

1. Overview: Verb Classification and *Wh*-Binding Properties

Table 1. Verb Classification Overview

Verb Type	Wh-Feature	Binding Operator	Binding Site	Interpretation	Representative Examples
I. Factive Verb	[−WH, ∃]	(i) Question Operator (Qu); (ii) Existential Operator (OP _∃)	(i) Matrix-Qu; (ii) Embedded-OP _∃	(i) Direct Question; (ii) Existential Declarative	<i>zhidao</i> ‘know’, <i>jide</i> ‘remember’, <i>yishidao</i> ‘be aware’, <i>zhuyidao</i> ‘notice’, <i>taoyan</i> ‘hate’, <i>huixiangqi</i> ‘recall’.
II. Verb of Saying	[−WH, ∃]	Existential Operator (OP _∃)	Embedded-OP _∃	Existential Declarative	<i>tongzhi</i> ‘inform’, <i>gaosu</i> ‘tell’, <i>shuo-le</i> ‘say-PFV’.
III. [−WH] Verb	[−WH]	Question Operator (Qu)	Matrix-Qu	Direct Question	<i>renwei</i> ‘think’, <i>xiangxin</i> ‘believe’.
IV. [+WH] Verb	[+WH]	Question Operator (Qu)	Embedded-Qu	Indirect Question	<i>wen</i> ‘ask’, <i>xiangzhidao</i> ‘wonder’.

2. Introduction

- In Mandarin Chinese (henceforth MC), certain clause-taking verbs (e.g., *chajue* ‘perceive’, *faxian* ‘find out’, and *wangji* ‘forget’) can appear in both direct question (matrix scope) and indirect question (embedded scope). This behavior has led researchers to propose that these predicates come in two variants, one bearing [+WH] feature, whereas the other [−WH] features (Huang, 1982; Huang et al., 2009; Tsai, 1994, 2025; Cheng & Rooryck, 2002; Lahiri, 2002).
 - Verbs like *zhidao* ‘know’ are ambiguous, but [−WH] verbs *renwei* ‘think’ and *xiangxin* ‘believe’ force matrix scope, while [+WH] verbs *wen* ‘ask’ and *xiangzhidao* ‘wonder’ only allow embedded questions:
- (1) Ambiguous [+−WH] predicates in Mandarin Chinese:
Zhangsan *zhidao* [CP Lisi *zenme* shengbing le] (Causal *zenme* ‘how come’)
Zhangsan know Lisi how.come be.sick PRF
a. ‘Zhangsan knows how come Lisi got sick.’ (OK Indirect question)
b. ‘How come Lisi got sick in Zhangsan’s knowledge?’ (OK Direct question)

CP

Q

VP

V₀ [−WH]

CP

wh

...

Strong Qu-Operator obligatory binding

(2) Matrix scope of [−WH] predicates in Mandarin Chinese:
Zhangsan *renwei/xiangxin* Lisi *zenme* shengbing le
Zhangsan think/believe Lisi how.come be.sick PRF
‘How come Lisi got sick in Zhangsan’s belief?’ (OK Matrix scope—Direct question)

(3) Embedded scope of [+WH] predicates in Mandarin Chinese:
Zhangsan *xiangzhidao/wen* Lisi *zenme* shengbing le
Zhangsan wonder/ask Lisi how.come be.sick PRF
‘Zhangsan wonders/asks how come Lisi got sick.’ (OK Embedded scope—Indirect question)

CP

VP

V₀ [+WH]

CP

Q

CP

wh

...

Strong Qu-Operator obligatory binding

3. Key Insight

- These ambiguous verbs share a key semantic property: they **encode the speaker’s epistemic certainty on embedded clause**.
 - They are all *factive verbs*, which **presuppose the truth of their complements** (Baker, 1968; Hamblin, 1973).

4. Puzzle

Syntactic classification as [+WH]/[−WH] fails to address core questions:

- (i) Why do all ambiguous verbs fall into the *factive class*, encoding speaker certainty and presupposing truth?
 - (ii) If the ambiguity were purely syntactic in origin, we would **expect a more random distribution** across verb types.
 - However, its factive restriction indicates that a purely syntactic account is inadequate.

5. Proposal

The ambiguity stems from the presuppositional nature of factive verbs—not from feature duality.

The Old Feature-Based Ambiguity

Beyond Features: Existential-Operator Binding

- (i) **Strong Operator: Universal operator *dou* ‘all’ (∀_x) binding (Universal reading)**
 - (ii) **Strong Operator: Qu-operator (Q_x) binding (Question reading)**

Key point:
Strong operators block weak operators from binding in certain configurations, which explains why some verbs only allow direct or indirect readings.

Table 2. Purely [−WH]: **Base** matrix Q-operator binds *wh* in [Spec, CP]

gloss	Mandarin	gloss	Mandarin
‘believe’	xiangxin	‘hope’	xiwang
‘think’	renwei	‘assume’	yiwei
‘agree’	tongyi	‘feel’	juede

Obligatory matrix binding (strong operator)

Table 3. Purely [+WH]: **Trigger** embedded Q-operator binds *wh* in [Spec, CP]

gloss	Mandarin
‘wonder’	xiangzhidao
‘ask’	(xun)wen
‘inquire’	dating

Obligatory embedded binding (strong operator)

- (iii) **Weak Operator: Existential-operator (∃_x) binding (Existential reading)**

Optional embedded binding (a weak operator that nevertheless intervenes for matrix *wh*-questions)
(Note: *wh*-element may be optionally bound by a matrix Q-operator)

Table 4. Factive verbs: **Triggering** existential operator

gloss	Mandarin	gloss	Mandarin	gloss	Mandarin
‘know’	zhidao	‘reveal’	jielu	‘remember’	jide
‘explain’	jieshi	‘perceive’	chajue	‘recognize’	renchu
‘find out’	faxian	‘be aware’	yishidao	‘hate’	taoyan
‘be surprised’	hen jingya	‘notice’	zhuyidao	‘forget’	wangji
‘very regret’	hen yihan	‘recall’	huixiangqi	‘be odd’	gandao
					qiguai

Table 5. Verb of saying: **Triggering** existential operator

gloss	Mandarin
‘inform’	tongzhi
‘tell’	gaosu
‘confirm’	queren
‘admit’	chengren
‘say-PFV’	shuo-le
‘say-PROG’	shuo-zhe

Table 6. Other existential operators (Li, 1992; Lin, 1998)

negation operator	<i>bu</i> ‘not’ (¬∃)
possibility operator	<i>haoxiang/keneng</i> ‘possibly’ (◇)
conditional operator	<i>ruguo</i> ‘if’
yes-no question	sentence final particle <i>ma</i>

6. Analysis: Syntactic Schema and Correlation with Other Weak Operators

(4) [CP Zhangsan *jide*_[−WH, ∃] [CP OP_∃ Lisi *weishenme* bu-lai]].
Zhangsan remember Lisi why.INDF NEG-come
‘Zhangsan remembers that Lisi didn’t come for some reason.’ (Existential Reading)

(5) [CP Qu Zhangsan *jide*_[−WH, ∃] [CP OP_∃ Lisi *weishenme* bu-lai]].
Zhangsan remember Lisi why.Q NEG-come
‘Why did Lisi not come in Zhangsan’s memory?’ (Direct Question Reading)

(6) [CP Qu Zhangsan *shi-bu-shi*_[−WH] *jide*_[−WH, ∃] [CP OP_∃ Lisi *weishenme* bu-lai]].
Zhangsan COP-NEG-COP remember Lisi why.INDF NEG-come
‘Does Zhangsan remember that Lisi didn’t come for some reason?’ (A-not-A Test)

(7) [CP Qu Zhangsan *shenme*_[−WH] [CP Qu Zhangsan *jide*_[−WH, ∃] [CP OP_∃ Lisi *weishenme* bu-lai]].
ask.polite Zhangsan remember Lisi why.Q NEG-come
‘Let me ask you: Lisi didn’t come in Zhangsan’s memory?’ (‘Qingwen’ Test)

CP

Q

VP

V₀ [−WH, ∃]

CP

wh

...

Strong Qu-Operator binding is blocked by OP_∃

(8) ta *mei*_[−∃] chi *shenme*
3SG NEG eat what
a. ‘He didn’t eat anything.’ (Existential negation reading)
b. ‘What didn’t he eat?’ (Direct question reading)

(9) ta *haoxiang*_[Q] chi-le *shenme*
3SG seem eat-PFV what
a. ‘It seems that he ate something.’ (Existential epistemic modality reading)
b. ‘What did he seem to eat?’ (Direct question reading)

Selected references: Baker, Carl Leroy. 1968. *Indirect questions in English*. University of Illinois at Urbana-Champaign. • Lahiri, Utpal. 2002. *Questions and answers in embedded contexts*. Oxford Studies in Theoretical. • Li, Yen-hui Audrey. 1992. "Indefinite wh in mandarin chinese." *Journal of East Asian Linguistics* 1.2: 125-155. • Lin, Jo-Wang. 1998. "On existential polarity-wh-0phrases in Chinese." *Journal of East Asian Linguistics* 7.3: 219-255.