists only between the Chinese group and the EPB, RPB and RI groups, respectively ($p < 0.05$). Let us consider individual analyses in Figure 2.2.

Figure 2.2 Percentage of accepting and rejecting wh-questions with 'only'+ 'why'



From Figure 2.2, we can see that only Russian Post-Beginner group exhibits a high degree of variability in judging incorrect wh-questions with *zhi* 'only' preceding *weishenme* 'why' and there is a clear tendency of decreasing optionality in learners' judgments with the improvement of their proficiency level.

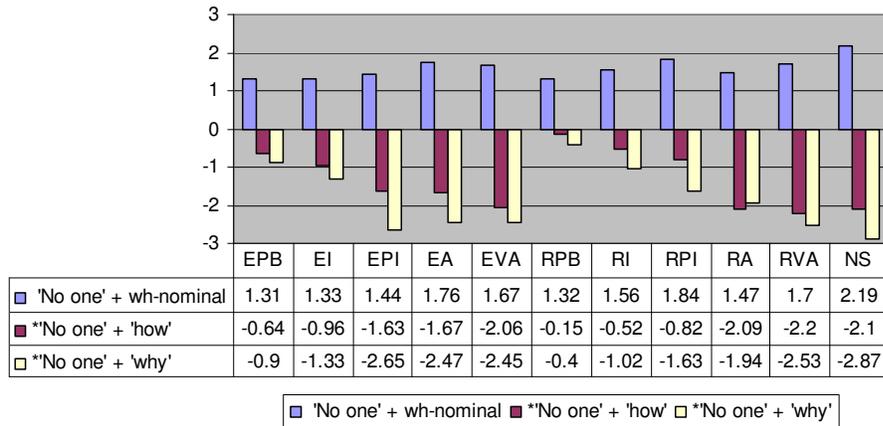
Now let us compare subject groups' judgments of questions in which *zhi* 'only' precedes wh-nominals with those in which *zhi* 'only' precedes wh-adverbs *zenme* 'how' and *weishenme* 'why'. The results of the Paired-samples *t*-tests indicate that all subject groups' judgments of the correct questions with 'only' preceding wh-nominals are significantly different from those of the incorrect questions with 'only' preceding 'how' and from those of the incorrect questions with 'only' preceding 'why' ($p < 0.05$). This suggests that all subject groups treat intervention sentences with wh-nominals differently from intervention sentences with wh-adverbs.

Comparisons between English and Russian groups at the same Chinese proficiency levels with respect to their syntactic behaviours in wh-questions with 'only' preceding wh-words were also conducted. The results of the Independent-samples *t*-tests show that no significant difference is found between English and Russian groups in their judgment of these sentence types ($p > 0.05$).

3.3 Wh-questions with a negative quantificational subject *meiyouren* 'no one'

Figure 3 presents results of subjects' judgments of wh-questions in which a negative quantificational subject 'no one' is an intervener.

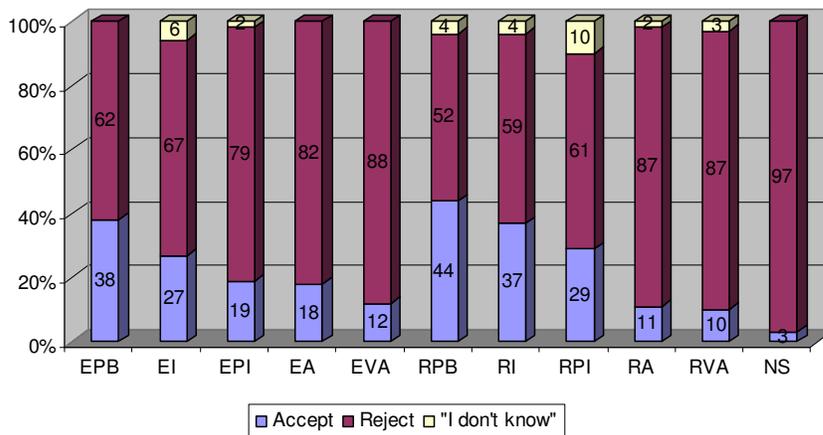
Figure 3 Mean scores of the judgment of Chinese wh-questions with a QS



Let us first look at the data in column entitled “No one + wh-nominal”, i.e. wh-questions in which a quantificational subject precedes a wh-nominal. As we can see, all subjects accept this question type. According to the result of a one-way ANOVA there is no significant difference between the Chinese group and the learner groups in their judgments of this sentence ($F(10, 162) = 0.648, p=0.770$).

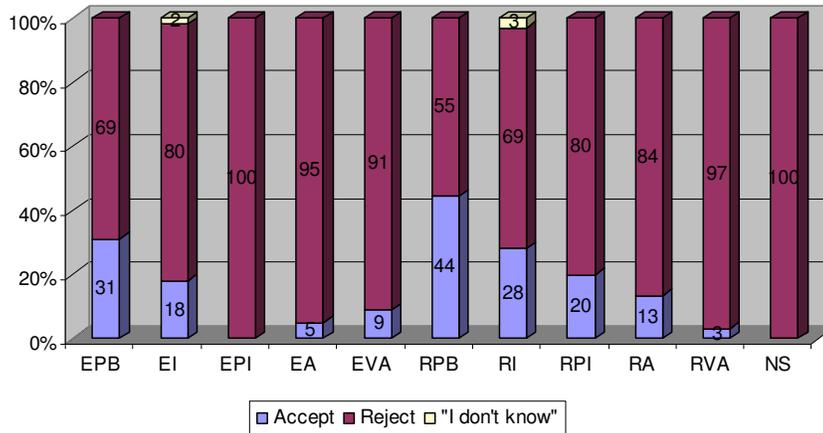
Column headed by “*No one + how” presents the results of subjects’ judgments of incorrect Chinese wh-questions in which a wh-adverb *zenme* ‘how’ is preceded by a *meiyouren* ‘no one’. According to the result of a one-way ANOVA, there is a significant difference between the groups ($F(10, 162) = 4.177, p<0.001$). The following-up Tukey tests reveal that a significant difference is found between the Chinese group and EPB, EI, RPB, RI and RPI groups ($p<0.05$). Analyses of individual subjects’ judgments of this question type show that variability in learners’ judgments gradually decreases from post-beginner to very advanced level, as illustrated in Figure 3.1.

Figure 3.1 Percentage of accepting and rejecting wh-questions with ‘no one’ + ‘how’



With regard to incorrect wh-questions in which *weishenme* ‘why’ is preceded by *meiyouren* ‘no one’, the result of a one-way ANOVA indicates that a significant difference is found between the groups ($F(10, 162) = 5.816, p<0.001$) and the post-hoc Tukey tests indicate that a significant difference exists between the Chinese group and EPB, EI, RPB, RI and RPI groups, respectively ($p<0.05$). Individual data shows that a high degree of optionality is only present in the judgment of the Russian post-beginner group, as demonstrated in Figure 3.2.

Figure 3.2 Percentage of accepting and rejecting wh-questions with 'no one' + 'why'



Now let us compare subject groups' judgments of questions in which 'no one' precedes wh-nominals with those in which 'no one' precedes wh-adverbs 'how' and 'why'. The results of the Paired-samples *t*-tests indicate that all subjects' judgments of the correct questions with 'no one' preceding wh-nominals are significantly different from those of the incorrect questions with 'no one' preceding 'how' and from those of the incorrect questions with 'no one' preceding 'why' ($p < 0.05$). This implies that all subject groups treat intervention structures with wh-nominals differently from those with wh-adverbs.

Comparisons between English and Russian groups at the same Chinese proficiency levels with respect to their syntactic behaviours in wh-questions with 'no one' preceding wh-words are also conducted. The results of the Independent-samples *t*-tests show that no significant difference exists between the English and Russian groups in their judgment of these question types ($p > 0.05$).

A summary of subjects' judgments of wh-questions with interveners is given in Table 2.¹⁰

Table 2 Summary of subjects' judgments of Chinese wh-questions with interveners

Group	Intervener + wh-nominal	Intervener + how			Intervener + why		
		*Negation + how	*Only + how	*QS + how	*Negation + why	*Only + why	*QS + why
EPB	√	X	?	?	X	X	X
EINT	√	X	X	X	X	X	X
EPI	√	X	X	X	X	X	X
EADV	√	X	X	X	X	X	X
EVA	√	X	X	X	X	X	X
RPB	√	X	?	?	X	?	?
RINT	√	X	?	?	X	X	X
RPI	√	X	X	X	X	X	X
RADV	√	X	X	X	X	X	X
RVA	√	X	X	X	X	X	X
NS	√	X	X	X	X	X	X

In Table 2, we can see that all learners accept Chinese questions in which an intervener precedes a wh-nominal. However, when an intervener precedes *zenme* 'how', subjects' judgments tend to be invariable at beginner to intermediate levels but not at higher proficiency levels; while in judging wh-questions with an intervener preceding *weishenme* 'why', almost all learners reject this question type in their L2 Chinese grammars.

¹⁰ The summary also includes individual subjects' judgments. Since all subject groups accept three types of questions with interveners preceding a wh-nominal (i.e. questions with negation, with 'only' and with a QS, respectively), their judgments are put under one column.

4 DISCUSSION OF RESULTS

In this section I will provide explanation for learners' judgments of wh-questions with interveners. We will first look at behaviour of wh-nominals in section 4.1, followed by behaviour of the wh-adverb *zenme* 'how' and *weishenme* 'why' in sections 4.2 and 4.3, respectively. The summary of findings will be given in section 4.4.

4.1 Behaviour of wh-nominals

Our data show that all learners from post-beginner to very advanced stage clearly accept wh-questions in which an intervener precedes a wh-nominal across three sentence types. This leads us to say that wh-NPs have a [+nominal] feature in L2 Chinese lexicon and no operator is attached to them. As a result, wh-nominals stay in-situ inside the intervention constructions in L2 Chinese syntax. It is not surprising that English and Russian learners can successfully attach a [+nominal] feature to wh-NPs in the interlanguage because wh-words such as 'who' and 'what' have a nominal status in their L1s, too.

4.2 Behaviour of the wh-adverb *zenme* 'how'

Let us now consider behaviour of the wh-adverb *zenme* 'how' in L2 Chinese wh-questions with interveners. It has been argued (e.g. Tsai 1994) that this wh-adverb has two readings in Chinese, namely an instrumental and a manner reading. Furthermore, it has been claimed that its behaviour differs depending on the interpretation it receives. If the interpretation is instrumental, then the wh-adverb has a [+nominal] feature and thus no operator is attached to it. However, if the wh-adverb has the manner interpretation, it is [-nominal] and has an operator that requires raising to ForceP for feature-checking. Covert raising of an operator is blocked by interveners and renders a sentence ungrammatical (e.g. Cheng and Rooryck 2002, Soh 2005).

It should be noted that in wh-questions in which *zenme* 'how' is preceded by an intervener, this wh-adverb has an instrumental reading but the sentence is ruled out, as shown in (7) (see also (1b) and (2b)).

- (7) a. *Lisi bu *zenme* qu Shanghai?
 Lisi not how go Shanghai
 'What is the means *x* such that Lisi doesn't go to Shanghai by *x*?'
 b. Ta bu zuo che qu Shanghai.
 he not sit car go Shanghai
 'He doesn't go to Shanghai by car.'

The answer in B to the question in A implies the instrumental interpretation of the wh-adverb. The wh-question in (7a) is ruled out, even though *zenme* 'how' has the instrumental reading. Tsai (2008) has suggested that negation induces strong intervention effects and blocks both manner and instrumental questions.¹¹ This explains why (7a) is ill-formed. I assume that Tsai's (2008) proposal can also account for the ungrammaticality of other experimental sentences in which instrumental *zenme* 'how' is preceded by *zhi* 'only' and a negative quantificational subject *meiyouren* 'no one'.

From this it follows that wh-questions with *zenme* 'how' preceded by interveners such as negation, *zhi* 'only' and *meiyouren* 'no one' are blocked even if 'how' is [+nominal]. The task that English and Russian speakers need to carry out in order to successfully acquire this type of sentence is to realise that the elements like negation, *zhi* 'only' and *meiyouren* 'no one' are "strong" interveners in Chinese in that they block wh-questions with the nominal wh-adverb *zenme* 'how'.

Now, let us examine learners' judgments of wh-questions in which these interveners precede *zenme* 'how'. As we have seen from Figure 1, all learners from a post-beginner to a very advanced proficiency level reject wh-questions with negation preceding 'how', which may suggest that both English and Russian learners have acquired the blocking power of negation. However, learners' judgments of wh-questions with *zhi* 'only' and *meiyouren* 'no one' preceding 'how' have revealed indeterminacy among lower proficiency groups. That is, according to the individual data analyses in Figure 2.1 and 3.1, English learners at post-beginner level and Russian learners at post-beginner and intermediate levels exhibit a high degree of optionality in judging wh-questions with 'only' and 'no one' preceding 'how'. The question, then is what causes variability in these learners' judgments? Before answering this question, we need to find out whether the interveners in question have blocking in the corresponding English and Russian configurations. Consider contrast in (8) – (9) (adapted from Rizzi (1990) and Cinque (1990)).

¹¹ Tsai (2008) suggests that in addition to a quantificational status, negation in Chinese has also a modificational status. As a result, when instrumental *zenme* 'how', which Tsai analyses as a nominal modifier, interferes with negation, the wh-question is blocked because negation doubles as a modifier.

- (8) a. ***How**_i did {no one} come t_i?
 b. **What**_i did {no one} buy t_i?
- (9) a. ***How**_i {didn't} you behave t_i?
 b. **What**_i {didn't} you bring t_i?

Sentences in (8) – (9) represent an instance of a weak negative island effect and their ungrammaticality is due to the violation of Rizzi's (e.g. 1990) Relativized Minimality (RM); that is, negative elements such as *no one* and *not* block wh-movement of adjuncts but not that of arguments in English.

The argument-adjunct asymmetry with regard to extraction out of the weak islands is also found in Russian, as shown in (10) – (11).

- (10) a. ***Kak**_i {nikto} ne priehal t_i?
 how no one not come
 *'How did no one come?'
- b. **Chto**_i {nikto} ne kupil t_i?
 what no one not buy
 'What did no one buy?'
- (11) a. ***Kak**_i on {ne} prishel t_i?
 how he not come
 *'How didn't he come?'
- b. **Chto**_i on {ne} kupil t_i?
 what he not buy
 'What didn't he buy?'

Like English, negative elements in Russian such as *nikto* 'no one' and *ne* 'not' intervene between the moved wh-adjunct and its trace and cause an RM violation.

Thus we can see that negative elements can in fact serve as interveners in English and Russian in that they block overt movement of a wh-adjunct. From this we assume that English and Russian speakers should not have a difficulty in detecting interveners in L2 grammars given that they are available in both L1s.¹²

I suggest the following explanation for the invariable behaviour of *zenme* 'how' in post-beginner and intermediate groups. Yuan (2007) has argued that English speakers are able to make a semantic distinction between instrumental 'how' and manner 'how'. Consider English and Russian examples in (11) and (12), respectively ((11) from Tsai 2008):

- (11) A: How did John handle this matter?
 B: a. Quite skillfully, I think. (manner reading)
 b. By pulling quite a few strings. (instrumental reading)
- (12) A. Kak Ivan prigotovil sup?
 how Ivan cook soup
 'How did Ivan make the soup?'
- B. a. Ochen bystro. (manner reading)
 very quickly
 'Very quickly.'
- b. Polozhiv svezhie ovoshi. (instrumental reading)
 put fresh vegetables
 'By putting fresh vegetables.'

¹² As we have just seen, negative elements can serve as interveners in English and Russian, but they are used in the environments different from Chinese, i.e. they block overt but not covert movement of wh-adjuncts in single wh-questions.

As we can see from (11) and (12), both interpretations of ‘how’ are available in English and Russian. Recall from the Chinese example in (6) that the answer provided for the wh-question implies the instrumental reading of *zenme* ‘how’. From this, learners should be able to assign the instrumental interpretation to the Chinese ‘how’ in their interlanguages and therefore mark it as [+nominal] in their L2 Chinese lexicon.¹³ Given that [+nominal] wh-elements in Chinese have no operator attached, they are insensitive to intervention effects, as is the case with wh-nominals. As a consequence, English post-beginners and Russian post-beginner and intermediate groups may have assumed that the nominal wh-adverb *zenme* ‘how’ should also be immune to the interveners and no blocking effect should arise. This may have led to the incorrect acceptance of wh-questions with *zenme* ‘how’ preceded by interveners by some learners at lower proficiency level. It is further assumed that these learners have detected the interveners in Chinese wh-questions but they have not perceived the “strong” blocking power of the interveners. That is, speakers of lower proficiency of Chinese have not realised that interveners such as *zhi* ‘only’ and *meiyouren* ‘no one’ are “strong” interveners in Chinese and they block wh-questions even when they precede the nominal wh-adverb *zenme* ‘how’.¹⁴

Now, let us examine behaviour of ‘how’ in the interlanguage grammars of English and Russian speakers at higher proficiency level of Chinese. From individual judgments in Figure 2.1 and Figure 3.1, we have seen that English learners from intermediate level and Russian learners from post-intermediate level onward reject wh-questions with ‘how’ preceded by interveners and they exhibit only a low degree of optionality. It is assumed that these learners have recognised the instrumental reading of ‘how’ in Chinese wh-questions with an intervener preceding it and, as a result, have attached a [+nominal] feature to this wh-adverb. Furthermore, these learners seem to have identified the involved interveners as “strong” and have realised that they render ungrammaticality to Chinese wh-questions in which these interveners precede ‘how’.

4.3 Behaviour of the wh-adverb *weishenme* ‘why’

It has generally been argued (e.g. Tsai 1994, Cheng and Rooryck 2002, Soh 2005) that the wh-adverb *weishenme* ‘why’ is a ‘real’ wh-adverb in that it is [-nominal] by nature and has an operator which covertly raises to its scope position in the ForceP. Furthermore, raising of an operator is blocked by interveners, and as a result, a sentence is ruled out, as shown in (13).

- (13) *Ta {zhi} **weishenme** qu Fagup?
 he not why go France
 ‘What is the reason *x* such that he only went to France?’

The wh-question in (13) is ill-formed because the negative marker blocks the covert movement of the operator attached to *weishenme* ‘why’.¹⁵ From this it follows that the task which the learners face is different from the one they have with *zenme* ‘how’. That is, in order to acquire Chinese wh-questions with an intervener preceding ‘why’, they need to mark this wh-adverb as [-nominal] and detect an operator attached to it.

Consider now learners’ judgments in this respect. From data in Figure 1, we have seen that all learner groups, including post-beginners, reject incorrect Chinese wh-questions in which negation precedes *weishenme* ‘why’. With regard to subjects’ judgments of the two other sentence types with interveners, group judgments in Figure 2 and Figure 3 indicate that English post-beginners and Russian post-beginner and intermediate groups are indeterminate in judging wh-questions with ‘only’ preceding ‘why’ and both English and Russian post-beginner groups exhibit invariability in judging wh-questions with ‘no one’ preceding ‘why’. Careful individual analyses in Figure 2.2 and Figure 3.2 have revealed that only Russian post-beginners display a high degree of optionality in their judgments of both sentence types. From these data it can be claimed that operator raising is generally blocked by interveners in L2 Chinese grammars. Given that the wh-adverb ‘why’ is [-nominal] both in English and Russian, learners do not have a difficulty in marking ‘why’ in L2 Chinese lexicon as [-nominal], and raising of an operator attached to it, is therefore blocked in L2 Chinese syntax. As far as the judgments of Russian post-beginners are concerned, it remains unclear at this stage why these learners exhibit variability in judging wh-questions with ‘weishenme’ preceded by ‘only’ and ‘no one’.

¹³ The wh-adverb ‘how’ in English and Russian has a [-nominal] feature, which the learners seem to manage to reset to [+nominal] in Chinese wh-questions that involve instrumental ‘how’.

¹⁴ A question may arise as to why no optionality occurs in these learners’ judgments of wh-questions with negation preceding ‘how’. I assume that this is because negation seems to have a stronger blocking power than ‘only’ and ‘no one’.

¹⁵ According to Tsai (2008), strong intervention effects are only detected with the wh-adverb *zenme* ‘how’ but not with *weishenme* ‘why’.

4 CONCLUSIONS

The results of my study have shown that learners can make a [+/-nominal] distinction and an operator is attached to the wh-adverb *weishenme* 'why' but not to wh-nominals in L2 Chinese lexicon. As a result, wh-nominals stay in-situ inside the intervention constructions, while *weishenme* 'why' is ruled out in L2 Chinese syntax. With regard to the behaviour of the wh-adverb *zenme* 'how', individual analyses suggest that English post-beginners and Russian post-beginner and intermediate groups are indeterminate in judging sentences with 'how' preceded by 'only' and 'no one'. It is assumed that although these learners mark *zenme* 'how' as [+nominal], they have not realised the "strong" blocking power of the interveners which block the nominal 'how'. As a consequence, variability has arisen in their judgments of these two question types.

My findings further indicate that the variability exhibited in the interlanguage grammars with regard to the behaviour of *zenme* 'how' in Chinese wh-questions with interveners is only temporary and gradually disappears with the improvement of the proficiency level both in English and Russian speakers' L2 Chinese wh-questions.

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APPENDIX 1: EXAMPLES OF TEST SENTENCES USED IN THE ACCEPTABILITY JUDGMENT TASK

(1) Wh-questions with negation

1.1 Negation preceding a wh-nominal

- (A: Zhangsan bu chi rou.)
 Zhangsan not eat meat
 'Zhangsan doesn't eat meat.'
 B: Zhangsan bu chi shenme?
 Zhangsan not eat what
 'What doesn't Zhangsan eat?'
 (A: Bu chi rou.)
 not eat meat
 '(He) doesn't eat meat.'

1.2 *Negation preceding *zenme* 'how'

- A: Xiao Liu bu zenme qu Beijing?
 Xiao Liu not how go Beijing
 'How will Xiao Liu not go to Beijing?'
 (B: Ta bu zuo che qu Beijing.)
 he not sit car go Beijing
 'He will not go to Beijing by car.'

1.3 *Negation preceding *weishenme* 'why'

- A: Xiao Wang bu weishenme qu Shanghai?
 Xiao Wang not why go Shanghai

‘Why does Xiao Wang not go to Shanghai?’
 (B: Yinwei Shanghai hen gui.)
 because Shanghai very expensive
 ‘Because Shanghai is very expensive.’

(2) Wh-questions with *zhi* ‘only’ as an intervener

2.1 ‘Only’ preceding a wh-nominal

(A: Zhe ge gongchang zhi mai qiche.)
 this CL plant only sell car
 ‘This plant only sells cars.’
 B: Zhe ge gongchang zhi mai shenme?
 this CL plant only sell what
 ‘What does this plant only sell?’
 (A: Zhi mai qiche.)
 only sell car
 ‘(It) only sells cars.’

2.2 *‘Only’ preceding *zenme* ‘how’

A: Xiao Wang zhi zenme qu-le Riben?
 Xiao Wang only how go-PVF Japan
 ‘How did Xiao Wang only go to Japan?’
 B: Ta zhi zuo feiji qu-le Riben.
 he only sit plane go-PVF Japan
 ‘He only went to Japan by plane.’

2.3 *‘Only’ preceding *weishenme* ‘why’

A: Liu San zhi weishenme qu-le Meiguo?
 Liu San only why go-PVF the US
 ‘Why did Liu San only go to the US?’
 (B: Yinwei ta zhi hui shuo yingyu.)
 because he only can speak English
 ‘Because he can only speak English’

(3) Wh-questions with a negative quantificational subject *meiyouren* ‘no one’ as an intervener

3.1 ‘No one’ preceding a wh-nominal

(A: Meiyouren xihuan Zhangsan.)
 nobody like Zhangsan
 ‘Nobody likes Zhangsan’
 B: Meiyouren xihuan shei?
 nobody like who
 ‘Who does nobody like?’
 (A: Zhangsan.)

3.2 *‘No one’ preceding *zenme* ‘how’

A: Meiyouren zenme qu Riben?
 nobody how go Japan
 ‘How does nobody go to Japan?’
 (B: Meiyouren zuo chuan qu Riben.)
 nobody sit ship go Japan
 ‘Nobody goes to Japan by ship.’

3.3 *‘No one’ preceding *weishenme* ‘why’

A: Meiyouren weishenme xue fayu?
 nobody why learn French
 ‘Why does nobody learn French?’
 (B: Yinwei fayu hen nan.)
 because French very difficult
 ‘Because French is very difficult.’

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