Restricting ignorance

1 Introduction. Mandarin *wh*-indefinites in non downward-entailing (DE) contexts trigger obligatory ignorance inference, meaning that the speaker cannot identify the witness of the indefinite. Liu and Yang (2021) suggest that this obligatory ignorance inference (OII) is derived via Exh, a silent exhaustivity operator (e.g., Chierchia, 2006, 2013; Fox, 2007), scoping over an epistemic operator, K being a covert one (Kratzer & Shimoyama, 2002; Meyer, 2013): $Exh(Kp)$—(roughly) 'I know p, and that's all I know.' However, I will observe that introducing K would lead to two overgeneration puzzles. It allows for negative polarity items (NPIs) where they are forbidden and unattested scopal interactions with *only*. Preserving Liu and Yang's idea requires restricting the distribution of K. In this paper, I lay out these problems and provide a unified solution: Mandarin *wh*-indefinites select for an epistemic operator (e.g., the covert K), and K can only be inserted when it is grammatically licensed (*pace* Meyer, 2013).

2 Ignorance inference via K. Mandarin *wh*-indefinites have both interrogative and indefinite interpretations. The use of existential *wh*-indefinites like *shénme* results in an ignorance inference in positive sentences like (1)[1]: 'the speaker knows there is some TV program that ZS is watching, and *that is all* **they know**.' Unlike English *some* and Mandarin numeral-classifier NPs and bare indefinites, ignorance is not cancellable, as attested by the *namely*-test in (2). Ignorance is obviated when the *wh*-indefinite is in DE environments.

(1) Zhāngsān zài kàn *shénme* diànshìjù (*Mod. from* Lin et al., 2014)
ZS ASP watch what TV program
[Question] 'What TV program is ZS watching?'; **[Assertion]** 'ZS is watching some TV program.'

(2) Zhāngsān zài kàn *shénme* diànshìjù, míngzì #(kěnéng) jiào Fánhuā
ZS ASP watch what TV program name possibly call Blossoms Shanghai
'ZS is watching some TV program, whose name is probably *Blossoms Shanghai*.'

Liu and Yang (2021) thus develop a grammatical analysis for OII, based on exhaustification (defined as in (3a)). The proposal is as follows: (i) Mandarin *wh*-indefinites are existential quantifiers and trigger singleton (sub)domain alternatives, from which alternative propositions grow point-wise (Rooth, 1985). As a result, we obtain the alternatives for (1): $ALT = \{\texttt{watch}(a)(ZS), \texttt{watch}(b)(ZS), \texttt{watch}(c)(ZS), ...\}$, where $\{a, b, c, ...\}$ are all TV programs. (ii) Without overt epistemic modals, K is posited in the LF (Kratzer & Shimoyama, 2002) to derive an ignorance and avoid contradiction: in (1), without K, negating the alternatives would amount to *anti-*$\exists$ *inference*, contradicting with the prejacent (see (3b)). Instead, as in (3c), the prejacent of Exh should be (3d), where $p =$ 'ZS is watching some TV program.'

(3) a. $[\![Exh]\!] = \lambda p_{\langle s,t\rangle} \lambda w\, [\, p(w) \wedge \forall p' \in ALT\, [\, p'(w) \rightarrow p \subseteq p'\,]]$
b. LF1: $[Exh[\ldots wh(=\exists)\ldots]] = \perp$ (*anti-*$\exists$ inference) c. LF2: $[Exh[K[\ldots wh\ldots]]]$ (OII)
d. $[\![\Box_s p]\!] = \lambda w. \forall w' [\, w'$ is compatible with speaker's belief in $w \rightarrow$ the speaker believes $p(w')\,]$

3 Puzzle 1: NPIs. The analysis requires that ignorance in modal-less contexts depend on a covert K operator. Yet, if K can be freely inserted, an overgeneration puzzle results. Chierchia (2006) provides that NPIs are subject to exhaustification. An NPI like *any* cannot appear, except in DE environment (e.g., *John likes **any** movie). Chierchia proposes an LF configuration as in (4a), with an obligatory Exh scope over *any*. Since NPIs like *any* are assumed to trigger subdomain alternatives, (4a) yield the same contradiction as in (3b), due to the anti-$\exists$ inference. However, were K available in the grammar, it could be inserted to rescue an NPI in a matrix environment the same way of deriving OII, contrary to fact.

(4) Non DE contexts
a. $[Exh\,[\ldots\ any\ \ldots]] = \perp$ (cf. 3b)
b. $[Exh\,[K\,[\ldots\ any\ \ldots]]]$ $\rightsquigarrow$ *Not attested*

(5) DE contexts (K is innocuous)
a. $[Exh\,[\ldots \neg \ldots\ any\ \ldots]]$
b. $[Exh\,[K\,[\ldots \neg \ldots\ any\ \ldots]]]$

If one includes K in the grammar (Kratzer & Shimoyama, 2002; Meyer, 2013), the dilemma in (4b) is inevitable. Yet, without K, contradiction arises in (3b). One may appeal to pragmatics to derive ignorance, but it would be hard to account for why ignorance is obligatory with the matrix *shénme*, as shown in (1 & 2). In response, I propose to maintain K, but restrict its distribution in the grammar.

[1] Since Chen's (2017) observation, the NPI analysis for Mandarin *wh*-indefinites falls short of empirical adequacy.

4 Solution: Restricting K. I propose that Mandarin *wh*-indefinites (and possibly, other epistemic indefinites that trigger OII) are licensed by both Exh and an epistemic modal, such as the covert K (Kratzer & Shimoyama, 2002). The syntactic configuration is in (6). I take it that a Mandarin *wh*-indefinite has uninterpretable $[uExh]$ and $[uK]$ features, and it must enter into an Agree relation with operators Exh and K via Upward Agree (Zeijlstra, 2012).

(6) ZS is watching *shenme* TV program.
LF: [Exh [K [ZS is watching *shenme* TV program]]].
$[iExh]$ $[iK]$ $[uExh,\ uK]$

In the case of *any*, I suggest that K is not in the structure. A core assumption adopted is that K can only appear as a last resort in the structure, when required by syntactic features. (4a) and (3c) are elaborated as follows:

(7) *Any* and *wh*-indefinite in non DE environment
a. $[Exh\ [\ldots\ any_{[uExh]}\ \ldots]] = \bot$ b. $[Exh\ [K\ [\ldots\ wh_{[uExh,uK]}\ \ldots]]]$

5 Puzzle 2: *Only*. The grammatical restriction of K can also explain why it seems that overt operators like *only* cannot scope over K. As shown in (8a), if K were in the structure and *only* scoped over it, the sentence would read 'The speaker$_i$ only knows Carol saw Amy, and it is possible to them$_i$ that Carol saw Bani', which is coherent but unattested. While this scope-freezing effect between *only* and K might result from *only* being scopally more restricted than Exh (cf. LF in (6) and (8a)), the current proposal offers a straightforward solution: K cannot appear in a context where it is not grammatically licensed by another expression (e.g., *shénme*). Given that assertion is a speech act expressing the speaker's belief, an inference about speaker's beliefs may derive *pragmatically*. That *only* never scopes over the speaker's belief follows naturally: *only* cannot take scope over K if it is not represented as an operator in the syntax.

(8) * Carol saw only Amy$_F$. And possibly, she saw Bani$_F$.
a. LF1: * [[[Only Amy]$_1$ $\boxed{K\ [\text{ Carol saw } t_1]}$] & ◇[Carol saw Bani$_F$]]
b. LF2: [$\boxed{K\ [\ [\text{Only Amy}]_1\ [\text{ Carol saw } t_1]\ ]}$ & ◇[Carol saw Bani$_F$]] = ⊥

6 Discussions. (a) **Mandarin *wh*-indefinites as epistemic indefinites.** We predict that the use of existential *wh*-indefinites necessitates an epistemic operator. In modal-less DE contexts like negation, while Exh is vacuous, the presence of K might be supported by the fact that negative sentences with *wh*-indefinites scoping under negation require denial contexts (Chen, 2021; Dong, 2009) (cf. Mandarin *rènhé* 'any', English *any*, compatible with non-denials). In a non-denial context like (9), the use of *shénme* in ϕ is odd. When answering 'What did ZS buy finally?', asserting ϕ with *shénme* (stress on *méi* 'NEG' required) is acceptable: in response to p conveyed by the interlocutor (here, p is the existential presupposition of the question), the speaker affirms $\neg p$, which might be natural to be modalized as about the speaker's own beliefs against the interlocutor's.

(9) Zhāngsān qù-le yītàng shāngdiàn. ϕ =[Zuìhòu tā méi mǎi { ?shénme/ ✓rènhé} dōngxi.]
Zhangsan go-ASP once store finally he NEG buy what/ any thing
'Zhangsan went to the store. In the end, he didn't buy anything.' (*Mod. from* Dong, 2009: p.141)

(b) **Optional ignorance.** In the current proposal, the ignorance triggered by Mandarin *wh*-indefinites is derived from exhaustifying subdomain alternatives of the modalized prejacent: $Exh_{ALT_{\text{Subdomain}}}(Kp)$. Crucially, the obligatoriness results from the feature specification on the *wh*-indefinites—*shénme*$_{[uExh,uK]}$. What about optional ignorance? The current proposal leads to a possible typology of indefinite expressions based on features. For cases of optional ignorance, one possibility is that the indefinite is specified for K, but not Exh. If Exh, unlike K, can be freely inserted when not grammatically required (Chierchia et al., 2012), ignorance would be derivable with such an indefinite when Exh is present. Another possibility is that the indefinite has neither K nor Exh features. Without a $[uK]$ feature specified, K could not be inserted in the structure, and if this indefinite triggers subdomain alternatives, crucially, optional ignorance would have to be derived pragmatically (Grice, 1989) because the grammatical route via Exh would lead to contradiction. The pragmatic and grammatical approaches thus differ in the feature specification of $[uK]$, for which independent evidence for the existence of K (e.g., requirement of denial contexts) will be a relevant diagnostic. I leave exploring these possibilities to the future.