Interrogative and standard disjunction in Mandarin Chinese

Michael Yoshitaka ERLEWINE, University of Helsinki / National University of Singapore

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Mandarin Chinese lexically distinguishes the disjunctors in alternative questions (*háishi*) and in disjunctive propositions (*huòzhe*), reflecting a distinction that Haspelmath (2007) and others have called *interrogative* versus *standard disjunction*. I argue that the two disjunctors share their basic syntax and semantics as junction heads (J) that project their disjuncts as Roothian alternatives, which are then interpreted by a corresponding question-forming operator or existential operator. I motivate this view from island insensitivity and focus intervention effects, which I show to apply in parallel to both alternative question formation with *háishi* and the scope-taking of *huòzhe*.

Háishi also allows for number of non-interrogative uses, subject to significant speaker variation. I argue that these patterns reflect broadly two types of grammars: those where *háishi* syntactically enforces that its alternatives be interpreted for question-formation or similar, and those that do not. For the latter, more liberal speakers, *háishi* can be used non-interrogatively in the same environments that *wh*-phrases can be. The study and analysis of this pattern of variation leads to the conclusion that a so-called "interrogative disjunction" could be so specified via its syntactic specification or through its semantics alone, with both strategies being attested amongst speakers of Mandarin Chinese.

Contents

1 Introduction

Mandarin Chinese has two disjunctors: *háishi* and *huòzhe*. Consider the sentences in (1a) and (1b), which are superficially identical except for the choice of disjunction. Example (1a) uses *háishi* and must be interpreted as an alternative question, which is answered by identifying which person Zhang San likes. Equivalents of 'yes' or 'no' are not valid replies to (1a) (Li and Thompson, 1981: 558–561). In contrast, (1b) uses *huòzhe* and must be interpreted as a declarative expressing a logical disjunction.[1]

(1) **Interrogative and standard disjunctors in Mandarin Chinese:**

    a. *háishi* $\Rightarrow$ alternative question:

        Zhāng Sān xǐhuān Lǐ Sì *háishi* Wáng Wǔ (ne)?

        Zhang San like   Li Si IDISJ   Wang Wu NE

        'Does Zhang San like Li Si or Wang Wu?' (alternative question)

    b. *huòzhe* $\Rightarrow$ disjunctive statement:

        Zhāng Sān xǐhuān Lǐ Sì *huòzhe* Wáng Wǔ.

        Zhang San like   Li Si SDISJ   Wang Wu

        'Zhang San likes Li Si or Wang Wu.'

I will refer to and gloss *háishi* as *interrogative disjunction* (IDISJ) and *huòzhe* as *standard disjunction* (SDISJ). I adopt these terms from Haspelmath (2007) and Mauri (2008), who discuss pairs of this type from a typological perspective.

The first contribution of this paper will be to present a concrete compositional semantics for these two disjunctors. I argue that both disjunctors share their basic syntax and semantics. Syntactically, both are J (junction) heads (Den Dikken, 2006) that take disjuncts of variable size. Semantically, I follow prior approaches that treat disjunction as introducing a set of alternatives (e.g. Aloni, 2003, 2007; Simons, 2005; Alonso-Ovalle, 2006, 2008, 2009) but recast this intuition within the two-dimensional Alternative Semantics framework of Rooth 1985, 1992 et seq. Both disjunctors project their disjuncts as a set of alternatives, with no defined ordinary value, parallel to the semantics for *wh*-phrases (e.g. Beck, 2006; Kotek, 2019). In simple cases as in (1a,b) above, alternatives projected by *háishi* will be interpreted by a question operator Q, leading to an alternative question interpretation, whereas those projected by

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[1] The disjunctor *huòzhe* can also be *huòshì* or simply *huò*. Lü (1980: 196) notes that *huò* is associated more with written texts, which Jing-Schmidt and Peng (2016: 108–109 note 7) confirm through their corpus study. For uniformity, here I use *huòzhe* throughout.

    Note that the standard disjunctor *huòzhe* can also be part of a question, such as as a *wh*-question or a polar question, but these questions differ from an alternative question as in (1a) that seeks to choose between the different disjuncts. See note 9.

huòzhe will be interpreted by an existential operator ∃ that produces a disjunctive proposition. This correspondence between the forms of disjunctors and their corresponding operators will be enforced partially but not entirely by syntactic feature-checking, as I discuss further below.

I present my core proposal and necessary theoretical background in section 2. I then present motivating evidence for my proposal from parallels between the two types of disjunctions in their insensitivity to islands and susceptibility to focus intervention effects (as in Beck, 2006; Beck and Kim, 2006), in section 3. This evidence is supplemented by arguments for the proposed syntax of disjunction in Appendix **??**, in particular arguing against prior approaches that treat *háishi* interrogative disjunction as uniformly taking disjuncts of underlyingly clausal size.

The second contribution of this paper will be to address and account for the distribution of non-interrogative uses of *háishi*, in section 4. In certain environments, such as with the quantificational particle *dōu* as in (2a) and, for a subset of speakers, under epistemic modals as in (2b), the use of *háishi* does not lead to the expression of an alternative question.[2]

(2) **Non-interrogative uses of *háishi*:**

    a.   <u>Universal *háishi* with *dōu*</u>:   (Huang, Li, and Li, 2009: 242)

            Júzi   *háishi* píngguǒ dōu xíng.
            orange IDISJ apple   DOU okay
            'Oranges and apples are both ok.'

    b.   <u>Existential *háishi* under modals, for some speakers</u>:   (based on Lin, 2008: 75, 118)

          %Tā dàgài/kěnéng   xǐhuān Zhāng Sān *háishi* Lǐ Sì.
          3sg probably/might like   Zhang San IDISJ   Li Si
          'S/he probably/might like(s) Zhang San or Li Si.'

Synthesizing judgements from previous literature as well as from other native speakers, I show that the pattern of judgments as in (2a) vs (2b) here reflects the existence of broadly two patterns of judgments across speakers of Mandarin Chinese. For one group of speakers who allow the universal uses as in (2a) but not the existentials as in (2b), the use of *háishi* is featurally tied to the use of the operator Q. Apparently non-interrogative uses of *háishi* for these speakers are thus limited to environments that involve embedded

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[2] The mark % on (2b) indicates this variation in judgments. Concretely, examples of the form in (2b) (with some lexical substitutions) are reported as grammatical by Lin H.-Y. (2008: 75, 101, 118) and then reproduced as such by R. Huang (2010a: 130) and Tsai (2015a: 49). However, the use of *háishi* in this example is judged as ungrammatical by two anonymous reviewers as well as various other speakers that I have consulted. In contrast, all speakers accept the use of *huòzhe* in place of *háishi* for the intended reading.

questions or which also involve the use of Q, which I argue to be the case in (2a). For the other group of speakers who allow non-interrogative *háishi* with an existential interpretation in various contexts, such as in (2b), I propose that *háishi* does *not* syntactically enforce its conventional cooccurrence with a particular interpreting operator. *Háishi* disjunctions are then syntactically and semantically equivalent to that of *wh*-phrases for these speakers, simply with a domain corresponding to the named disjuncts. We then correctly predict that, for these speakers, *háishi* can be used non-interrogatively in the same environments where *wh*-phrases can be, as has been observed previously by Lin Hsin-yin (2008). For all speakers, I propose that the standard disjunctor *huòzhe* syntactically enforces its interpretation by a corresponding existential operator ∃, blocking its alternatives from being used to form an alternative question.

My proposal for the attested variation in these non-interrogative uses of *háishi* thus speaks directly to the question of what it means for *háishi* to be an "interrogative disjunction." That is, we could imagine the link between an interrogative disjunction and alternative questionhood being enforced through syntactic mechanisms or merely through the compositional semantics. My proposal here demonstrates that both strategies are possible and indeed attested in language; the first group of Mandarin speakers enforces this link syntactically, while the second group does not. This in turn suggests lessons for the analysis of so-called interrogative disjunctions in other languages as well, which I discuss in my conclusion in section 5.

2   Proposal

My proposal is couched within the framework of Alternative Semantics (Rooth, 1985, 1992) and its extension to interrogatives, which builds on Hamblin 1973 and is developed in Beck 2006 and Kotek 2019. The key features of this framework, which I call *Rooth-Hamblin Alternative Semantics*, is that it is two-dimensional and that the same alternative set dimension is used both for the computation of focus alternatives and interrogative (Hamblin) alternatives.

In Alternative Semantics, each node α in the syntax is associated with two meanings in different "dimensions": the ordinary semantic value $[\![\alpha]\!]^{\text{o}}$ and a set of alternatives $[\![\alpha]\!]^{\text{alt}}$.[3] The interpreted meaning of an utterance is its ordinary semantic value. Alternative sets are computed compositionally parallel to the computation of ordinary semantic values, using a process of *pointwise composition*. Full interpreted structures must satisfy the constraint I call *Interpretability* in (3) below. By default, the alternative set for a node α is simply the singleton set with its ordinary value, $\{[\![\alpha]\!]^{\text{o}}\}$, thus trivially satisfying Interpretability.

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[3] In Rooth 1992 and much following work, the alternative set for node α is called the "focus-semantic value" and written $[\![\alpha]\!]^{\text{f}}$. The use of this "alternative" dimension for focus alternatives but also for the interpretation of interrogatives, in the spirit of

(3) **Interpretability:** (based on Rooth 1992; Beck 2006: 16)

To interpret α, $[\![\alpha]\!]^{\mathrm{o}}$ must be defined and $\in [\![\alpha]\!]^{\mathrm{alt}}$.
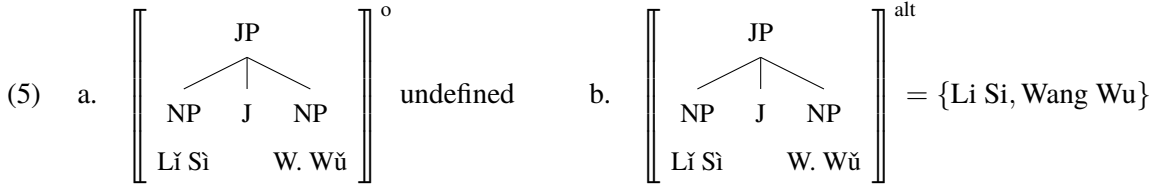
I first describe the function of J, the abstract, polyadic functional head underlying disjunctions (Den Dikken, 2006), which is the common core of both *háishi* and *huòzhe*. Following von Stechow 1991 (p. 53), JP's alternative set denotation is the union of its disjuncts' alternative set denotations. The ordinary semantic value of JP is undefined.

(4) **The semantics of J:**

a. $[\![\mathrm{J}\, x_1, ..., x_n]\!]^{\mathrm{o}}$ undefined

b. $[\![\mathrm{J}\, x_1, ..., x_n]\!]^{\mathrm{alt}} = [\![x_1]\!]^{\mathrm{alt}} \cup ... \cup [\![x_n]\!]^{\mathrm{alt}}$

J here is defined for an arbitrary number of arguments, although in most examples here I will illustrate its use with two disjuncts. For example, consider the disjunction of two NPs of type *e*, Li Si and Wang Wu, as in the examples in (1a) above. Here I assume both disjuncts to not bear focus,[4] and therefore $[\![\text{Lǐ Sì}]\!]^{\mathrm{alt}} = \{\text{Li Si}\}$ and $[\![\text{Wáng Wǔ}]\!]^{\mathrm{alt}} = \{\text{Wang Wu}\}$.

(5) a.
$$\left[\!\!\left[\begin{array}{c} \text{JP} \\ \overbrace{\text{NP} \quad \text{J} \quad \text{NP}} \\ \text{Lǐ Sì} \qquad \text{W. Wǔ} \end{array} \right]\!\!\right]^{\mathrm{o}} \text{ undefined}$$
b.
$$\left[\!\!\left[\begin{array}{c} \text{JP} \\ \overbrace{\text{NP} \quad \text{J} \quad \text{NP}} \\ \text{Lǐ Sì} \qquad \text{W. Wǔ} \end{array} \right]\!\!\right]^{\mathrm{alt}} = \{\text{Li Si}, \text{Wang Wu}\}$$

Hamblin 1973, makes the term "focus-semantic value" somewhat misleading, so I use the notation $[\![\alpha]\!]^{\mathrm{alt}}$ here, following more recent work such as Beck 2007, 2016. I write syncategorematic entries here for alternative-generating lexical items such as J in (4) and for alternative-sensitive operators such as the existential operators in (15–16) below.

[4] The denotation for J in (4) predicts JP with focused or focus-containing disjuncts to potentially include other, unnamed individuals in its alternative set. For example, $[\![_{\mathrm{JP}} [\mathrm{LS}]_{\mathrm{F}}\, \mathrm{J}\, [\mathrm{WW}]]\!]^{\mathrm{alt}} = [\![[\mathrm{LS}]_{\mathrm{F}}]\!]^{\mathrm{alt}} \cup [\![\mathrm{WW}]\!]^{\mathrm{alt}} = \{\text{ZS}, \text{LS}, \text{WW}, ...\}$, because the focused left disjunct will include other alternatives to Li Si besides Wang Wu. This is an unwelcome result. Fortunately, structures of this form are independently ruled out by a pragmatic economy constraint adapted from Buccola and Spector 2016, as suggested by an anonymous reviewer and also discussed and adopted in Kotek 2019: 46:

(i) An LF φ containing a focused expression A is infelicitous if, for some B distinct from A, φ is truth-conditionally equivalent to $\varphi[A \to B]$ (the result of substituting B for A in φ).

Concretely, we predict that $[_{\mathrm{JP}} [\mathrm{LS}]_{\mathrm{F}}\, \mathrm{or}_{\mathrm{J}}\, [\mathrm{WW}]]$ has the same interpretation as $[_{\mathrm{JP}} [\mathrm{ZS}]_{\mathrm{F}}\, \mathrm{or}_{\mathrm{J}}\, [\mathrm{WW}]]$, where we replace the focused constituent Li Si with one of its alternatives, Zhang San. Consequentially, structures of this form will be ruled out by (i).

Disjunctions where disjuncts appear to be focused or contain focus then must involve a "resetting" operator that interprets the focus in its scope, such as the $\sim$ operator of Rooth 1992. (I discuss this notion of "resetting" in section 2.2 below.) That is, structures of the form $[_{\mathrm{JP}} [\sim [\mathrm{LS}]_{\mathrm{F}}]\, \mathrm{or}_{\mathrm{J}}\, [\sim [\mathrm{WW}]_{\mathrm{F}}]]$ do not violate the constraint in (ii) and have the desired interpretation.

I thank an anonymous reviewer for suggesting the denotation for J in (4) and for bringing Buccola and Spector 2016 to my attention.

As a reviewer notes, both *háishi* and *huòzhe* disjunctors can appear more than once in a disjunction of three or more disjuncts. Example (6) illustrates this for the interrogative disjunctor *háishi*.[5] The simple set disjunction semantics for J in (4) extends to these cases as well, as illustrated by the tree in (7) below, which reflects the complex disjunction in example (6) below, with alternative set denotations indicated for each node.

(6) **Disjunctions with multiple disjunctors:** (Li and Thompson, 1981: 535)

Tā   jīntiān (*háishi*) míngtiān *háishi* hòutiān   lái?
3sg today   IDISJ   tomorrow IDISJ day.after.tomorrow come
'Is he/she coming today, tomorrow, or the day after?'

(7)
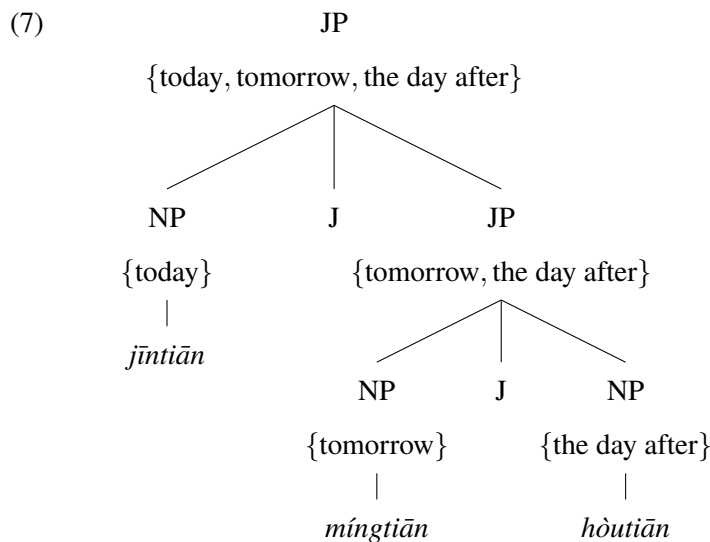
Alternatives introduced by J will compose *pointwise* with other material in the clause. The tree in (9) illustrates the VP in (8) with the subject in its VP-internal position[6] — following the predicate-internal subject hypothesis for Mandarin (see e.g. Huang, 1993; Shyu, 1995; Lin, 1998a) — with alternative sets and the types of their elements indicated at each node. I give extensional formulations here for ease of presentation.

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[5] The same sort of structure is possible with the standard disjunctor *huòzhe* as well, but disjunctors cannot be mixed within a single complex disjunction. I propose that this restriction is enforced syntactically, either via selectional restriction (JP sisters of *háishi* must themselves be headed by *háishi*, and mutatis mutandis for *huòzhe*) or as a variety of agreement or concord.

[6] I use the label VP here as shorthand for the full predicative domain with all of its predicate-internal arguments saturated, which is often called *v*P, VoiceP, or PredP in contemporary syntactic work. Following the basic compositional model as in Heim and Kratzer 1998, without events, what I call VP is always the lowest node in the clausal spine with extensional type *t*.

(8) Zhāng Sān xǐhuān Lǐ Sì *háishi/huòzhe* Wáng Wǔ

Zhang San like Li Si ɪDɪSJ/SDɪSJ Wang Wu

háishi: 'Does Zhang San like Li Si or Wang Wu?' (alternative question)

huòzhe: 'Zhang San likes Li Si or Wang Wu.' (declarative)

(9)
$$\text{VP}_t$$
$$\left\{ \begin{array}{l} \textbf{like}(ZS, LS), \\ \textbf{like}(ZS, WW) \end{array} \right\}$$

$$\text{NP}_e \qquad \text{V'}_{\langle e,t\rangle}$$
$$\{\text{Zhang San}\} \quad \left\{ \begin{array}{l} \lambda y \,.\, \textbf{like}(y, LS), \\ \lambda y \,.\, \textbf{like}(y, WW) \end{array} \right\}$$

$$\text{V}_{\langle e,\langle e,t\rangle\rangle} \qquad \text{JP}_e$$
$$\{\lambda x \,.\, \lambda y \,.\, \textbf{like}(y, x)\} \quad \{\text{Li Si, Wang Wu}\}$$
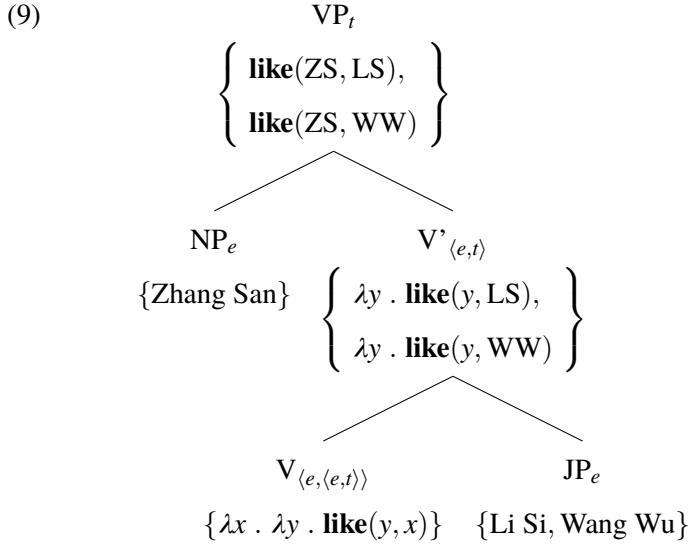
As reflected in (9), the alternative set for a branching node with daughters β and γ is computed by crossing each denotation in $[\![\beta]\!]^{\text{alt}}$ with each denotation in $[\![\gamma]\!]^{\text{alt}}$ and composing them using the appropriate rule of composition, e.g. function application. Each alternative in $[\![JP]\!]^{\text{alt}}$ of type e thus corresponds to an alternative of propositional type in $[\![VP]\!]^{\text{alt}}$. The subject subsequently moves to its canonical subject position in Spec,TP, not illustrated here.

Previous work such as Winter 1995, 1998, Aloni 2003, 2007, Simons 2005, Alonso-Ovalle 2006, Szabolcsi 2013, 2015 share the idea that disjunction collects a set of alternatives that then lead to the computation of corresponding alternatives at higher levels of structure via pointwise composition. However, these previous proposals are couched in a one-dimensional Hamblin semantics. My proposal for J in (4) is a particular implementation of this idea within Rooth's two-dimensional Alternative Semantics.

Note that the node JP in (9) does not have an ordinary semantic value, as defined in (4). The nodes V' and VP, which are dependent on the denotation of JP, will therefore also have undefined ordinary values. This lack of an ordinary semantic value will need to be addressed by the end of the derivation, in order to satisfy Interpretability (3). Some higher alternative-sensitive operator must construct an ordinary semantic value based on the alternatives, so that the utterance root can be interpreted. This will happen in one of two ways: either an existential operator quantifies over these alternatives, resulting in their boolean disjunction, or the alternatives are used to form a question, with each alternative corresponding

to a possible answer.

2.1 Alternative questions with *háishi*

We first discuss the use of *háishi*, which in the basic case reflects the use of J (4) above without further modification. Consider the basic alternative question example (1a) from above, repeated here as (10).

(10) **Alternative question with *háishi*: =(1a)**

[$_{TP}$ Zhāng Sān xǐhuān [$_{JP}$ Lǐ Sì *háishi* Wáng Wǔ]] (ne)?
    Zhang San like   Li Si IDISJ Wang Wu   NE
'Does Zhang San like Li Si or Wang Wu?'

The semantic denotation for the TP clause in (10), modulo the contribution of tense/aspect semantics which I do not consider here, is equal to the denotation of the VP illustrated in (9) above. The alternative set contains two propositions, which I intensionalize here, corresponding to Zhang San liking Li Si and Zhang San liking Wang Wu. Its ordinary semantic value is undefined:

(11) a. $[\![TP]\!]^o$ undefined   b. $[\![TP]\!]^{alt} = \{{}^{\wedge}\mathbf{like}(ZS, LS),\ {}^{\wedge}\mathbf{like}(ZS, WW)\}$

The sentence-final particle *ne* is often included in Mandarin alternative questions, as in (10) above. I discuss the behavior of *ne* in Appendix A, but for our current discussion, it suffices to note that this sentence-final particle *ne* is independent of the utterance's interrogative force and is part of the CP layer of the clause (see e.g. Constant, 2014; Paul, 2014). I will then simply treat the full CP as semantically identical to the TP: $[\![CP]\!] = [\![TP]\!]$.

Recall that a complete utterance is interpreted as its ordinary semantic value, which must also be a member of its alternative set denotation. The TP/CP here fails to satisfy this requirement of Interpretability (3). We need an operator that defines an ordinary semantic value—in this case of a question—based on the denotation in (11). Beck proposes a question operator Q for this purpose, with the syncategorematic entry in (12). As discussed by Kotek (2019), Q (her AltShift) cannot apply to a sister that already has a defined ordinary value.

(12) **Beck's question operator Q:**   (from Beck, 2006: 16; also called AltShift in Kotek 2019: 32)

a. $[\![Q\ \alpha]\!]^o = [\![\alpha]\!]^{alt}$

b. $[\![Q\ \alpha]\!]^{alt} = \{[\![Q\ \alpha]\!]^o\} = \left\{[\![\alpha]\!]^{alt}\right\}$

c. $[Q\ \alpha]$ presupposes that $[\![\alpha]\!]^o$ is undefined.

Its application to the CP built from (11) results in a set of propositions as its ordinary semantic value, each corresponding to different possible answers, i.e. a question denotation (Hamblin, 1973):

(13) a. $[\![Q\ CP]\!]^o = \{{}^{\wedge}\mathbf{like}(ZS, LS),\ {}^{\wedge}\mathbf{like}(ZS, WW)\}$

 b. $[\![Q\ CP]\!]^{alt} = \{\{{}^{\wedge}\mathbf{like}(ZS, LS),\ {}^{\wedge}\mathbf{like}(ZS, WW)\}\}$

The idea that an operator, Q, "lifts" a set from the alternative dimension into the ordinary dimension is a foundational part of the compositional semantics of *wh*-words and *wh*-questions in Rooth-Hamblin Alternative Semantics, developed in Beck 2006 and Kotek 2014, 2016, 2019. In these works, *wh*-phrases have no ordinary semantic value but take the set of individuals in their domain as their alternative denotations, as independently proposed earlier by Ramchand (1997):

(14) a. $[\![who]\!]^o$ undefined   b. $[\![who]\!]^{alt} = \{x : x\ \text{animate}\} = \{ZS, LS, WW, ...\}$

A clause including 'who' will end up with a denotation akin to our (11) above: no ordinary semantic value, but a non-singleton set of propositions as its alternative set. The application of Q to this structure yields an interpretable *wh*-question. Beck and Kim 2006 extends this approach to the interpretation of alternative questions, with disjunctions projecting alternatives that are interpreted by Q, which is a precursor to my analysis of *háishi* alternative questions. In the discussion that follows, we will see further parallels between *háishi* disjunctions and *wh*-phrases in Mandarin that support this parallel analysis.

Finally, I note that I will ultimately argue that some but not all speakers treat *háishi* as syntactically requiring association with Q. Evidence for this position will come from patterns of non-interrogative uses of *háishi* in section 4.

2.2 Logical disjunctions with *huòzhe*

Next, I discuss the application of existential closure over the alternatives introduced by J, which I propose the standard disjunctor *huòzhe* to require. Here I introduce two variants of an abstract, unary existential closure operator $\exists_{reset}$ and $\exists_{pass}$ in (15–16) below. The two operators differ in the resulting alternative set denotation that they provide: $\exists_{reset}$ returns the singleton set of its ordinary value as the new alternative set, in (15b) — an effect which Beck (2006) describes as "resetting" — whereas $\exists_{pass}$ simply passes up its sister's alternative set, in (16b).

(15) **The resetting existential operator:**

    a. $[\![\exists_{\text{reset}}\, \alpha]\!]^{\text{o}} = \bigvee [\![\alpha]\!]^{\text{alt}}$

    b. $[\![\exists_{\text{reset}}\, \alpha]\!]^{\text{alt}} = \left\{ \bigvee [\![\alpha]\!]^{\text{alt}} \right\}$

(16) **The passing existential operator:**

    a. $[\![\exists_{\text{pass}}\, \alpha]\!]^{\text{o}} = \bigvee [\![\alpha]\!]^{\text{alt}}$

    b. $[\![\exists_{\text{pass}}\, \alpha]\!]^{\text{alt}} = [\![\alpha]\!]^{\text{alt}}$

I propose that *huòzhe* is the realization of a J head — with the semantics in (4) — with a syntactic requirement for a corresponding $\exists_{\text{reset}}$ or $\exists_{\text{pass}}$ that quantifies over its alternatives. I also propose that $\exists_{\text{reset}}$ cannot be freely adjoined in the absence of a trigger such as the *huòzhe* J head that requires it, which will become important in the following section. (In contrast, I will argue that $\exists_{\text{pass}}$ *can* be adjoined without a trigger, as I describe and motivate in section 4.2.) I encode this requirement with the uninterpretable feature [u∃] on the J pronounced *huòzhe*, which must be checked by Agree with $\exists_{\text{reset}}$ or $\exists_{\text{pass}}$.[7]

I furthermore propose that $\exists$ operators adjoin to nodes of propositional type, as in the framework of Kratzer and Shimoyama 2002.[8] We first consider $\exists_{\text{reset}}$, which yields the correct result for examples with a simple disjunction interpretation, such as example (8) with *huòzhe*. The adjunction of $\exists_{\text{reset}}$ at the VP level, based on (9) above, results in the two-dimensional denotation in (17). Notice that this result satisfies the requirement of Interpretability (3), that $[\![\exists_{\text{reset}}\ \text{VP}]\!]^{\text{o}}$ is defined and is a member of $[\![\exists_{\text{reset}}\ \text{VP}]\!]^{\text{alt}}$.

(17)   a. $[\![\exists_{\text{reset}}\ \text{VP}]\!]^{\text{o}} = \textbf{like}(\text{Zhang San}, \text{Li Si}) \vee \textbf{like}(\text{Zhang San}, \text{Wang Wu})$

        b. $[\![\exists_{\text{reset}}\ \text{VP}]\!]^{\text{alt}} = \{ \textbf{like}(\text{Zhang San}, \text{Li Si}) \vee \textbf{like}(\text{Zhang San}, \text{Wang Wu}) \}$

Recall as well that the operator Q which forms alternative questions cannot apply to a structure such as (17), as it already has a defined ordinary value. The result of *huòzhe* with associated $\exists_{\text{reset}}$, as in (17), will therefore necessarily be a logical disjunction, not an alternative question.[9]

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[7] This follows the syntactic treatment of various types of specialized indefinites (e.g. polarity items, free choice items, modal indefinites, etc.) in Kratzer and Shimoyama 2002, Chierchia 2013 (see for example discusison on page 168), and subsequent work. Tsai (2015a) also suggests a similar syntactic feature for *huòzhe* (p. 62). See also Meertens 2021 ch. 8. Note that Agree itself can be long-distance, without syntactic locality restrictions (see e.g. Bošković, 2007; Keine, 2020).

[8] It is also theoretically possible to define existential operators such as $\exists_{\text{reset}}$ and $\exists_{\text{pass}}$ to apply to constituents of non-propositional but conjoinable types, using 'join' (see e.g. Partee and Rooth, 1983). The resulting phrases would then have to take scope via a mechanism such as Quantifier Raising (QR). The proposal for *huòzhe* standard disjunction in Erlewine 2014 also has this effect; see p. 223 note 5 there. I argue later in this section as well as in section 3 that the scope of *huòzhe* disjunction does not pattern as though it is the result of scope-taking movement, contra such QR-based approaches.

[9] *Huòzhe* disjunction may however appear in polar questions, whose question radical is a disjunctive proposition; see (i). Concretely, we could assume the polar question particle (PolQ) *ma* has a semantics as in (ii), which requires its sister to have a defined ordinary value. This necessitates the use of $\exists_{\text{reset}}$ as with *huòzhe* before PolQ applies.

(i) Zhāng Sān xǐhuān Lǐ Sì *huòzhe* Wáng Wǔ ma?   (based on Dong, 2009: 74)
    Zhang San like   Li Si sᴅɪsᴊ Wang Wu PolQ
    'Does Zhang San like either of Li Si or Wang Wu?'

(ii) a. $[\![\textsc{PolQ}]\!]^{\text{o}} = \lambda p_{\langle s,t \rangle} \cdot \{ p, \neg p \}$ $[\![\textsc{PolQ}]\!]^{\text{alt}} = \{ [\![\textsc{PolQ}]\!]^{\text{o}} \}$

The denotation in (ii) produces a bipolar question denotation, $\{ p, \neg p \}$, following Hamblin 1973: 50. I note that Krifka (2015) proposes that "*p ma*" denotes the monopolar $\{ p \}$ but see Yuan and Hara 2019 for discussion and defense of the bipolar approach.

Next, we consider the use of $\exists_{pass}$ to satisfy the [u$\exists$] feature of *huòzhe*. The application of $\exists_{pass}$ results in the denotation in (18). As noted above, I propose that both $\exists_{reset}$ and $\exists_{pass}$ satisfy the syntactic [u$\exists$] requirement of *huòzhe*. However, we notice that (18) does *not* satisfy Interpretability, and therefore by itself is not a grammatical structure. I will argue that the availability of $\exists_{pass}$ will be useful for explaining the behavior of environments that license non-interrogative uses of *wh*-phrases and (for some speakers) *háishi* disjunction, in section 4.2 below, but concentrate on $\exists_{reset}$ for the remainder of this section.[10] I note as well that Q cannot apply to form an alternative question from the result of $\exists_{pass}$ as in (18), as the ordinary value is defined, just as Q cannot apply to the result of $\exists_{reset}$ as in (17) above.

(18) a. $[\![\exists_{pass} \text{ VP}]\!]^o = \textbf{like}(\text{Zhang San}, \text{Li Si}) \vee \textbf{like}(\text{Zhang San}, \text{Wang Wu})$

b. $[\![\exists_{pass} \text{ VP}]\!]^{alt} = \{ \textbf{like}(\text{Zhang San}, \text{Li Si}), \textbf{like}(\text{Zhang San}, \text{Wang Wu}) \}$

I return now to the basic case with $\exists_{reset}$ in (17) above. As noted above, the subject (here, Zhang San) moves from its predicate-internal position to the surface subject position in Spec,TP. See (19). There are therefore multiple positions of propositional type that $\exists_{reset}$ could adjoin to. Although this choice of adjunction position does not make an interpretational difference in (19), it can potentially lead to scope ambiguities in more complex sentences.

(19) [$_{TP}$ Zhang San [λx ... [$_{VP}$ x like [$_{JP}$ Li Si *huòzhe*$_J$ Wang Wu]]]]

Consider the examples in (20) below with a quantificational subject or negation. Both sentences are scopally ambiguous in terms of whether the standard disjunction in object position takes scope above or below the higher material. I propose that such contrasts reflect different adjunction positions for $\exists_{reset}$, for instance to TP or VP as in (19) above.

(20) **Object *huòzhe* disjunction leading to scope ambiguities:**

a. Zài jiǔhuì, { měi-gè rén / hěn-duō rén } chī-le shòusī *huòzhe* yìdàlìmiànshí.
    at party   every-CL person   very-many person   eat-PFV sushi SDISJ pasta
    'At the party, {everyone / many people} ate sushi or pasta.'
    (everyone/many > or, or > everyone/many)   (based on Crain, 2012: 258)

---

[10] Both forms of disjunctive denotations — reflecting the application of $\exists_{reset}$ and $\exists_{pass}$ in the terms here — are attested in prior work on disjunction in a two-dimensional Alternative Semantics, although this difference has not been explicitly discussed before. For example, the effect of disjunction as proposed in Uegaki 2018 (p. 20) is "resetting" in the sense here, whereas disjunction phrases in von Stechow 1991: 53ff, Romero and Han 2003, and Beck and Kim 2006 project their individual disjuncts as their alternative set denotations.

b. Zhè-lù   chē bù tíng fǎyuàn   *huòzhe* túshūguǎn.
   this-route bus NEG stop courthouse SDISJ   library

   'This bus doesn't stop at the courthouse or the library.'

   (not > or, or > not)   (Jing, 2008: 169–170)

For sentences such as (20b) with standard disjunction in object position with clausemate negation, many prior works report that the wide scope disjunction reading (or > not) is dominant for adult Mandarin speakers, in contrast to the narrow scope disjunction reading which is dominant for the corresponding English structure as well as for Mandarin-acquiring children. See, for example, Jing et al. 2005; Crain 2012; Crain and Thornton 2012; Notley et al. 2012. However, Jing (2008) argues that both scopes are possible in sentences such as (20), especially when supported by explicit disambiguating continuations as in (21) below. See also Liu and Chen 2017 for an experimental study showing that adults interpret structures with object *huòzhe* disjunction and clausemate *méi* negation as scopally ambiguous as well.

(21) **Disambiguating continuations for (20b):**   (Jing, 2008: 169–170)

   a. <u>Continuation supporting "not > or" parse for (20b):</u>

   Rúguǒ nǐ   yào qù zhè liǎng-gè dìfāng, yào huán yī-lù   chē.
   if   2sg need go this two-CL place   need change one-route bus

   'If you need to go to (either of) these two places, you need to change to another bus.'

   b. <u>Continuation supporting "or > not" parse for (20b):</u>

   Dàn wǒ bù jìdé   tā bù tíng nǎ   zhàn le.
   but 1sg NEG remember 3sg NEG stop which stop LE

   'But I don't remember which one it doesn't stop at.'

It is important to note that the scope ambiguities observed in examples such as (20a,b) argue against an approach where the standard disjunction *huòzhe* forms quantificational phrases that then take scope as other object quantifiers do, for instance via Quantifier Raising (QR) or a similar mechanism. Mandarin Chinese is well known as a scope-rigid language (see e.g. Huang, 1982; Aoun and Li, 1989). In particular, experimental studies confirm that universal quantifiers in object position cannot scope over quantificational subjects (Scontras et al., 2017) nor over negation (Fan, 2017) for most Mandarin-speaking adults. The scope-taking behavior of standard disjunction as in (20a,b) is thus better modeled as reflecting flexibility in the adjunction positions of $\exists_{\text{reset}}$, as I propose here. I also present additional evidence on the

scope-taking behavior of standard disjunction *huòzhe* which will further motivate this approach in section 3 below.

2.3 Summary

I propose that the standard disjunctor *huòzhe* and the interrogative disjunctor *háishi* share a basic syntax as a junction head J, which can take disjuncts of different categories and sizes. Adopting the two-dimensional framework of Rooth-Hamblin Alternative Semantics, J has the semantics of a set-union operator in its alternative set dimension, resulting in an alternative set denotation for JP as the set of its disjuncts' denotations. The JP then composes pointwise with additional syntactic material above it. This results in JP-containing VP and TP meanings that have an alternative set denotation as a set of propositions, but no defined ordinary value, which then cannot be interpreted without a higher interpreting operator.

I presented two different ways that JP-containing clauses can be productively interpreted. The first is with the operator Q (as in Beck, 2006; Beck and Kim, 2006; Kotek, 2019), resulting in an alternative question denotation. The second is with the existential operator $\exists_{\text{reset}}$ which results in an interpretable disjunctive proposition. (I also introduced a variant, $\exists_{\text{pass}}$, which I motivate and further discuss in section 4.2 below.) I propose that the standard disjunctor *huòzhe* bears a syntactic feature [u∃] requiring an associated ∃ operator, which in turn blocks the application of Q to evaluate its alternatives to form a question. In turn, I propose that the interrogative disjunctor *háishi* lacks this feature and that adjunction of $\exists_{\text{reset}}$ must be motivated, thereby leaving interpretation with Q as an alternative question as the only viable path for its interpretation, in simple cases. This derives the observed one-to-one correlation between disjunction form and clause type in simple cases. In addition, *háishi* could also have a syntactic feature [uQ] to enforce its interpretation by Q; I will argue in section 4 below that some but not all Mandarin speakers do so.

3 Motivating evidence

I now elaborate on various details regarding the behavior and interpretation of the two disjunctors, which serve to motivate my particular proposal above in relation to possible alternative accounts, including those in prior literature. I will show that both forms of disjunction are insensitive to syntactic islands (§3.1) but are subject to so-called focus intervention effects (§3.2). Island-insensitivity serves to argue against analyses of both forms of disjunction that involve covert movement for their scope-taking, as J. Huang (1982) originally proposed for *háishi*. I will emphasize as well that the two forms of disjunction

neatly parallel one another in their insensitivity to syntactic islands and sensitivity to focus intervention, supporting my approach where both disjunctors project alternatives, in the same manner, up to their interpreting operators.

3.1 Island insensitivity

The study of the syntax and semantics of Mandarin Chinese has played a starring role in early discussions of covert movement. As Mandarin Chinese is a *wh*-in-situ language, James Huang (1982) argued that some *wh*-words move covertly to the corresponding interrogative complementizer at Logical Form (LF) without affecting the word order. These movements, although not reflected in word order, are nonetheless detected by their sensitivity to island constraints on movement (Ross, 1967).

James Huang also suggested in passing in this early work that *háishi* alternative questions may involve covert movement of *háishi* to the interpreting complementizer (Huang, 1982: 276);[11] concretely, we might imagine this to suggest that the entire *háishi*-headed JP moves covertly. However, he later argued against the idea of covert movement for *háishi* after demonstrating that *háishi* disjunction is *not* sensitive to syntactic islands (J. Huang, 1991). That is, in the terms of my account here, JP headed by the interrogative disjunctor can be embedded inside an island and still lead to the interpretation of a surrounding clause as an alternative question. Here I reproduce a few of James Huang's examples involving sentential subject islands and relative clause islands in (22–23) below, supplemented with examples from Ray Huang's work demonstrating insensitivity to complex NP islands and adjunct islands in (24–25). All of these examples are alternative questions. The relevant island structures and *háishi* JPs are indicated below.

(22) **Interrogative disjunction is not sensitive to sentential subject islands:** (J. Huang, 1991: 313)

    a. [$_{island}$ Wǒ [$_{JP}$ [qù měiguó] *háishi* [bú qù měiguó]]] bǐjiào hǎo?

             1sg   go America IDISJ NEG go America comparatively good

      'Is it better for me to go to America or to not go to America?'

    b. [$_{island}$ [$_{JP}$ Wǒ *háishi* nǐ] qù měiguó] bǐjiào hǎo?

               1sg IDISJ 2sg go America comparatively good

      'Is it better for me to go to America or for you to go to America?'

---

[11] This suggestion appears to be intended as just one possible analysis, however, with another being that *háishi* coordinates disjuncts of clausal size which undergo Conjunction Reduction; see his example (221) and preceding prose on page 276. I discuss and argue against this alternative approach in Appendix A.

(23) **Interrogative disjunction is not sensitive to relative clause islands:**

a. Nǐ xǐhuān [[island ___ [JP [zūnzhòng nǐ] *háishi*   (J. Huang, 1988a: 688)

    2sg like   respect 2sg IDISJ

    [bù zūnzhòng nǐ]] de] rén]?

     NEG respect 2sg DE person

    'Do you like people who respect you or people who don't respect you?'

b. Nǐ xǐhuān [[island [JP Zhāng Sān *háishi* Lǐ Sì] xiě ___ de] shū]? (R. Huang, 2010a: 123)

    2sg like   Zhang San IDISJ Li Si write   DE book

    'Do you like the books that Zhang San wrote or the books that Li Si wrote?'

(24) **Interrogative disjunction is not sensitive to complex NP islands:** (R. Huang, 2010a: 125–126)

a. Nǐ xiāngxìn [[island Xiǎodí shì [JP [yīnwèi qiàn zhài] *háishi* [yīnwèi shī liàn]]

    2sg believe   Xiaodi SHI because owe debt IDISJ because lose romance

    ér zìshā de] shuōfǎ] ne?

    so suicide DE story NE

    'Do you believe the story that Xiaodi committed suicide because of owing debt or because of failing at love?'

b. Nǐ xiāngxìn [[island [JP [tā dé jiǎng] *háishi* [wǒ dé jiǎng] de] xiāoxi] ne?

    2sg believe   3sg get prize IDISJ 1sg get prize DE news NE

    'Do you believe the news that he/she won the prize or that I won the prize?'

(25) **Interrogative disjunction is not sensitive to adjunct island:** (R. Huang, 2020: 211)

Nǐ [island zài Zhāng Sān [JP [kāi-le dēng] *háishi* [guān-le dēng]] zhīhòu] cái

2sg   at Zhang San turn.on-PFV light IDISJ turn.off-PFV light after then

jìn fángjiān?

enter room

'Did you enter the room after Zhang San turned on the light or after Zhang San turned off the light?'

    Wh-in-situ in Mandarin Chinese exhibits an argument/adjunct asymmetry, whereby only *wh*-adjuncts exhibit sensitivity to island effects (Huang, 1982). But we note that the island insensitivity of *háishi* interrogative disjunction is not contingent on the type of material that the JP represents. We see that

interrogative disjunctions of arguments (as in (22b) and (23b)), adjuncts (as in (24a)), as well as of clausal/verbal extended projections (as in (22a), (23a), (24b), and (25)) are all insensitive to syntactic islands.

This is not to say that the embedding of interrogative disjunction is entirely unconstrained. R. Huang (2010a: 138, 2010b: 227) and He (2011) show that interrogative disjunction is ungrammatical inside an appositive relative clause, as in (26a). Note that the interrogative disjunction in (26a) is contained within a prenominal relative clause which itself appears to be equivalent to that in the grammatical (23b) above, but here it precedes a demonstrative-marked NP, which already denotes a unique individual. Example (26b) shows that it is possible to form an alternative question with two disjuncts that appear to differ only in the content of their appositive relative clauses, although in this case the intended reading involves a choice between two different books.

(26) **Interrogative disjunction ungrammatical in appositive relative clause:** (He, 2011: 90)

    a.   *Nǐ zuì   xǐhuān [_{appositive} [_{JP} Zhāng Sān *háishi* Lǐ Sì] xiě ___ de] nà-běn shū?

        2sg most like   Zhang San IDISJ Li Si write   DE that-CL book

        literally: 'Do you like that book, which Zhang San or Li Si wrote, the most?'

    b.   [_{JP} [Nǐ zuì   xǐhuān [_{appositive} Zhāng Sān xiě   ___ de] nà-běn shū] *háishi*

             2sg most like   Zhang San write   DE that-CL book IDISJ

         [nǐ zuì   xǐhuān [_{appositive} Lǐ Sì xiě   ___ de] nà-běn shū]]?

         2sg most like   Li Si write   DE that-CL book

        'Do you like that book, which Zhang San wrote, the most or do you like that (other) book, which Li Si wrote, the most?'

Del Gobbo (2010: 403–405, 2015: 76–78) has shown that various other question-introducing constructions are ungrammatical in Mandarin appositive relatives. This restriction appears to reflect a more general constraint that appositive content is not at-issue (see e.g. AnderBois et al., 2015), i.e. does not address or raise new questions under discussion, although certain exceptions are reported in some other languages; I refer the interested reader to discussions in these works and the citations there.

In summary, the interpretation of *háishi* interrogative disjunction leading to an alternative question is insensitive to classic syntactic islands, which are diagnostic of syntactic movement, but they dpexhibit restrictions based on their semantics. This supports my proposal whereby *háishi* interrogative disjunctions do not undergo movement in alternative questions, contrary to the early suggestion by J. Huang

(1982: 276).[12]

I now turn to the interpretation of *huòzhe* standard disjunctions, which under my account should echo *háishi* interrogative disjunctions in their interpretational possibilities under embedding. Under my account, the core difference between declaratives with *huòzhe* and structurally parallel alternative questions with *háishi* is that the former involves a covert operator $\exists_{\text{reset}}$ to interpret the disjunction's alternatives, whereas the latter has Q as the corresponding operator. The structural position of $\exists_{\text{reset}}$ determines the scope that the *huòzhe* standard disjunction can be described to take.

In contrast to the above discussion of *háishi* alternative questions, to my knowledge no prior work has systematically investigated the interaction of *huòzhe* standard disjunction and syntactic islands. Consider examples (27–28) below. A *huòzhe* standard disjunction is embedded within a sentential subject island in the first sentence in (27) and within a relative clause island in (28). These target sentences are followed by disambiguating continuations of the form discussed in Jing 2008 (see (21b) above), which are incompatible with parses of the preceding sentences where disjunction takes scope within their respective islands. The continuations in both (27) and (28) are judged to be felicitous, which indicates that it is possible for the disjunctions in their first sentences to descriptively scope out of their islands.

(27) **Standard disjunction is not sensitive to sentential subject islands:**

[island Zhāng Sān kǎo-guò [JP wùlǐ *huòzhe* huàxué]] shǐ tā māmā fēicháng jīngyà,
Zhang San test-EXP Physics SDISJ Chemistry make 3sg mother extremely surprised

dàn wǒ bù zhīdào jùtǐ shì nǎ-mén kè ràng tā māmā nàme jīngyà.
but 1sg NEG know concretely COP which-CL subject make 3sg mother so surprised

'That Zhang San passed Physics or Chemistry made his mother extremely surprised, but I don't know exactly which subject it was (that he passed) that made his mother so surprised.'

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[12] More recently, R. Huang (2020) has proposed that Mandarin alternative questions *do* involve covert movement, but with the possibility of large covert pied-piping, thereby obscuring any island sensitivity. The description there makes the proposed covert movement difficult to detect or falsify. R. Huang (2020) furthermore does not provide a compositional semantics, alluding only to syntactic feature percolation between the disjunctor and the covertly moved phrase.

(28) **Standard disjunction is not sensitive to relative clause islands:**

Wǒ zhīdào tā mǎi-le [yī-běn [_island_ [_JP_ Zhāng Sān *huòzhe* Lǐ Sì] xiě ___] de shū],

1sg know 3sg buy-PFV one-CL Zhang San SDISJ Li Si write DE book

dànshì wǒ bù zhīdào shì Zhāng Sān háishi Lǐ Sì xiě de.

but 1sg NEG know COP Zhang San IDISJ Li Si write DE

'I know he/she bought a book that Zhang San or Li Si wrote, but I don't know if it was the one that Zhang San or Li Si wrote.'

On my account here, this scope-taking reflects the adjunction position of $\exists_{\text{reset}}$ in the matrix clauses, with alternatives introduced by the *huòzhe* disjunction JPs composing pointwise with the material in the island and above, up to $\exists_{\text{reset}}$. This propagation of alternatives is not sensitive to syntactic islands. These examples additionally serve to show that the relationship between *huòzhe* and its corresponding $\exists$ operator is not restricted by intervening clause boundaries; see note 7 above on a related syntactic detail.

Finally, I note that Erlewine (2014: 226) and R. Huang (2020: 234) report that *háishi* interrogative disjunction is sensitive to *wh*-islands; that is, *háishi* inside an embedded question cannot scope out to itself raise a matrix alternative question. I discuss such effects in Appendix B, where I show that they are more complicated than what has been described in these prior works. Importantly, however, the restrictions on alternative question formation with *háishi* again parallel restrictions on the scope-taking with *huòzhe* standard disjunction in the same environments, again supporting my overall account.

In summary, I have shown that the scope-taking behavior of the standard disjunction is thus insensitive to these syntactic islands, just as we saw that *háishi* interrogative disjunction is. Neither the interpretation of *háishi* interrogative disjunction in an alternative question nor the disjunctive interpretation introduced by *huòzhe* standard disjunction involves covert movement for their scope-taking. Instead, both forms of disjunction are interpreted in-situ at LF, introducing alternatives which compose pointwise with material above them. This projection of alternatives is not sensitive to syntactic barriers such as islands, but is subject to certain interpretational constraints, as we saw with the appositive data in (26) and we see with some *wh*-islands in Appendix B. Next we discuss further evidence for both forms of disjunction being sensitive to semantic constraints in the form of so-called focus intervention effects.

3.2 Focus intervention effects

Although the projection of alternatives in Rooth-Hamblin Alternative Semantics is insensitive to syntactic barriers, it has been argued to be susceptible to so-called *focus intervention effects* (Beck, 2006; Beck and Kim, 2006, and others). In this section, building on observations reported in Erlewine 2014 and Li

and Law 2016, I will show that both *háishi* interrogative disjunction in alternative questions as well as the scope-taking possibilities of *huòzhe* standard disjunction are susceptible to focus intervention effects. This again supports my proposal where both forms of disjunction share a common function of projecting alternatives from their surface position, which are then interpreted by corresponding alternative-sensitive operators Q and $\exists_{\text{reset}}$ in the basic cases.

So-called focus intervention effects most commonly refer to the relative ungrammaticality of *wh*-questions where an "intervener" intervenes between an in-situ *wh*-word and its interpreting operator, Q. Consider the contrast in (29) below. Even though Mandarin is a *wh*-in-situ language, the object *wh*-question in (29a) is judged as degraded due to the subject 'only.' However, if the *wh*-phrase is fronted across the subject as in (29b) or is pseudoclefted as in (29c), the question is grammatical with the intended interpretation.[13] This reflects the status of the pre-subject 'only' (in bold) as a problematic intervener. See also Yang 2008, 2012, Li and Cheung 2015, Li and Law 2016, among others, for further data and discussion of focus intervention effects in Mandarin Chinese *wh*-questions.

(29) **Focus intervention effect with subject 'only':** (a,b based on Kim, 2006: 166)

    a. $^{?}$*__Zhǐyǒu__ [Zhāng Sān]$_F$ kàn-le   *nǎ-běn*   *shū*   (ne)?
       only   Zhang San   read-PFV which-CL book NE

    b. (Shì) *Nǎ-běn*   *shū*, **zhǐyǒu** [Zhāng Sān]$_F$ kàn-le   *t* (ne)?
       SHI which-CL book only   Zhang San read-PFV   NE
       'Which book did only Zhang San read?'

    c. [**Zhǐyǒu** [Zhāng Sān]$_F$ kàn *t* de] shì *nǎ-běn*   *shū*   (ne)?
       only   Zhang San read   DE COP which-CL book NE
       'Which book is the one that only Zhang San read?'

In one prominent proposal, Kim (2002, 2006) and Beck (2006) argue that the problematic interveners in many languages share the property of being focus-sensitive operators. In the standard Roothian Alternative Semantics for focus particles, focus-sensitive operators such as 'only' have the effect of "resetting" their alternative sets, in the sense introduced in section 2.2 above, blocking the projection of the *wh*-phrase's alternatives up to the intended interpreting operator, Q, at the edge of the question. I comment further on one complication regarding focus intervention according to Beck's account at the end of this section, but for the discussion that follows, I will simply use focus intervention effects — especially

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[13] Cheung (2014) argues that the *shì* that often precedes fronted *wh*-phrases is the focus marker *shì* (see e.g. Huang, 1982, 1988b), rather than the copula. I therefore gloss *shì* as in (29b) as SHI but gloss *shì* in pseudoclefts such as (29c) as a copula, COP.

with intervening 'only' as in (29) — as a diagnostic for the projection of Rooth-Hamblin alternatives.

Beck and Kim (2006) show that such focus intervention effects also affect alternative questions in many languages. Example (30a) is ungrammatical as an alternative question in English, although the same alternative question without 'only' is grammatical. According to Beck and Kim, the disjunction projects alternatives, which must be interpreted by Q at the clause edge for its grammatical alternative question interpretation, but the presence of 'only' in (30a) blocks this projection. Similar to the contrast in (29) above, fronting the alternative source (here, the disjunction) out of the scope of the intervener as in (30b) results in a grammatical alternative question with the same intended interpretation.

(30) **Focus intervention in English alternative questions:**   (Beck and Kim, 2006: 167)

    a.   *Does **only** [John]$_F$ like [Mary *or* Susan]?

    b.   Is it [Mary *or* Susan] that **only** [John]$_F$ likes *t*?

Returning now to our Mandarin disjunctors, Erlewine (2014) shows that interrogative disjunction is subject to focus intervention effects, as in (31). As with the Mandarin *wh*-question (29) or the English alternative question (30), fronting the disjunction out of the scope of 'only' (31b) or pseudoclefting it (31c) results in grammatical alternative questions with the same intended interpretation. This suggests that the ungrammaticality of (31a) reflects a focus intervention effect of the Beck and Kim type, caused by a focus-sensitive operator hierarchically coming between the interrogative disjunction JP and its corresponding Q at the clause edge. Intervention in Mandarin alternative questions is also reported with the focus marker *shì* (He, 2011: 87; Erlewine, 2014: 228) and with the high negator *búshì* (R. Huang, 2020: 214), but here I concentrate on intervention with 'only.'

(31) **Focus intervention in Mandarin alternative questions:**

    a.   ***Zhǐyǒu** [Zhāng Sān]$_F$ chī-le   [$_{JP}$ píngguǒ *háishi* júzi   ] (ne)?   (Erlewine, 2014: 228)

           only   Zhang San   eat-PFV   apple   IDISJ   orange   NE

           Intended: 'Was it an apple or an orange that only Zhang San ate?'

    b.   Shì [$_{JP}$ píngguǒ *háishi* júzi   ], **zhǐyǒu** [Zhāng Sān]$_F$ chī-le   *t* (ne)?

           SHI   apple   IDISJ   orange   only   Zhang San   eat-PFV   NE

           'Was it an apple or an orange that only Zhang San ate?'

    c.   [**Zhǐyǒu** [Zhāng Sān]$_F$ chī   *t* de] shì [$_{JP}$ píngguǒ *háishi* júzi   ] (ne)?

           only   Zhang San   eat-PFV   DE   SHI   apple   IDISJ   orange   NE

           'Was what only Zhang San ate an apple or an orange?'

Another way that this intervention effect can be avoided is by using larger disjuncts which each individually contain the focus-sensitive operator, as in (32) below. In this case, although the contrasting constituents 'apple' and 'orange' are each in the scope of the intervener 'only,' there is no intervener between the JP and the edge of the clause. It is the region between the JP and the interpreting operator Q which is susceptible to intervention, explaining the difference between the local object disjunction in (31a) and the clausal disjunction in (32).

(32) **'Only' in each disjunct does not trigger intervention; cf (31a):**

[$_{JP}$ [Zhǐyǒu [Zhāng Sān]$_F$ chī-le píngguǒ (ne)] *háishi* [zhǐyǒu [Zhāng Sān]$_F$ chī-le júzi   (ne)]]?

only   Zhang San eat-PFV apple   NE IDISJ only   Zhang San eat-PFV orange NE

'Did only Zhang San eat-PFV an apple or did only Zhang San eat an orange?'

Next we turn to the scope-taking of *huòzhe* standard disjunction. Under my account, the scope-taking possibilities of standard disjunction in Mandarin should also be constrained by focus intervention effects: JPs headed by *huòzhe* project alternatives, just as those headed by *háishi* do, and must be interpreted by an existential operator (in the basic case, $\exists_{reset}$) which determines the scope of the disjunction.[14]

Crain (2012) reports that *huòzhe* standard disjunction cannot scope over subject 'only' as in example (33) below. We can verify that the wide scope disjunction reading is not available with the context described below, where the sentence should be judged to be felicitous and true if the wide scope disjunction reading — that only John ate an apple or only John ate a pear — were available, because in this situation, it is true that only John ate a pear. However, the sentence is judged as false for all but one of the speakers that I have consulted. Xie (2020: 17) also reports this same scope restriction in parallel sentences as well.

(33) **Scope of standard disjunction restricted by subject 'only':**   (Crain, 2012: 242–243)

Zhǐyǒu [Yuēhàn]$_F$ chī-le [$_{JP}$ píngguǒ *huòzhe* lí   ].

only   John   eat-PFV apple   SDISJ pear

'Only John ate an apple or a pear.' (only > or, *or > only)

<u>False</u> in context where John ate an apple and a pear and Mary ate an apple and an orange.

Recall that *huòzhe* standard disjunction in object position can generally lead to scope ambiguities, including with respect to quantificational subjects, as we saw with example (20a) above. As discussed there, such scope ambiguities reflect different adjunction positions for $\exists_{reset}$, for instance to TP or VP, as schematized in (34) below:

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[14] Li and Law (2016) also present evidence of focus intervention effects affecting what I will analyze below as interpretation by $\exists_{pass}$. See discussion in section 4.2 below.

(34) ($^{\checkmark}\exists_{\text{reset}}$) [$_{\text{TP}}$ everyone [λx ... [($^{\checkmark}\exists_{\text{reset}}$) [$_{\text{VP}}$ x ate [$_{\text{JP}}$ sushi *huòzhe*$_{\text{J}}$ pasta]]]]]   for (20a)

High $\exists_{\text{reset}} \Rightarrow$ or > everyone; low $\exists_{\text{reset}} \Rightarrow$ everyone > or

Given the general availability of $\exists_{\text{reset}}$ in these two positions as in (34), the unavailability of the wide scope disjunction reading in (33) deserves an explanation. We can understand this too as a focus intervention effect, following discussion in Li and Law 2016: 225–226. The JP projects alternatives which will compose pointwise with higher material and must be interpreted by the corresponding $\exists_{\text{reset}}$ for the intended interpretation. If the focus-sensitive operator 'only' intervenes, this causes an intervention effect of the Beck and Kim sort, and therefore only the low adjunction of $\exists_{\text{reset}}$ is available here.

(35) (*$\exists_{\text{reset}}$) [$_{\text{TP}}$ only [John]$_{\text{F}}$ [λx ... [($^{\checkmark}\exists_{\text{reset}}$) [$_{\text{VP}}$ x ate [$_{\text{JP}}$ apple *huòzhe*$_{\text{J}}$ orange]]]]]   for (33)

Finally, I note that not all instances of disjunction within the scope of a focus-sensitive operator are ungrammatical. Specifically, it is a focus particle associating with a separate focus — in these examples here, the subject — which causes intervention, but a focus particle associating *with* a *wh*-phrase or an interrogative disjunction does not block their intended question interpretations, as in (36a,b) below. Similarly, focus association with the *huòzhe* standard disjunction in (36c) below allows for the disjunction to scope over the 'only.'

(36) **Focus association *with* the *wh* or disjunction does not trigger intervention:**

     a.   Tā **zhǐ** xǐhuān *shéi*?   (Aoun and Li, 1993: 207)

            3sg only like   who

            $\approx$ 'Who x is such that he/she only likes x?'

     b.   Lǐ Bái **zhǐ** hē-le   [$_{\text{JP}}$ kāfēi *háishi* hóngchǎ]?   (Li and Law, 2016: 230)

            Li Bai only drink-PFV   coffee IDISJ tea

            $\approx$ 'Is it x tea or coffee such that Li Bai drank only x?'

     c.   Yuēhàn **zhǐ** chī-le   [$_{\text{JP}}$ píngguǒ *huòzhe* lí   ].   (based on Li and Law, 2016: 227)

            John   only eat-PFV   apple   SDISJ   pear

            'John only ate an apple or a pear.' (only > or)

            'John only ate an apple or John only ate a pear.' (or > only)

Explaining this possibility of focus association with alternative sources is beyond the scope of this paper. For my main line of argumentation here, it suffices to observe that alternative question formation with *háishi* interrogative disjunction as well as the scope-taking possibilities of *huòzhe* standard disjunction are

both subject to focus intervention effects, in a manner that parallels the occurrence of focus intervention effects in *wh*-questions.

3.3 Summary

In this section, I discussed potential restrictions on the interpretation of the two disjunctors. We have seen that alternative question formation with *háishi* interrogative disjunction as well as the scope-taking of *huòzhe* standard disjunction are insensitive to syntactic islands (§3.1), which affect overt and covert movement (J. Huang, 1982), but are sensitive to focus intervention effects (§3.2). The island-insensitivity facts specifically argue against prior proposals that involve the covert movement of *háishi* in alternative questions (as suggested in J. Huang 1982: 276) or the covert movement of *huòzhe* disjunctions for their scope-taking (as suggested in Erlewine 2014: 223 note 5). The observed restrictions on their interpretation are instead what is predicted by my account, where both types of disjunctions project Roothian alternatives in a manner that leaves them susceptible to so-called focus intervention effects as in Beck 2006 and Beck and Kim 2006.

Throughout this section, we have seen that the two disjunctors precisely parallel one another. This in turn supports my proposal here, that both disjunctors share a common core, J, taking disjuncts of variable syntactic size and projecting their these disjuncts as alternatives.[15] The only difference between them is the choice of corresponding operator that quantifies over their alternatives: in the simple cases discussed so far, Q for *háishi* interrogative disjunction, yielding alternative question meanings, and $\exists_{\text{reset}}$ for *huòzhe* standard disjunction, yielding a boolean disjunction meaning. Having established this deep uniformity between the two disjunctors, I now turn to environments that complicate this one-to-one correlation, which will further inform our understanding of the nature of this link between disjunction form and their corresponding operators.

4 Non-interrogative uses of *háishi*

In this paper, I have adopted the terms "interrogative disjunction" versus "standard disjunction" from Haspelmath (2007) and Mauri (2008) to describe the difference between the Mandarin disjunctors *háishi* and *huòzhe*. Indeed, in all examples seen thus far (excepting (2) in the introduction), the use of *háishi* leads obligatorily to an alternative question interpretation, whereas *huòzhe* leads to the formation of a disjunctive proposition. However, as previewed in the introduction, there are certain environments where

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[15] I refer readers to Appendix A for syntactic arguments that *háishi* interrogative disjunction takes disjuncts of variable size, contrary to the proposals in J. Huang et al. 2009 and R. Huang 2009, 2010a,b.

the use of *háishi* does *not* give rise to an alternative question. These non-interrogative uses of *háishi*, and their connection to non-interrogative uses of *wh*-words, will be the subject of this section.

Non-interrogative uses of *háishi* can be broadly classified into unconditional and related universal uses, as exemplified in (37) below, and existential uses, one type of which is exemplified in (38). Notably, there is substantial variation between speakers in the availability of the existential uses of *háishi* as in (38) below, repeated from (2b) in the introduction.

(37) **Universal *háishi* via unconditionals:** (Lü, 1980: 173)

Wúlùn shàngbān *háishi* xiūxí, tā dōu zài zhuómó xīn-de shèjì fāng'àn.
no.matter at.work IDISJ rest 3sg DOU PROG polish new-DE design plan
'Both when at work and resting, he/she is always crafting new design plans.'

(38) **Existential *háishi* under modals, subject to variation:** =(2b)   (based on Lin, 2008: 75, 118)

%Tā dàgài/kěnéng xǐhuān [_JP Zhāng Sān *háishi* Lǐ Sì].
3sg probably/might like   Zhang San IDISJ   Li Si
'S/he probably/might like(s) Zhang San or Li Si.'

Based on patterns of judgments reported in prior literature as well as that of speakers that I have consulted, there appear to be broadly two categories of judgments, which I will refer to as Type A and Type B here. Type A speakers are more restrictive, allowing non-interrogative *háishi* only in the unconditional and related universal uses such as in (37). Type B speakers allow such universal uses as well as existential uses such as in (38). As Lin Hsin-yin (2008) observes, the environments and interpretations for non-interrogative *háishi* for Type B speakers line up with those of non-interrogative uses of *wh*-words in the language, which includes both universal and existential uses (see e.g. J.-W. Lin, 1996, 1998b).[16]

I will analyze this pattern of non-interrogative interpretations and speaker variation as follows. First, I observe that non-interrogative uses of *háishi* for Type A speakers are essentially embedded question environments, building on the treatment of unconditionals as embedding questions (Cheng and Huang, 1996; Lin, 1996), and I extend this to related constructions involving the quantificational particle *dōu*. I therefore propose that *háishi* bears a [uQ] feature for Type A speakers, requiring its association with

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[16] Ray Huang, in personal correspondence to Bhadra 2017 (p. 171 note 2), conjectures that what I describe as Type B behavior here is associated with Taiwan Mandarin, a possibility that two of my anonymous reviewers raise for consideration as well. Indeed, the authors who have reported Type B pattern judgments in prior literature are Lin Hsin-yin (2008), Hsieh Miao-Ling (2004), Ray Huang (2010a), and Edwin Tsai (2015a), who are all from Taiwan. However, some Taiwanese speakers that I and a reviewer have consulted also appear to command more restrictive, Type A grammars. I will leave the fuller investigation of the demographic differences between these two populations for future work. I thank two anonymous reviewers for pushing me to better describe the attested variation here.

Q. I offer a concrete semantics for unconditionals and related *dōu* constructions in sections 4.1. Then, I propose that *háishi* does *not* bear [uQ] for Type B speakers; see (39) below.

As previewed in section 2 above, the result of *háishi* disjunction is a semantic object akin to that of a *wh*-phrase. On top of this, with the absence of a [uQ] specification — just like *wh*-phrases, which lack [uQ] for all speakers — we predict *háishi* for Type B speakers to have non-interrogative uses in the same range of environments that *wh*-phrases do. I discuss these environments and their compositional interpretation in section 4.2. Finally, in section 4.3, I return to the discussion of how the attested patterns of inter-speaker/dialectal and constructional variation are best understood.

(39)   **A featural difference between Type A and Type B speakers:**

    a.   <u>Type A:</u>   *háishi* = [J, uQ];   *huòzhe* = [J, u∃]

    b.   <u>Type B:</u>   *háishi* = [J];   *huòzhe* = [J, u∃]

4.1   *Háishi* in unconditionals and related *dōu* constructions

I begin by describing the uses of *háishi* disjunctions in so-called unconditionals, available to all speakers (Type A and B). The term "unconditional" refers to constructions that express that a particular consequent will hold across a set of possible circumstances (Zaefferer, 1991). Unconditionals may involve a *wh*-phrase or a disjunction, as exemplified by the English in (40).

(40)   **English unconditionals:**

    a.   No matter which route we take, we'll get to the beach eventually.   (Rawlins, 2013: 113)

    b.   Whether we take route A or route B, we'll get to the beach eventually.

Unconditionals in Mandarin may include a *wh*-phrase or an A-not-A verb form, as in (41). As indicated here, these unconditional adjuncts may be introduced by an expression such as *wúlùn* or *bùguǎn*, which all literally echo the English *no matter*. Although *wh*-phrases in Mandarin have a range of non-interrogative uses (discussed further in the following section), the A-not-A verb form is strongly associated with the formation of polar questions, leading Cheng and Huang (1996: 147–149) and Lin (1996: 76–77) to describe Mandarin unconditionals as involving question embeddings.

(41) **Mandarin unconditionals:** (based on Lin, 1996: 76–77)

    a. [_{uncond} (Wúlùn/bùguǎn) nǐ yāoqǐng shéi], wǒ dōu huānyíng tā.

           no.matter   2sg invite who,   1sg DOU welcome 3sg

      'No matter who you invite, I will welcome him/her.'

    b. [_{uncond} (Wúlùn/bùguǎn) nǐ qù-bú-qù   ], wǒ dōu yào qù.

           no.matter   2sg go-NEG-go 1sg DOU want go

      'No matter whether you go or not, I want to go.'

Against this backdrop, it is unsurprising that Mandarin unconditionals can involve the interrogative disjunction *háishi*, as in (42) below. The possibility of using the standard disjunction *huòzhe* in (42), for which I reproduce the question mark judgment from Chen 2022, is more surprising; I will return to this issue later in this section.

(42) **Mandarin unconditional with *háishi*:** (Chen, 2022: 98)

[_{uncond} Bùguǎn   zuò [_{JP} gāotiě   { ✓*háishi* / ?*huòzhe* } fēijī   ]],

      no.matter sit   high.speed.rail IDISJ / SDISJ   airplane

  Lǐ Sì dōu huì mǎi tóu-děng-cāng.

  Li Si DOU will buy first-class-cabin

    'No matter whether traveling by high speed rail or airplane, Li Si will buy a first-class ticket.'

Here I will adopt a version of the semantics for unconditionals from Rawlins 2008a,b, 2013, which was developed for English unconditionals that are also analyzed as embedding questions. In brief, Rawlins proposes that unconditionals semantically serve as conditional clauses in the Lewis 1975/Kratzer 1981, 1986/Heim 1982 sense, restricting the domain of a modal in the consequent clause. They are, at the same time, a question which thereby denotes a set of propositions. Each proposition in the question composes pointwise with the consequent, restricting its modal; Rawlins then posits an unpronounced operator that universally quantifies over all of these resulting conditionals, in effect requiring in the case of (42) both that (i) if he takes high speed rail, Li Si travels in first class and (ii) if he flies, Li Si travels in first class.

My formal presentation differs slightly from Rawlins' due to my use of a two-dimensional Alternative Semantics, where he uses a one-dimensional Hamblin semantics, and to better reflect the form of Mandarin unconditionals. Specifically, I propose that *dōu* in unconditionals serves the role of taking the antecedent with a question denotation, i.e. a set of propositions P, and requiring that each $p \in P$ binding

the modal restrictor makes the prejacent true. This treatment of *dōu* most closely resembles the proposal in Zhao 2019a,b (see "*dou$_Q$*" there), and also echoes earlier treatments of *dōu* as a distributivity operator (Lin, 1996, 1998a). I however do not intend for it to extend to other uses of *dōu*, especially so-called scalar uses.[17]

I assume an LF for example (42) as in (43) below, illustrating the necessary variables and binders in the syntax. This follows the presentation in Rawlins 2008a,b, 2013 and elsewhere where a λ-binder is inserted to link the conditional with a restriction on the modal base; in my proposal here, I simply split this binding into two steps, mediated by *dōu*, with the semantics in (44). The proposition p restricts the modal base of the modal, in this case *huì* 'will,' a variety of epistemic necessity modal (see e.g. Wu and Kuo, 2010; Tsai, 2015b; Wu, 2020).

(43)
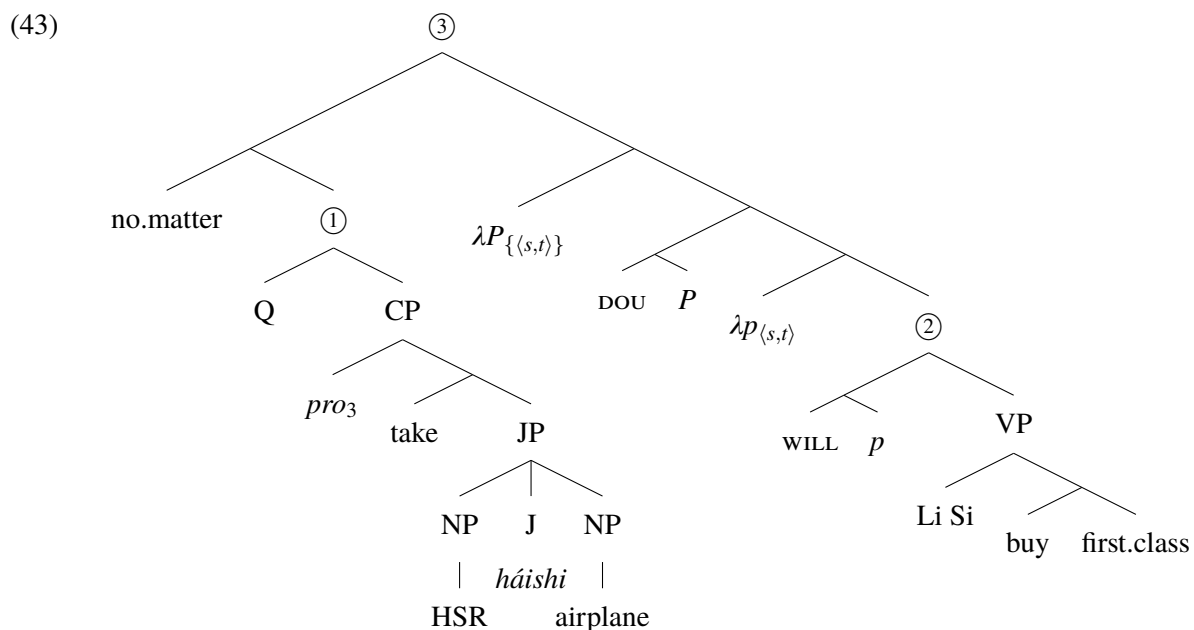
(44) $[\![\text{DOU}]\!] = \lambda P_{\{\sigma\}} . \lambda Q_{\langle \sigma, t \rangle} . \forall p \in P[Q(q)]$

The 'no matter' expression itself (here, *bùguǎn*) does not contribute a semantics, but takes an interrogative CP complement following Cheng and Huang 1996 and Lin 1996. The unconditional clause (①) includes *háishi* and takes Q at its edge, just as I proposed for alternative questions in section 2.1 above. The result is the question denotation as in (45a). I give the denotation for the node labeled ② in (45b) below. The full result for ③ is as in (45c), utilizing the interpretation for DOU in (44) with $\sigma = \langle s, t \rangle$. Note that for all three nodes in (45), the alternative set denotation is the singleton set of the ordinary value. For the intended interpretation, I assume the context resolves $g(3) = $ Li Si.

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[17] See for example discussion of scalar *dōu* in Xiang M. 2008, Liao 2011, Liu 2017a,b, 2019, and Xiang Y. 2020. Notably, none of these works attempt to substantially unify the various uses of *dōu* discussed there with the use of *dōu* in unconditionals.

(45) a. $[\![①]\!]^o = \{^\wedge\mathbf{HSR}(g(3)),^\wedge\,\mathbf{airplane}(g(3))\}$ (type $\{\langle s, t\rangle\}$)

b. $[\![②]\!]^o = 1$ iff $\forall w \in \mathrm{Acc} \cap p[(^\wedge\mathbf{first.class}(\mathrm{Li\ Si}))(w)]$

c. $[\![③]\!]^o = 1$ iff $\forall p \in \left\{ \begin{array}{l} ^\wedge\mathbf{HSR}(g(3)), \\[4pt] ^\wedge\mathbf{airplane}(g(3)) \end{array} \right\} [\forall w \in \mathrm{Acc} \cap p[(^\wedge\mathbf{first.class}(\mathrm{Li\ Si}))(w)]]$

The unconditional structures that I have discussed thus far in this section have all been clauses which contribute to the interpretation of the main clause as a conditional clause does, restricting its modal base. As Lin (1996) and subsequent work has shown, there are also structures of the form "(no matter) XP ... *dōu* ..." where the content of XP serves as an argument of the predicate that follows *dōu*. Here, I will refer to these constructions as *argument unconditionals*.

An important property of argument unconditionals is that they can also be of subclausal size, unlike the adjunct unconditionals above. As an argument for this idea, Lin (1996) observes that nominal argument unconditionals (what he calls "*wúlùn*-NPs") appear to syntactically saturate argument positions. Lin's own examples (p. 89) involve *wh*-phrases, but here I reproduce a parallel example involving *háishi* from He 2011, in (46). The argument unconditional itself saturates the subject position, rather than describing an antecedent for a subject pronoun. This contrasts from unconditionals above; see for instance the pronoun *tā* in (41a) above, whose reference is dynamically determined by the unconditional adjunct description.

(46) **Argument unconditional serves as the subject, rather than anteceding it:** (He, 2011: 81)

[$_{\mathrm{uncond}}$ Wúlùn   Zhāng Sān *háishi* Lǐ Sì] *(tā) dōu hěn cōngmíng.

no.matter Zhang San ɪᴅɪsᴊ Li Si   3sg ᴅᴏᴜ very smart

'Zhang San and Li Si are both smart.'

Despite these facts, Lin (1996) also considers the possibility that argument unconditionals of superficially NP size are underlyingly clausal, with pro-drop and some form of copula drop; for example, for (46) above, underlyingly [*wúlùn pro* ᴄᴏᴘ [ZS ɪᴅɪsᴊ LS]]. However, He (2011) presents a strong argument against the idea of argument unconditionals having a universally clausal underlying structure. Consider the minimal pair in (47) below. The argument unconditionals in (47) serve as the object for the transitive verb *yuànyì* 'hope,' which must take a clausal/propositional object. (Object argument unconditionals must appear in a position above *dōu*, which my account below will explain; see note 18 below.) The fact that (47a) is grammatical with a clausal argument unconditional, but the copula-less version in (47b)

is not, serves to show that nominal argument unconditionals as in (46) and (47b) cannot be uniformly interpreted as reduced (copular) clauses. I conclude with He (2011) that there truly are argument unconditionals of both clausal and nominal size.

(47) **Minimal pair demonstrating clausal vs nominal argument unconditionals:**   (He, 2011: 80)

Context: I heard that someone is going to jump off the building and someone asks me who it is.

a. [$_{\text{uncond}}$ Wúlùn   shì Zhāng Sān *háishi* Lǐ Sì], wǒ dōu bù   yuànyì.

no.matter cop Zhang San idisj   Li Si   1sg dou neg hope

'Both that it is Zhang San and that it is Li Si, I do not hope.'

b. *[$_{\text{uncond}}$ Wúlùn   Zhāng Sān *háishi* Lǐ Sì], wǒ dōu bù   yuànyì.

no.matter Zhang San idisj   Li Si   1sg dou neg hope

Having established this point on the syntactic size of argument unconditionals, I turn to their semantic analysis. Because argument unconditionals can be of nominal size, unlike the unconditional adjunct clauses above, it does not make sense to describe them as embedded questions. Nonetheless, I suggest that they may be interpreted using the same basic ingredients that I involve for unconditional adjunct clauses above. Concretely, I discuss the interpretation of example (46) above, for which I posit the LF in (48):

(48)
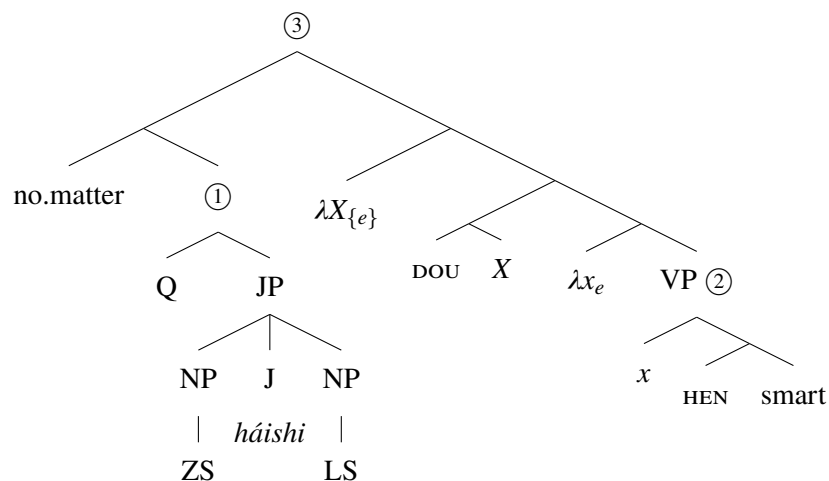
Again I present denotations for key nodes in (49) below. I again assume that the 'no matter' expression (here, *wúlùn*) is semantically vacuous, but here ensures that its complement have an adjoined Q. Although Q generally surfaces at the edge of interrogative CP in my framework — which potentially could be enforced by syntactic feature-checking — I reiterate that Q is *not* itself a functional head in the CP domain, for instance a variety of a Force head; this allows its adjunction to non-CP categories as well,

where necessary. Q here adjoins to JP with disjuncts of NP size. As a result, ① here denotes a set of individuals as its ordinary value (49a). Glossing over the internal composition of the gradable predicate, I assume a denotation for VP (②) as in (49b). DOU in this case takes a set of individuals X that is saturated by the argument unconditional (①) and in turn binds the variable x in the predicate-internal subject position.[18] The resulting interpretation for the entire clause (③) is as in (49c).

(49)   a. $[\![①]\!]^o = \{\text{Zhang San, Li Si}\}$ (type $\{e\}$)

       b. $[\![②]\!]^o = 1$ iff $\mathbf{smart}(x)$

       c. $[\![③]\!]^o = 1$ iff $\forall x \in \{\text{Zhang San, Li Si}\} [\mathbf{smart}(x)]]$

A complication for the view that Mandarin unconditionals — both of the clausal adjunct type and the argument type — embed questions or similar Q-interpreted structures is the fact that disjunction in these structures can also be expressed using the standard disjunctor *huòzhe*. See the *huòzhe* variant of (42) above, which Chen 2022 reports with a single question mark; I also present an argument unconditional attested with the possibility of *huòzhe* in (51) below. However, there appears to be broad individual variation regarding the availability of *huòzhe* standard disjunction in these structures (especially the adjunct unconditionals), as noted by a reviewer and also observed with the native speakers that I have consulted.[19] I tentatively suggest that, for those speakers that allow it, such structures involve the addition of $\exists_{pass}$, with Q lifting the result of $[\exists_{pass} [...JP...]]$ into a set denotation in the ordinary dimension, exceptionally violating Q's requirement in (12c). The insertion of $\exists_{pass}$ checks the [u∃] feature of the standard disjunction *huòzhe*, while still passing up its individual alternatives, resulting in the same interpretation as in (45) and (49) above. See also Lohiniva 2019 for a similar compositional account for Finnish unconditionals involving the standard disjunctor *tai*, rather than the interrogative disjunctor *vai*, using an equivalent of what I call $\exists_{pass}$ here.

Finally, Cheng and Huang (1996) and Lin (1996) note that the 'no matter' expression such as *wúlùn* or *bùguǎn* is optional in Mandarin unconditionals and propose to treat such examples equivalently, with a covert counterpart of 'no matter.' Both disjunctors are again attested as possible, as with the adjunct unconditional in (50) and the argument unconditional in (51) below.

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[18] To satisfy the thematic requirements of the predicate, as well as the normal requirements of the language's clausal syntax, we may like to think of these two variable-binding dependencies ($\lambda X ... X, \lambda x ... x$) as the result of subject movement, possibly in two steps. Syntactically, the argument unconditional has the external distribution of a NP, and so occupies the high subject position, Spec,TP, in (46/48).

     On this account, the need to bind the domain argument of DOU (here, X) from above explains the fact that argument unconditionals that correspond to postverbal arguments must necessarily precede *dōu*.

[19] I note that this variation in the (un)availability of *huòzhe* in unconditionals does not line up with the Type A / Type B distinction in judgments that I describe later in this section.

(50) **Adjunct unconditional without 'no matter' expression:**[20]   (Ito, 2014: 129)

Yī-tái căidiàn, [_{uncond} [_{JP} jiă măi { ✓*háishi* / ✓*huòzhe* } yĭ mài]], dōu shì yī-zhŏng jiàgé.

one-CL color.tv   A buy   IDISJ / SDISJ   B sell   DOU COP one-CL   price

'A color television, whether A buys it or B sells it, is the same price.'

(51) **Argument unconditional without 'no matter' expression:** =(2a)   (Huang et al., 2009: 242)

[_{uncond} [_{JP} Júzi   { ✓*háishi* / ✓*huòzhe* } píngguŏ]] dōu xíng.

orange   IDISJ   SDISJ   apple   DOU okay

'Oranges and apples are both ok.'

4.2 Existential *háishi* patterning with existential *wh* (Type B speakers)

I now turn to non-interrogative uses of *háishi* with an existential interpretation. As noted above, these uses are available only for a subset of speakers, who I call Type B speakers. It is importantly not the case that Type B speakers treat all uses of *háishi* as ambiguous between interrogative (alternative-question-generating) and non-interrogative (especially existential). In all of the basic examples in sections 1–3 above (excepting the non-interrogative examples (2) in the introduction), the use of *háishi* versus *huòzhe* still correspond one-to-one to an alternative question interpretation and a boolean disjunction interpretation for Type B speakers. Instead, it is in a particular set of environments that *háishi* has non-interrogative, existential uses.

So as to avoid any risk of potential misunderstanding, I will continue to report these judgements that vary between Type A and Type B speakers with a % judgment mark here below. The goal of this section will be to describe and analyze the behavior of speakers who do allow these uses; that is, those who judge the % examples in this section as fully acceptable. My description in this section draws substantially from previous work by native speaker linguists who report judgments of the Type B variety as reflecting their own grammars and that of other speakers they consulted. The most detailed of these studies is Lin Hsin-yin's 2008 master's thesis; much of this almost 200 page work is dedicated to the description of such environments. The striking generalization that she presents is that existential *háishi* is available for these speakers in the same environments that license existential uses of *wh*-phrases in Mandarin. I present some examples here to highlight these parallels.

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[20] The availability of *háishi* in an unconditional adjunct without 'no matter' is unexpected according to Chen 2022. It is thus worth noting that example (50) is based on a naturally occurring example from the PKU CCL corpus. Ito (2014) reports that the sentence was judged as grammatical with both *háishi* and *huòzhe* disjunctors for all four speakers that she consulted, who were all from mainland China (Satomi Ito, p.c.).

(52) **Existential *háishi* (Type B) and *wh* under negation:**

a. %Tā méiyǒu mǎi [JP píngguǒ *háishi* lízi].

1sg NEG.PFV buy apple IDISJ pear

'I didn't buy apples or pears.' (Lin H.-Y., 2008: 1)

b. Tā méiyǒu mǎi *shénme*.

3sg NEG.PFV buy what

'He/she didn't buy anything.' (Cheng, 1984: 102)

(53) **Existential *háishi* (Type B) and *wh* in conditionals:**

a. %Rúguǒ [JP Lǎo Wáng *háishi* Lǎo Lǐ] lái dehuà, qǐng tōngzhī wǒ.

if old-Wang IDISJ old-Li come COND please notify 1sg

'If Wang or Li comes, please notify me.' (Lin H.-Y., 2008: 141)

b. Rúguǒ *shénme rén* xǐhuān tā, jiù gēn wǒ jiǎng.

if what person like 3sg then with 1sg speak

'If someone likes him/her, then tell me.' (Li, 1992: 136)

(54) **Existential *háishi* (Type B) and *wh* under epistemic modals:**

a. %Tā yīdìng jiàn-guò [JP Zhāng Sān *háishi* Lǐ Sì].

3sg must see-ASP Zhang San IDISJ Li Si

'He/she must have seen Zhang San or Li Si.' (Lin H.-Y., 2008: 80)

b. Tā yīdìng shì bèi *shénme shì* gěi dāngē le.

3sg must FOC PASS what thing make delay LE

'He/she must have been delayed by something.' (Lin J.-W., 1998b: 223)

For the existential uses of *háishi* in the (a) examples of (52–54) above, I reproduce examples from Lin Hsin-yin 2008, but structurally parallel examples are reported as grammatical with the existential use of *háishi* by Hsieh (2004: 89), R. Huang (2010a: 130–131), and Tsai (2015a: 49–50).[21] These works corroborate each other and attest to the robust existence of a population of speakers for whom *háishi* can be used existentially in certain environments such as in the (a) examples here in (52–54) above.[22] I

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[21] These works include only minimal notes regarding dialectal or speaker variation. Hsieh (2004) acknowledges that "One reviewer pointed out that [equivalent of (52a)] is not quite acceptable" (p. 89 note 22) and Huang (2010b) notes that the equivalent of (53a) is "is accepted by the majority of my informants who speak Taiwan Mandarin." As noted above (note 16), these scholars including Lin Hsin-yin are all from Taiwan, but at present, I cannot confidently claim that Type B grammars are clearly associated with or limited to Taiwanese Mandarin speakers.

note as well that all speakers allow the use of the *huòzhe* standard disjunction in the (a) examples for the intended declarative interpretations, which is also predicted on my account, as I discuss below.

Here for concreteness, I adopt the approach to the distribution of existential *wh*-phrases in Liu and Yang 2021 and demonstrate how it would also extend to derive the distribution of existential, non-interrogative *háishi* for Type B speakers. The proposal in Liu and Yang 2021 (also sketched briefly in Liu 2019) builds on much recent work on the analysis of various types of indefinites as in Chierchia 2013 and subsequent work, where these expressions introduce alternatives which must be interpreted by an appropriate covert operator that then has the effect of restricting its distribution. Specifically, Liu and Yang (2021) propose to treat Mandarin *wh*-phrases as existential quantifiers that activate alternatives that correspond to individual atoms in the domain of the *wh*-phrase (in their terms, "singleton domain alternatives"), which must be interpreted by the exhaustification operator O.

I recast Liu and Yang's (2021) assumptions in the following way, to make them compatible with my overall proposal. First, as already introduced above in section 2.1, I follow Ramchand 1997, Beck 2006, Kotek 2019 and others in treating *wh*-phrases as projecting the set of individuals in their domain as their alternative set (just as Liu and Yang require) but with no ordinary defined value; see (55). I instead propose that $\exists_{pass}$ can be optionally adjoined to the clausal spine — freely, without a featural trigger — to introduce the disjunctive ordinary value. (I discuss the structural position of $\exists_{pass}$ below.) Second, I give a syncategorematic entry for O to make explicit that O uses the Roothian alternative set denotation of its sister for its interpretation. O of α requires that its prejacent $[\![\alpha]\!]^o$ be true and that all non-weaker alternatives of the prejacent be false. (56b) specifies that O is resetting.

(55) a. $[\![\text{who}]\!]^o$ undefined   b. $[\![\text{who}]\!]^{alt} = \{x : x \text{ animate}\} = \{\text{ZS, LS, WW, ...}\}$ =(14)

(56) a. $[\![[O\ \alpha]]\!]^o = [\![\alpha]\!]^o \wedge \forall q \in [\![\alpha]\!]^{alt} [([\![\alpha]\!]^o \not\Rightarrow q) \rightarrow \neg q]$ b. $[\![[O\ \alpha]]\!]^{alt} = \{[\![[O\ \alpha]]\!]^o\}$

To be clear, I propose the free introduction of $\exists_{pass}$ and O for all Mandarin Chinese speakers, explaining the general availability of non-interrogative, existential uses of *wh*-phrases for all speakers. I will highlight the point where I predict the behaviors of Type A and Type B speakers to diverge below.

I first illustrate the case of a basic *wh*-containing clause, without any of the licensing environments for an existential use such as those surveyed above, and discuss what interpretations it may support. As discussed by Cheng 1991, Li 1992, Lin Jo-wang (1998b) and others, (57) may be used as a *wh*-in-situ question, but has no declarative use. Based on the denotation for *shéi* 'who' in (55), the denotation for

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[22] In addition to the environments in (52–54) above, Lin Hsin-yin (2008) reports that existential *háishi* is grammatical for Type B speakers in the following environments, which all license existential *wh*-phrases: in *ma* and A-not-A polar questions (pp. 63–65), under negative adverbs (p. 65–68, 87), under epistemic possibility modals and 'seemingly' (pp. 74–76, 80), under non-factive embeddings such as 'think' and 'hope' (pp. 76–78), and with sentence-final *le* (p. 88).

the VP in (57) with the subject interpreted in its predicate-internal position is as in (58). Setting aside the contribution of tense and aspect, the denotation for VP is equivalent to that of TP in this simple case.

(57) [$_{TP}$ Zhāng Sān xǐhuān *shéi*]

   Zhang San like who

  i. * 'Zhang San likes someone.'

  ii. ✓'Who does Zhang San like?'

(58) a. $\llbracket \text{VP} \rrbracket^{\text{o}}$ undefined b. $\llbracket \text{VP} \rrbracket^{\text{alt}} = \{^{\wedge}\textbf{like}(\text{ZS}, \text{ZS}),\ ^{\wedge}\textbf{like}(\text{ZS}, \text{LS}),\ ^{\wedge}\textbf{like}(\text{ZS}, \text{WW}),\ ...\}$

What interpretations does our framework predict (57) to have? First, we may adjoin the Q operator (12) to the clause edge, resulting in a grammatical *wh*-question (59a), deriving the attested reading. Second, we might imagine adjoining the freely available $\exists_{\text{pass}}$ to the VP. The addition of $\exists_{\text{pass}}$ now gives us a defined ordinary value in (59b), but this proposition is not included within the set of alternatives, so the structure violates the principle of Interpretability (3), as I also previewed in (18) above. Finally, we consider adjoining O to the structure with $\exists_{\text{pass}}$ in (59c).[23] O has the "resetting" property (56b), making the result now satisfy Interpretability: the ordinary value will be a member of its alternative set. However, the resulting meaning will be inherently contradictory: because O requires the negation of all non-weaker alternatives of the prejacent, the result requires both that Zhang San like someone and that each alternative of the form "Zhang San likes *x*" for animate *x* be false. This is the logic by which Liu and Yang (2021) rule out existential non-interrogative uses of *wh*-phrases in simple clauses such as (57).

(59) **Possible LFs building on (57):**

  a. ✓[Q [... [$_{VP}$ Zhang San like *who*]]]   ⇒ grammatical *wh*-question (57ii)

  b. *[$\exists_{\text{pass}}$ [$_{VP}$ Zhang San like *who*]]   ⇒ violates Interpretability (3)

    i. $\llbracket [\exists_{\text{pass}}\ \text{VP}] \rrbracket^{\text{o}} = \exists x\ .\ x$ animate $\wedge\ \textbf{like}(\text{ZS}, x)$

    ii. $\llbracket [\exists_{\text{pass}}\ \text{VP}] \rrbracket^{\text{alt}} = \llbracket \text{VP} \rrbracket^{\text{alt}} = \{\textbf{like}(\text{ZS}, \text{ZS}),\ \textbf{like}(\text{ZS}, \text{LS}),\ \textbf{like}(\text{ZS}, \text{WW}),\ ...\}$

  c. *[O [$\exists_{\text{pass}}$ [$_{VP}$ Zhang San like *who*]]]   ⇒ systematic contradiction

   $\llbracket [O\ [\exists_{\text{pass}}\ \text{VP}]] \rrbracket^{\text{o}} = \llbracket [\exists_{\text{pass}}\ \text{VP}] \rrbracket^{\text{o}} \wedge \forall q \in \llbracket [\exists_{\text{pass}}\ \text{VP}] \rrbracket^{\text{alt}} [(\llbracket [\exists_{\text{pass}}\ \text{VP}] \rrbracket^{\text{o}} \not\Rightarrow q) \to \neg q]$

    $= (\exists x\ .\ x$ animate $\wedge\ \textbf{like}(\text{ZS}, x)) \wedge$

     $\neg\textbf{like}(\text{ZS}, \text{ZS}) \wedge \neg\textbf{like}(\text{ZS}, \text{LS}) \wedge \neg\textbf{like}(\text{ZS}, \text{WW}) \wedge\ ...$

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[23] I do not consider adjoining O directly to a *wh*- or J-containing phrase, without first adjoining $\exists_{\text{pass}}$, as the semantics of O relies on its sister having a defined ordinary value; see (56).

I note that this same logic extends to parallel structures with a *háishi* disjunction in place of the *wh*-phrase, for all Mandarin speakers, thereby maintaining the obligatory alternative question interpretation for structures such as, literally, "Zhang San likes [Li Si *háishi* Wang Wu]" discussed in section 2.1 above.

I now turn to the licensing contexts, starting with negation. I first schematically consider the addition of negation to the structures in (59) above. First, we continue to allow for an interpretation using Q, leading to a *wh*-in-situ question with negation, in (60a). What differs now is the grammaticality of the parse with both $\exists_{\text{pass}}$ and O in (60c), with negation intervening. Downward-entailing operators such as negation lead to a reversal in the entailment relationships between the ordinary value and its alternatives in the scope of O: whereas the prejacent was entailed by each of its alternatives in [$\exists_{\text{pass}}$ VP] (59b), the prejacent in [NEG [$\exists_{\text{pass}}$ VP]] now entails each of its alternatives in (60b). As a result, the application of O in (60c) will be vacuous, as there are no non-weaker alternatives to negate, but it does serve to reset the alternative set denotation, resulting in a meaning that is both contingent and satisfying Interpretability. We therefore predict the existential *wh* interpretation, scoping under negation, to be grammatical.

(60) **Possible LFs with the addition of negation:**

    a. $^\checkmark$[Q [... NEG ... [$_{\text{VP}}$ Zhang San like *who*]]] $\Rightarrow$ grammatical *wh*-question

    b.   *[NEG [$\exists_{\text{pass}}$ [$_{\text{VP}}$ Zhang San like *who*]] $\Rightarrow$ violates Interpretability (3)

         i. $[\![\text{[NEG [}\exists_{\text{pass}}\text{ VP]]}]\!]^{\text{o}} = \nexists x \,.\, x \text{ animate} \wedge \textbf{like}(\text{ZS}, x)$

         ii. $[\![\text{[NEG [}\exists_{\text{pass}}\text{ VP]]}]\!]^{\text{alt}} = \{\neg\textbf{like}(\text{ZS}, \text{ZS}),\ \neg\textbf{like}(\text{ZS}, \text{LS}),\ \neg\textbf{like}(\text{ZS}, \text{WW}),\ ...\}$

    c. $^\checkmark$[O [NEG [$\exists_{\text{pass}}$ [$_{\text{VP}}$ Zhang San like *who*]]]] $\Rightarrow$ grammatical existential *wh*

         i. $[\![\text{[}O\text{ [NEG [}\exists_{\text{pass}}\text{ VP]]]}]\!]^{\text{o}} = [\![\text{[NEG [}\exists_{\text{pass}}\text{ VP]]}]\!]^{\text{o}}$ (vacuous)

         ii. $[\![\text{[}O\text{ [NEG [}\exists_{\text{pass}}\text{ VP]]]}]\!]^{\text{alt}} = \{[O\text{ [NEG [}\exists_{\text{pass}}\text{ VP]]]}\}$ (resetting)

The proposal from Liu and Yang 2021 also extends to existential uses of *wh*-phrases under epistemic modals. (61) below presents the results of LFs as in (59) and (60) above, but with a necessity modal, similar to *yīdìng* 'must/certainly' in (54) above. Unlike with negation in (60c) where the result of O was vacuous (although with the side effect of resetting the alternative set, to satisfy Interpretability), the application of O is not vacuous in (61c). According to Liu and Yang (2021), this result accurately models the quality of existential *wh*-phrases in such contexts as so-called epistemic indefinites. I refer interested readers to Liu and Yang 2021 for discussion of additional licensing environments.

(61) **Possible LFs with the addition of necessity modal:**

a. $\checkmark$[Q [... $\square$ ... [$_{VP}$ Zhang San like *who*]]] $\Rightarrow$ grammatical *wh*-question

b. *[$\square$ [$\exists_{pass}$ [$_{VP}$ Zhang San like *who*]] $\Rightarrow$ violates Interpretability (3)

    i. $[\![\square\, [\exists_{pass}\, VP]]\!]^{o} = \square\,(\exists x\,.\, x\text{ animate} \wedge \mathbf{like}(ZS, x))$

    ii. $[\![\square\, [\exists_{pass}\, VP]]\!]^{alt} = \{\square\,\mathbf{like}(ZS, ZS),\, \square\,\mathbf{like}(ZS, LS),\, \square\,\mathbf{like}(ZS, WW),\, ...\}$

c. $\checkmark$[O [$\square$ [$\exists_{pass}$ [$_{VP}$ Zhang San like *who*]]]] $\Rightarrow$ grammatical existential *wh*

$$[\![O\, [\square\, [\exists_{pass}\, VP]]]\!]^{o} = \square\,(\exists x\,.\, x\text{ animate} \wedge \mathbf{like}(ZS, x)) \wedge$$
$$\neg\,\square\,\mathbf{like}(ZS, ZS) \wedge \neg\,\square\,\mathbf{like}(ZS, LS) \wedge \neg\,\square\,\mathbf{like}(ZS, WW) \wedge\, ...$$

As per the discussion of the basic case in (57/59) above, the considerations of the compositional semantics for the LFs in (60) and (61) also extend to variants of these structures with *háishi* disjunctions in place of the *wh*-phrases. That is, based on the considerations of the compositional semantics alone, we predict a *háishi* disjunction in the scope of a downward-entailing operator or a necessity modal to be interpretable both as an alternative question and as a declarative with boolean disjunction scoping under the licensing operator. However, as we have seen, the latter possibility is only available for Type B speakers. As noted above, I propose that the interrogative disjunctor *háishi* bears a [uQ] feature for Type A speakers, requiring the interpretation of its alternatives by a Q operator; this blocks LFs of the form in (60c) and (61c) with *háishi* disjunction as the alternative source. In contrast, Type B speakers do not restrict the operator involved in the evaluation of *háishi*'s alternatives, allowing for these parses.

The possibility of *wh*-phrases (and *háishi* for Type B speakers) leading to both interrogative and non-interrogative interpretations as in (60) and (61) highlights one advantage of my framework here over the original presentation based on the theory of Chierchia 2013. Although not discussed in detail by Liu and Yang (2021), in the theory of Chierchia 2013 that they largely follow, alternative sources such as polarity items enforce the presence of an appropriate covert operator via syntactic feature-checking (see e.g. Chierchia, 2013: 168); in the case of Mandarin *wh*-phrases, then, this approach would have to specify a disjunctive checking requirement (e.g. [uQ $\vee$ uO]) or else posit a systematic lexical ambiguity between [uQ] and [uO] variants of *wh*-phrases. In contrast, in the framework I develop here, the work of ensuring that certain items that project alternatives are quantified over by an alternative-sensitive operator — in particular, that O is invoked in (60c/61c), if not building an interrogative with Q as in (60a/61a) — is a consequence of the general and independently motivated principle of Interpretability. Under my account, then, *wh*-phrases simply do not bear any syntactic annotation such as [uQ], for all speakers, allowing for the full set of non-interrogative uses (with the exception of certain *wh*-adjuncts such as *zěnme* 'how,' which lack these non-interrogative uses; see e.g. Lin J.-W. 1998b: 248).

I highlight an additional detail regarding these existential uses of *wh*-phrases and *háishi* under negation. Lin Hsin-yin (2008) reports that the perfective negation *méi(yǒu)* (52a) as well as the negator *búshì* allow for the non-interrogative, existential use of *háishi* for Type B speakers, but the simple negation *bù* does not; see (62a). Notably, this parallels a contrast between *búshi* (and *méi(yǒu)*; see (52)) versus *bù* in the availability of existential *wh*-phrases as well; see (62).[24] Note that the judgment marks in (62) are all for the intended, non-interrogative readings.

(62) **Existential *wh* and *háishi* (Type B) under high vs low negations:**   (Lin, 2008: 51–53)

    a. Tā { %búshì / *bù } xǐhuān [$_{JP}$ Zhāng Sān *háishi* Lǐ Sì].

        3sg   NEG / NEG like   Zhang San IDISJ Li Si

        Intended: 'He/she doesn't like Zhang San nor Li Si.'

    b. Tā { ✓búshì / *bù } tǎoyàn *shéi*.

        3sg   NEG / NEG hate who

        Intended: 'He/she doesn't hate anyone.'

I argue that this difference reflects a restriction on the structural positions where $\exists_{pass}$ can be freely adjoined. The negator *bù* is structurally lower than *méiyǒu* and *búshì* (Huang, 1988b; Yeh, 1992; Hsieh, 1996). I propose that $\exists_{pass}$ cannot be adjoined under *bù*,[25] accounting for this contrast between the negators and their parallel between the licensing of existential *wh*-phrases and, for Type B speakers, *háishi* disjunction. The possibility of accounting for this contrast by restricting the syntactic positions for $\exists_{pass}$ constitutes another advantage of my implementation of Liu and Yang's (2021) theory over the original, where *wh*-phrases are treated as inherently denoting existential quantifiers as their ordinary values.

Beyond this lower bound on the position of $\exists_{pass}$, however, its adjunction position is flexible as long as the end result is meaningful and satisfies Interpretability, as noted above. In particular, in environments where there are multiple potential licensors, I suggest that $\exists_{pass}$ may be adjoined at different heights; this follows the approach described by Li and Law (2016: 221–224) for scope facts described by in Lin 2004. In particular, Li and Law (2016: 222–224) show that the span between the alternative source and the position of the existential operator (here, $\exists_{reset}$) is susceptible to focus intervention effects with

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[24] The degradedness of *bù* as a licensor of existential *wh*-phrases is reflected in some notes in prior work as well. See for instance Li 1992: 150 note 3 and Lin J.-W. 2004: 460 note 8.

[25] This may correspond syntactically to being within the lower phase of the clause or not. See for instance Erlewine 2017 for arguments that *bù* is within the lower phase but *búshì* is outside of it.

    Note that it is not simply the case that *bù* cannot contribute to licensing these existential uses. Lin (2008: 54–56) shows that *bù* can license existential *háishi* in an embedded clause. This too is explained by my account, as $\exists_{pass}$ can then be adjoined within the lower clause.

zhǐyǒu 'only' (see their examples (53) vs (57) and (58) vs (59)) just as *wh*-questions and *háishi* alternative questions and the scope-taking of *huòzhe* disjunction are affected by such intervention effects as well (see §3.2). These intervention effect facts further support my approach here, where the existential force of existential *wh*-phrases and, for Type B speakers, *háishi* disjunction is introduced by an adjoined sentential operator that quantifies over projected Roothian alternatives.

Finally, I note that in all of the constructions discussed in this section, where Type B speakers allow for an existential use of *háishi*, the standard disjunctor *huòzhe* can be used by all speakers to express the same intended reading. This too is predicted by my account. For all speakers, the standard disjunction *huòzhe* bears the feature [u∃] which must be checked by either ∃$_{\text{pass}}$ or ∃$_{\text{reset}}$. The parses discussed in this section involving ∃$_{\text{pass}}$ are also possible with *huòzhe*, checking its [u∃] feature.

4.3   Again on the nature of the difference between *háishi* and *huòzhe*

Let us step back and take stock of the facts regarding the use of the two disjunctors, *háishi* and *huòzhe*. I opened this paper with the classic observation that, in many examples, the choice of disjunctor form between *háishi* and *huòzhe* corresponds one to one with the resulting expression being an alternative question or a disjunctive proposition. In this section, I discussed the various environments where the use of *háishi* does not lead to an alternative question, which at first glance complicate its simple description as an "interrogative disjunction." Instead, I argue that these facts can help us to distinguish two different ways in which a language can implement an "interrogative disjunction."

Speakers broadly fall into two groups: For Type A speakers, apparently non-interrogative uses of *háishi* are limited to environments that may be analyzed as involving a question embedding or similar, whereas for Type B speakers, *háishi* can additionally be used non-interrogatively in the range of environments that allow for non-interrogative uses of *wh*-words in the language. I propose to capture this distinction in terms of the lexical specifications for *háishi* between these two groups of speakers, as in (63) below:

(63)   **A featural difference between Type A and Type B speakers:** =(39)

    a. <u>Type A:</u>   *háishi* = [J, uQ];   *huòzhe* = [J, u∃]

    b. <u>Type B:</u>   *háishi* = [J];   *huòzhe* = [J, u∃]

Type A speakers but not Type B speakers require the alternatives projected by *háishi* to be interpreted by a Q operator. In other words, the nature of *háishi* as an "interrogative disjunction" is enforced syntactically for Type A speakers but merely through its semantics for Type B speakers.

It is well known that Mandarin Chinese has interrogative uses of *wh*-words as well as a range of non-interrogative uses (see e.g. Li, 1992; Lin, 1996, 1998b). To allow for this flexibility, I propose that *wh*-words therefore bear no operator feature such as [uQ] or [u∃] (except for items such as *zěnme* 'how' with more limited use). For Type B speakers, then, *háishi* disjunctions result in expressions that are both syntactically and semantically akin to *wh*-phrases, explaining the parallels in the interrogative and non-interrogative environments for these expressions. Note that the distinction between Type A and Type B speakers is specifically in the environments that allow for the non-interrogative uses of *háishi*, rather than differences in the environments that license non-interrogative *wh*; this supports my approach where the locus of variation is in the lexicalization of the *háishi* disjunctor, rather than in there being any difference between these licensing environments between speakers.

Note that the pattern of behavior of Type B speakers constitutes an argument against a hypothetical alternative account, where there is a single disjunctor morpheme in the lexicon, J, whose realization is determined post-syntactically. Concretely, within a realizational theory of morphology such as Distributed Morphology (see e.g. Harley and Noyer 1999, Bobaljik 2017, and citations there), suppose that J is pronounced *háishi* if its alternatives are interpreted by Q (and perhaps Agreeing with it), and *huòzhe* if mutatis mutandis with an existential operator. Such an approach could accurately capture the nature of the difference between "interrogative disjunction" and "standard disjunction" for Type A speakers, but it cannot be maintained for Type B speakers; for Type B speakers, there are grammatical uses of *háishi* involving interpretation by Q and by an existential operator. It is for this reason that I describe these two forms as corresponding to two different lexical items, with equivalent basic syntax and semantics, but varying in their featural specifications as in (63) above.

I reiterate that the specific compositional analyses presented here — for unconditionals and related universal constructions with *dōu* in section 4.1 and for existential uses for select speakers in section 4.2 — are offered here as proof-of-concept proposals that illustrate how the attested non-interrogative uses of *háishi* disjunction can be modeled on my account. The details for the compositional semantics of each of these environments could be replaced by alternative accounts. What is important for the discussion here, for addressing the attested patterns of judgments, is that there is a core difference between the environments where all speakers allow for non-interrogative *háishi* (in section 4.1) and for those environments which allow for non-interrogative *wh*-words but, for many speakers, *háishi* cannot be interpreted non-interrogatively (in section 4.2). I propose to encode this difference featurally, motivated by the idea that that the former environments involve question embeddings or similarly involve the operator Q, whereas the latter environments do not.

Finally, I note that there exist further points of variation in the ranges of use of the two disjunctors

than what I have discussed here. That is, what I describe here as Type A vs Type B is a broad classification that reflects two groups of relatively internally consistent judgments across constructions, but the precise distribution of non-interrogative *háishi* in an individual speaker's grammar may not neatly accord with one of these descriptions or the other. For example, one *JoS* reviewer reports predominantly Type A judgements, but also that they allow for non-interrogative *háishi* under *hǎoxiàng* 'seem.' *Hǎoxiàng* is known to license non-interrogative, existential uses of *wh*-words (see e.g. Li, 1992: 131 ex. 17c) and can license non-interrogative, existential uses of *háishi* for Type B speakers:

(64) **Existential *háishi*, for Type B speakers and a reviewer:** (Lin H.-Y., 2008: 118)

%Tā hǎoxiàng xǐhuān [JP Zhāng Sān *háishi* Lǐ Sì].

3sg seem like Zhang San IDISJ Li Si

'He/she seems to like either Zhang San or Li Si.'

My overall proposal allows for potential microvariation in the featural specifications both for the disjunctors as well as their non-interrogative licensing environments. After all, learners do not inherit lexical items qua feature matrices from their caregivers; instead, each individual learner induces the relevant features and lexical specifications based on the patterns of constructional cooccurrences in their input (see e.g. Zeijlstra, 2008; Cowper and Hall, 2014; Koeneman and Zeijlstra, 2014; Biberauer and Roberts, 2017; Biberauer, 2019). The two feature specifications that I give in (63) may be thought of as one idealized example for these possible lexical specifications, but one which allows us to correctly capture the patterns of judgments for two broad populations of Mandarin speakers.

5 Conclusion

In this paper I investigated the distributions and interpretations of the two disjunctors in Mandarin Chinese, *háishi* and *huòzhe*. In the basic case, the use of *háishi* necessarily results in an alternative question whereas the use of *huòzhe* results in a disjunctive proposition. Following Haspelmath 2007 and Mauri 2008, this exemplifies an interrogative versus standard disjunctor contrast, and I adopt these terms. However, I have shown here that the distributions of use and interpretations for the two disjunctors is more complicated that this first description suggests.

My account here offers the first compositional semantics for the Mandarin disjunctors that adequately accounts for restrictions on the scope-taking of both *háishi* and *huòzhe*, which I show to be deeply parallel to one another, as well as the environments that allow for non-interrogative uses of the interrogative disjunctor *háishi*. Adopting the two-dimensional Alternative Semantics framework of Rooth 1985, 1992

and subsequent work, I propose that both disjunctors project their disjuncts as a set of alternatives in the Roothian alternative set dimension (following Beck and Kim, 2006), which must then be interpreted by an operator for question formation or existential closure, depending on the use. Along the way, I've argued against prior proposals for the Mandarin disjunctors that posit covert scope-taking movement (e.g. Huang 1982: 276 for *háishi* and Erlewine 2014: p. 223 note 5 for *huòzhe*) or where *háishi* but not *huòzhe* must take disjuncts of clausal size (J. Huang et al. 2009: 250, R. Huang 2009, 2010a,b; see Appendix A).

I argue that the adequate description of the nature of the distinction between the two disjunctors requires reference to both syntactic and semantic tools. First, I claim that the standard disjunction *huòzhe* must always cooccur with a corresponding existential operator, which I enforce through syntactic feature-checking. I then propose that the interrogative disjunctor may or may not syntactically enforce its cooccurrence with a question operator Q, corresponding to the distinct behaviors of two broad categories of speakers. For one group of speakers, the interrogative disjunctor *háishi* is limited to contexts that involve a Q operator, while another group of speakers allow *háishi* to be used non-interrogatively in the same environments that *wh*-phrases do. My analysis for this full set of facts, especially the sensitivity to focus intervention effects and the parallels to non-interrogative *wh*-phrases for Type B speakers, builds on the treatment of *wh*-phrases as projecting Roothian alternatives as in Beck 2006 and Kotek 2019, as well as the general constraint of Interpretability for the two-dimensional Alternative Semantics (3).

Similar lexical distinctions between interrogative and standard disjunction have been noted in a range of languages of the world, of different regions and language families (Haspelmath, 2007; Mauri, 2008). A non-exhaustive list of such languages, where the two disjunctors both at least appear to take disjuncts of variable size, include varieties of Arabic (Winans, 2013, 2019; Bani Younes, 2020), Basque (Goenaga, 2009), Finnish (Vainikka, 1987; Kaiser, 2003), Lithuanian (Ramonienė et al., 2019: 144–145), Malagasy (Paul, 2005: 2), Sinhala (Slade, 2011), Somali (Saeed, 1999), Tiwa (Tibeto-Burman, northeast India; Dawson 2020), and Vietnamese.[26] Despite the recognized existence of such contrasts between disjunctors, especially in some typological literature, theoretical work on the nature of these lexical contrasts have been few.

My investigation into Mandarin Chinese *háishi* versus *huòzhe* here offers an example both of the types of empirical phenomena to consider and the potential analytic options for exactly how such a distinction should be described. Concretely, I advocate for investigations into environments that support the exceptional, non-interrogative use of an "interrogative disjunctor" — and potentially, exceptional circumstances under which the "standard disjunctor" may be used to form an alternative question — as

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[26] There are also languages with interrogative disjunctors that appear to differ from standard disjunctors in that the former must take disjuncts of clausal size, i.e. unlike in Mandarin (Appendix A). See for instance Uegaki 2014, 2018 on Japanese, Erschler 2018 on Digor and Iron Ossetic (East Iranian, central Caucasus), and Gračanin-Yuksek 2016 on Turkish.

particularly informative here. A preliminary look shows, perhaps unsurprisingly, that different languages indeed vary in the ranges of use for their two disjunctors in different environments. Consider for example the Vietnamese and Finnish conditional clauses in (65–66) below. Here, we see that Vietnamese patterns with Mandarin Type B (53a) in allowing a non-interrogative use of the interrogative disjunctor inside the question, whereas Finnish patterns with Mandarin Type A in not allowing such use.[27]

(65)   **Vietnamese conditional clause licenses non-interrogative, existential *hay* ɪᴅɪsᴊ:**

[cond Nếu [JP Minh { ✓*hoặc* / ✓*hay* } Kim] gọi đến] thì bảo là tôi đang họp.

if   Minh   sᴅɪsᴊ / ɪᴅɪsᴊ   Kim   call come   then say that 1sg ᴘʀᴏɢ meeting

'If Minh or Kim calls, say that I'm in a meeting.'   (Anne Nguyen, p.c.)

(66)   **Finnish conditional clause does not license non-interrogative *vai* ɪᴅɪsᴊ:**

Olen   onnellinen, [cond jos [JP Pekka { ✓*tai*   / *vai   } Liina] tulee   ].

be.1sg happy   if   Pekka   sᴅɪsᴊ / ɪᴅɪsᴊ   Liina   comes

'I will be happy if Pekka or Liina comes.'   (Hanna Parviainen, p.c.)

Further theoretical study of such interrogative and standard disjunctor pairs across different languages of the world, informed by the study here, may lead to new insights into the extent and shape of cross-linguistic variation in the use of logical connectives for the expression of alternatives.

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[27] The Finnish interrogative disjunctor *vai* inside a conditional clause can lead to the formation of an alternative question at the level of the containing clause, but this requires the addition of a question particle *-ko*, making the *vai* option in (66) simply ungrammatical.

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Appendix A   Against the clausal disjunct analysis of alternative questions

James Huang, Audrey Li, and Li Yafei (2009: 250–257) and Ray Huang (2009, 2010a,b) both propose that Mandarin alternative questions always involve disjunction of full clauses — described as "full-size, bi-clausal sources" by J. Huang et al. (2009: 250) and of "TP/IP" size by R. Huang (2009) — but that disjuncts can sometimes appear to be subclausal on the surface due to the application of productive pro-drop and ellipsis processes, as well as an operation of so-called Conjunction Reduction.[28] In this Appendix, I argue against these clausal disjunct proposals, in support of my own approach whereby both *háishi* interrogative disjunctions and *huòzhe* standard disjunctions can take disjuncts of variable size.

Concretely, I illustrate how the clausal disjunct approach derives the grammatical example in (67a), repeated from (23b) above without my bracketing. (67b) is a slightly simplified form of the derivation that R. Huang gives for this sentence in R. Huang 2010a: 127.

(67)   **Deriving apparent local disjunction via Conjunction Reduction:** (R. Huang, 2010a: 123, 127)

    a.   Nǐ   xǐhuān Zhāng Sān *háishi* Lǐ Sì xiě   de shū?

         2sg like   Zhang San IDISJ Li Si write DE book

         'Do you like the books that Zhang San wrote or the books that Li Si wrote?'

    b.   [TP Nǐ   xǐhuān Zhāng Sān ~~xiě de shū~~] *háishi* [TP *pro* ~~xǐhuān~~ Lǐ Sì xiě   de shū   ]?

         2sg like   Zhang San write DE book IDISJ   like   Li Si write DE book

As the derivation in (67b) makes clear, general processes such as pro-drop (proposed by R. Huang for the second clause's subject) are insufficient to arrive at the surface word order in (67a). These works therefore adopt the use of Conjunction Reduction (Chomsky, 1957; Ross, 1967; Wang, 1967), a non-constituent deletion process proposed to specifically apply within coordinate structures, that will "delete the identical constituent[s] from the edge of conjuncts in coordinate sentences... forward deletion applies where a coordinate structure shows an identical element on a left branch, whereas backward deletion applies the other way around" (R. Huang, 2010a: 98). Here, this results in the forward deletion of *xǐhuān* at the left edge of the right conjunct and backward deletion of *xiě de shū* at the right edge of the left conjunct.

Maintaining the view that Mandarin alternative questions uniformly involve disjuncts of clausal size thus commits us to the existence of some specialized non-constituent deletion operation such as Conjunction Reduction, the precise nature and properties of which are left unclear, and which has been abandoned in most subsequent work (see e.g. Gazdar 1981, although see also Schein 2017). This approach also faces

an overgeneration problem. As illustrated in (67), Conjunction Reduction as invoked here must be insensitive to syntactic barriers such as clause boundaries or islands, thereby accounting for the apparently island-insensitive nature of *háishi* interrogative disjunctions, as reviewed in section 3.1 above. At the same time, as Erlewine (2014) notes, this structural insensitivity fails to predict the sensitivity to intervention effects or *wh*-island effects, an instance of which is in (69) below. (I discuss *wh*-island effects further in Appendix B.) Concretely, for example, Conjunction Reduction as in (67) predicts no difference between the (a) and (b) examples in (68), repeated from above, and (69), contrary to fact. See also J. Huang 1988a: 686 for additional examples that are challenging for a Conjunction Reduction account.

(68) **Focus intervention effect unexplained by Conjunction Reduction:**   =(31a, 32)

    a. ***Zhǐyǒu** [Zhāng Sān]$_F$ chī-le píngguǒ *háishi* júzi   (ne)?

        only   Zhang San eat-PFV apple   IDISJ orange NE

        Intended: 'Was it an apple or an orange that only Zhang San ate?'

    b. [Zhǐyǒu [Zhāng Sān]$_F$ chī-le píngguǒ (ne)] *háishi* [zhǐyǒu [Zhāng Sān]$_F$ chī-le júzi   (ne)]?

         only   Zhang San eat-PFV apple   NE IDISJ only   Zhang San eat-PFV orange NE

        'Did only Zhang San eat an apple or did only Zhang San eat an orange?'

(69) ***Wh*-island effect unexplained by Conjunction Reduction:**

    a. *Nǐ xiǎng zhīdào [*shéi* xǐhuān Lǐ Sì *háishi* Wáng Wǔ] (ne)?   (Erlewine, 2014: 226)

        2sg want know   who like   Li Si IDISJ Wang Wu NE

        Intended: 'Is it Li Si or Wang Wu that you wonder who likes?'

    b. [Nǐ xiǎng zhīdào [*shéi* xǐhuān Lǐ Sì] (ne)] *háishi* [nǐ   xiǎng zhīdào [*shéi* xǐhuān Wáng Wǔ] (ne)]?

         2sg want know   who like   Li Si NE IDISJ 2sg want know   who like   Wang Wu NE

        'Do you wonder who likes Li Si or do you wonder who likes Wang Wu?'

He (2011) also presents an argument against the Conjunction Reduction view from the behavior of *gè-zì*, which Li (2005: 67) glosses as literally 'each-own' and which roughly means 'respective.' He observes that individuals disjoined by *háishi* can serve as the antecedent for *gè-zì* in (70a) and that this contrasts from the alternative question with two separate clauses in (70b), as each *gè-zì* in this case would have a specific, singular antecedent, leading to ungrammaticality. This contrast is also unexplained if the two questions have the same underlying structure, differing only in the application of Conjunction Reduction.

(70) **Distributive reflexive data unexplained by Conjunction Reduction:** (He, 2011: 89)

    a.   Lǎoshī gàosù-le [$_{JP}$ Zhāng Sān *háishi* Lǐ Sì]$_i$ gè-zì$_i$ de chéngjī?

        teacher tell-PFV   Zhang San IDISJ Li Si   each-own DE grade

        'Did the teacher tell Zhang San or Li Si their respective score?'

    b.   *[$_{JP}$ [Lǎoshī gàosù-le Zhāng Sān$_i$ gè-zì$_i$ de chéngjī] *háishi*

            teacher tell-PFV Zhang San each-own DE grade   IDISJ

        [Lǎoshī gàosù-le Lǐ Sì$_j$ gè-zì$_j$ de chéngjī]]?

         teacher tell-PFV Li Si each-own DE grade

        literally 'Did the teacher tell Zhang San their respective score or did the teacher tell Li Si

        their respective score?'

Finally, I present additional evidence for the variable size of disjuncts in alternative questions from the distribution of sentence-final *ne* in alternative questions. The sentence-final particle *ne* frequently appears on matrix alternative questions, as it also frequently does with matrix *wh*-questions (see e.g. Cheng, 1991). It is unavailable in embedded questions.[29]

What is of particular importance here is that *ne* can appear multiply when full clauses are disjoined. See example (71) below, as well as examples (68b) and (69b) above. In such cases, with two disjuncts of clausal size, the first, second, or both *ne* can be pronounced at once. Syntactically, Constant (2014), Paul (2014), and Pan (2019, 2022) (also in Pan and Paul 2016, 2017) have argued that this sentence-final particle *ne* is a head in the CP domain. This indicates that in all such examples where *ne* can appear multiply, the individual disjuncts are of CP size.

(71) **Two *ne* in alternative question with clausal disjuncts:** (Li et al., 1984: 76)

    [$_{CP}$ Zhāng Sān qù ne] *háishi* [$_{CP}$ Lǐ Sì lái   ne]?

    Zhang San go NE IDISJ   Li Si come NE

    'Will Zhang San go or will Li Si come?'

Such structures are compatible with my semantic proposal, as I treat the semantic operator Q (12) as adjoining at the clause edge, rather than being a particular C head itself. The J head realizing *háishi* disjoins the two CPs, forming the set of these propositions as its alternative semantic value; Q adjoins

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[29] There is also a distinct *ne* that Chao (1968: 805) and others have described as expressing a "continued state" aspectual semantics. See Constant 2011 and 2014: 406–436 for discussion of aspectual *ne* in relation to the *ne* here, with examples demonstrating their distinct semantics, syntactic positions, and embeddability. See also Pan 2019: 19–21 for related discussion of dialectal variation in the use of aspectual *ne*.

above this entire JP, resulting in the intended alternative question meaning. I abstract away from the semantic contribution of *ne* here, but see Constant 2014, Ito 2023, and citations there for various views.

In contrast, as Constant (2014) notes, *ne* cannot appear at the right edge of disjuncts of sub-clausal size. See for example (72), two PPs are disjoined by *háishi*. Only one *ne* can be pronounced in (72), at the end of the entire utterance. This is exactly what is predicted on my account, where *háishi* interrogative disjunction can take disjuncts of variable size, together with the idea that the particle *ne* is in the CP domain.

(72) ***Ne* cannot be added after sub-clausal disjuncts:** (Constant, 2014: 341)

Tā xiǎng [[PP gēn Xiǎo-Wáng] (*ne) *háishi* [PP gēn Xiǎo-Lǐ] (*ne)] jiéhūn (✓ne)?
3sg want with little-Wang NE IDISJ with little-Li NE marry NE
'Does s/he want to marry Wang or Li?' (alternative question)

Constant (2014) however goes on to note that there are also examples such as (73) below, reproduced here without bracketing, which at first glance gives the impression that *ne* may appear at the edge of each disjunct of *háishi*, regardless of their size. I propose that the availability of two *ne* in (73) indicates that, in this case, *háishi* takes two disjuncts of CP size, but that the second disjunct undergoes a form of ellipsis that we might call *stripping* or *bare argument ellipsis* (see e.g. Hankamer and Sag, 1976; Rooth, 1992). I assume a movement-and-deletion derivation for stripping, as illustrated for (73) in (74) below (see also Merchant, 2003; Wurmbrand, 2017).

(73) **Two *ne* in alternative question with apparent sub-clausal disjuncts:** (Constant, 2014: 341)

Tā xiǎng qǔ Xiǎo-Wáng ne *háishi* Xiǎo-Lǐ ne?
3sg want marry little-Wang NE IDISJ little-Li NE
'Does s/he want to marry Wang or Li?' (alternative question)

(74) [[CP Tā xiǎng qǔ Xiǎo-Wáng ne] *háishi* [CP Xiǎo-Lǐ [TP ~~tā xiǎng qǔ~~ *t*] ne]]
3sg want marry little-Wang NE IDISJ little-Li 3sg want marry NE

Finally, I note that this form of stripping must be forwards deletion rather than backwards; in particular, it is not possible to generate forms such as (75):

(75) **Ungrammatical result of backwards stripping:** (Wu, 1992: 81)

    *[[_{CP} Nǐ Δ ne] *háishi* [_{CP} wǒ qù Běijīng ne]]?

        2sg   NE IDISJ   1sg go Beijing NE

    literally ≈ 'You, or will I go to Beijing?'

Note that my stripping account does not generally require the correlate of stripping to be clause-final as it is in (73). Stripping with a clause-medial correlate predicts the availability of apparently discontinuous disjunction. Such examples are indeed possible; see (76), where Δ indicates the ellipsis site in the right disjunct. The availability of *ne* in two positions again supports the underlying presence of two CPs in this case.

(76) **Stripping with a clause-medial correlate:**

    [[_{CP} Tā xiǎng [_{PP} gēn Xiǎo-Wáng] jiéhūn (ne)] *háishi* [_{CP} [_{PP} gēn Xiǎo-Lǐ] Δ (ne)]]?

        3sg want   with little-Wang marry NE IDISJ   with little-Li   NE

    'Does s/he want to marry Wang or Li?' (alternative question)

Although Constant introduces the data in (72) and (73), he does not offer an analysis, concluding that "the syntactic restrictions remain to be explained" (p. 342). My account here offers a natural explanation for such data. In (73), the correlate *Xiǎo-Wáng* of the stripping constituent *Xiǎo-Lǐ* is clause-final, giving the illusion of a possible local disjunction parse, but it is actually the disjunction of two full clauses with stripping.

It is important to note that, although I invoke the possibility of clausal disjuncts with ellipsis in (73–74) here, my proposal differs from that of J. Huang et al. (2009) and R. Huang (2009, 2010a,b) in two ways. First, the form of ellipsis I invoked is the well established and independently necessary form of stripping, which as sketched in (74) above can be derived by constituent (TP) ellipsis. This is contrast to the prior accounts which resort to a non-constituent Conjunction Reduction operation. Second, on my account *háishi* can take full clause disjuncts but can also take disjuncts of sub-clausal size. No clausal disjunction parse is possible in (72), explaining the unavailability of *ne* following its disjuncts, making such examples a strong argument that *háishi* interrogative disjunction may take disjuncts of variable size.

Appendix B   Interactions between disjunctions and *wh*-phrases

In section 3.1, I noted that Erlewine (2014) reports that *háishi* interrogative disjunction cannot scope out of an embedded *wh*-question, i.e. that it is subject to *wh*-island effects. Consider example (77) below.

Note that the embedding *xiǎng zhīdào* must embed a question. Erlewine (2014) only reports the unavailability of reading (a), but it is worth noting that the utterance is also ungrammatical with the intended reading in (b). I also comment below on the unavailability of embedded multiple question parses.

(77)   ***wonder [... wh ... ɪᴅɪsᴊ ...]***   (based on Erlewine, 2014: 234)

    *Zhāng Sān xiǎng zhīdào [*shéi* xǐhuān [ᴊᴘ Lǐ Sì *háishi* Wáng Wǔ]] (ne)?

    Zhang San want know   who like   Li Si ɪᴅɪsᴊ Wang Wu   ɴᴇ

    a. * 'Is it LS or WW *y* that ZS wonders who likes *y*?'   (matrix alt. q, embedded *wh* q.)

    b. * 'Who *x* is it that ZS wonders whether *x* likes LS or WW?'   (matrix *wh* q., emb. alt. q.)

Huang (2020: 234) also corroborates Erlewine's observation, also presenting additional examples of the same form (although see also Dong 2009: 19 for a potential counterexample). Interestingly, however, all of these examples in the literature have the *wh*-phrase preceding the *háishi* interrogative disjunction within the embedded clause. Where the two are reversed, the utterance *does* have a felicitous use as a matrix alternative question, as in (78a).

(78)   ***wonder [... ɪᴅɪsᴊ ... wh ...]***

    Zhāng Sān xiǎng zhīdào [[ᴊᴘ Lǐ Sì *háishi* Wáng Wǔ] xǐhuān *shéi*] (ne)?

    Zhang San want know   Li Si ɪᴅɪsᴊ Wang Wu like   who   ɴᴇ

    a. √ 'Is it LS or WW *y* that ZS wonders who *y* likes?'   (matrix alt. q, embedded *wh* q.)

    b. * 'Who *x* is it that ZS wonders whether LS or WW likes *x*?'   (matrix *wh* q., emb. alt. q.)

Concretely, adopting the distinguished variable approach to alternative computation (Kratzer, 1991; Wold, 1996; Beck, 2016; Howell et al., 2022) which allows for selective binding of alternative sources, the attested reading in (78a) can be computed by the embedded Q specifically associating with *shéi* 'who,' leaving the alternatives introduced by the disjunction for evaluation by matrix Q. See Howell et al. 2022 for arguments that Q is selective in this way, unlike focus-sensitive operators, explaining cross-linguistic asymmetries between insensitivity to *wh*-islands and sensitivity to focus intervention effects. However, this approach leaves the unavailability of the readings in (77a,b) and (78b) surprising. I will leave this puzzle here for future work.

What is of further interest for the subject of this paper is the behavior of *huòzhe* standard disjunction in these same contexts. Specifically, we observe in (79–80) below that the ability of *huòzhe* to scope out of the embedded question, in the (a) readings, appears to parallel the availability of the matrix alternative questions in (77–78) above.

(79) ***wonder* [... *wh* ... SDISJ ...]**

Zhāng Sān xiǎng zhīdào [*shéi* xǐhuān [JP Lǐ Sì *huòzhe* Wáng Wǔ]].

Zhang San want know who like Li Si SDISJ Wang Wu

   a.   * 'For either LS or WW *y*, ZS wonders who likes *y*.'   (wide scope disjunction)

   b.   ✓ 'ZS wonders who likes either one of LS or WW.'   (narrow scope disjunction)

(80) ***wonder* [... SDISJ ... *wh* ...]**

Zhāng Sān xiǎng zhīdào [[JP Lǐ Sì *huòzhe* Wáng Wǔ] xǐhuān *shéi*].

Zhang San want know Li Si SDISJ Wang Wu like who

   a.   ✓ 'For either LS or WW *y*, ZS wonders who *y* likes.'   (wide scope disjunction)

   b.   ✓ 'ZS wonders who either one of LS or WW likes.'   (narrow scope disjunction)

In sum, whatever mechanisms underlie these contrasts, the fact that they apply in parallel to alternative question formation with *háishi* and the scope-taking of *huòzhe* directly supports my account, where both disjunctors share a syntactic and semantic core that projects their disjuncts as alternatives.

Finally, I also note that *háishi* interrogative disjunctions cannot form a multiple question together with a *wh*-phrase, as noted by Yang (2012: 48, 2015: 156), Duan (2015), Ito (2016: 352), Fu (2020: 497), and R. Huang (2020: 234). Accordingly, examples such as (77–78) above also lack embedded multiple question readings. An anonymous reviewer also notes that a sentence with multiple *háishi* interrogative disjunctions likewise cannot be interpreted as a multiple question. (See also Beck and Kim 2006: 187–188 for discussion of the uncertain status of parallel constructions in English.) I will leave the deeper explanation for this apparent inability to form multiple questions involving interrogative disjunction for future work.