

Sentence-Final *Only* and the Interpretation of Focus in Mandarin Chinese¹

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In this paper I document the complex interactions between the Mandarin sentence-final *only* item *éryǐ* and the focus marker *shì*. Following work on Chinese Sentence-Final Particles (SFP), *éryǐ* syntactically is in the CP-domain and thus should scope above TP-level operators such as negation, and this is indeed normally the case. However, the introduction of the focus marker *shì* can force the sentence-final *éryǐ* to take scope below the TP-level negation, creating a problem for the theory of Mandarin SFP.

I propose that *shì* unambiguously marks the semantic scope of Mandarin focus-sensitive operators which involve Association With Focus. I show how this analysis preserves the expected syntactic cartography while computing the correct semantic scope. A compositional syntax/semantics utilizing focus movement is also presented.

0. Introduction

Mandarin Chinese has two *only* words which can introduce a semantics of exclusivity: a preverbal *zhǐ* (只) and a sentence-final *éryǐ* (而已). The three examples in (1), in this context, are truth-conditionally equivalent.

(1) Context: “What did he do yesterday?”; “What does he do on Saturdays?”

- a. 他只 看 電視 而已。
Tā zhǐ kàn diànshì éryǐ
He ZHI watch TV ERYI
‘He only watches/watched TV.’
- b. 他 看 電視 而已。
He watch TV ERYI
- c. 他只 看 電視。
He ZHI watch TV

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Previous work on Mandarin *only* items (Tsai, 2004) has only investigated *zhǐ*. In this paper we will focus on the distributional and semantic characteristics of the sentence-final *éryǐ*, together with the focus-marker *shì* (是). As we will see, the interaction of the two items presents a puzzle that challenges our understanding of scope and Chinese phrase structure. The crux of the puzzle is as follows: following work on Chinese Sentence-Final Particles, *éryǐ* syntactically is in the CP-domain and thus should scope above TP-level operators such as negation, and this is indeed normally the case. However, the introduction of the focus marker *shì* can force the sentence-final *éryǐ* to take scope below the TP-level negation.

To explain this puzzle, I will propose the following: that there is a particular syntactic projection in the Mandarin Chinese clause where focus alternatives are computed, and that *éryǐ* uses the alternatives from that projection in its computation. This projection can be marked overtly by the focus marker *shì*. The scope contrasts observed are then a reflection of the scopal relations between negation and *shì* (or a covert version thereof). *Éryǐ* can then maintain its CP-level position.

This paper is organized as follows: in section 1, I will present the basic distribution and semantic properties of *zhǐ* and *éryǐ*, establishing both as Association With Focus operators. I also present evidence for the sentence-final *éryǐ* being a low C head. In section 2, I introduce the focus marker *shì* and the novel and challenging puzzle which is at the heart of this paper. In section 3, I present my analysis, which highlights *shì*'s crucial contribution in marking precisely where the computation of focus alternatives takes place, and demonstrate how this can explain the puzzling scope facts. In section 4, I give a proof-of-concept compositional semantics using focus movement, and give evidence from contrastive continuations to support this view. I conclude in section 5.

1. Two *only*s in Mandarin Chinese

1.1. *Only* and Association with Focus

An *only* operator requires that its complement include a focused constituent. *Only* then asserts that no alternative to the prejacent is true (Horn, 1969; Rooth, 1985). *Only* items may also have a presuppositional component, which may specify that the stated prejacent or a similar proposition is true. The choice of semantic focus is established via a mechanism dubbed *Association with Focus* (AWF) (Jackendoff, 1972; Rooth, 1985).

A property of AWF is that the focused constituent can be any subconstituent of the complement. In English, for example, prosodic cues are used to indicate which constituent is focused:

- (2) **Two sentences with different truth conditions** (Rooth, 1985)
 - a. Mary only introduced [Bill]_F to Sue.
 - b. Mary only introduced Bill to [Sue]_F.

Consider which constituents are possible foci for the Mandarin *only* items, *zhǐ* and *éryǐ*. We see from the sentences below that the semantic focus of both *only* items must be within the verb phrase, such as the object (3a) or the verb (3b), but not the subject (3c). As different VP-internal constituents can be the focus, modulated by prosodic cues, we can conclude that the mechanism here is indeed AWF. (Here, *zhǐ* and *éryǐ* both being marked as optional is meant to indicate that one, the other, or both of the items are present.)

(3) ***zhǐ* and *éryǐ* associate with focus within the VP:**

- a. 我 (只) 愛 [你]_F (而已)。
 Wǒ zhǐ ài nǐ éryǐ
 I ZHI love you ERYI
 ‘I only love [you]_F... I love no one else.’
- b. 我 (只) 會 [念]_F 漢字 (而已)。
 Wǒ zhǐ huì niàn hànzi éryǐ
 I ZHI can read Chinese characters ERYI
 ‘I only can [read]_F Chinese characters... I cannot write them.’
- c. * [我]_F (只) 愛 你 (而已)。
 Wǒ zhǐ ài nǐ éryǐ
 I ZHI love you ERYI
 Intended: ‘[I]_F love you... no one else loves you.’

It is important to note that *éryǐ* also has another, non-AWF reading where it asserts that the given clause is the only appropriate utterance in the conversation. A brief look at this use of *éryǐ* is included in the appendix.

In the remainder of this paper I will focus on the understudied sentence-final *only* item, *éryǐ*. I begin by investigating its syntactic position.

1.2. The position of sentence-final *éryǐ*

Chinese sentence-final particles (SFP) have traditionally been categorized into three classes whose relative order is fixed: $C_1 \prec C_2 \prec C_3$. Some canonical SFP in each class are presented in the following table from Paul (2010):

| low C (C_1) | force (C_2) | attitude (C_3) |
|--|---|-------------------------------------|
| <i>le</i> currently relevant state | <i>ma</i> interrogative | <i>ou</i> warning |
| <i>láizhe</i> recent past | <i>ba</i> imperative | (<i>y</i>) <i>a</i> astonishment |
| <i>ne</i> ₁ continued state | <i>ne</i> ₂ follow-up question | <i>ne</i> ₃ exaggeration |

An utterance can include at most one item from each class. Paul (2010) thus argues for these three classes to be recast as a split-CP à la Rizzi (1997): [[[TP C_1] C_2] C_3].

This view posits that Chinese CP-level items are head-final, while TP-internal items are head-initial, contra the Final-Over-Final Constraint (Biberauer et al., 2009).

Let us consider *éryǐ* within this context. The linear placement of *éryǐ* clearly puts it in the class of “sentence-final particles”: it must be pronounced at the right edge of a clause. Only the force and attitude particles are allowed—in fact, required—to surface after *éryǐ*:

(4) *éryǐ* < C₂, C₃ (here C₂ *ma*)

- a. 你 只 會 說 [國語]_F 而 已 嗎?
 Nǐ zhǐ huì shuō guóyǔ éryǐ ma
 you ZHI can speak Chinese ERYI Q
 ‘Can you only speak [Chinese]_F?’
- b. *你 只 會 說 [國語]_F 嗎 而 已?
 you ZHI can speak Chinese Q ERYI

Consistent with this fact, other low C heads cannot be pronounced together with *éryǐ*:

(5) *éryǐ* cannot co-occur with C₁ (here ‘Currently Relevant State’ *le*)^{2,3}

Context: “Where is he?” or “Why is he gone today?”

- a. 他 出 去 買 東 西 了
 Tā chū qù mǎi dōngxì le
 he go.out go buy things CRS
 ‘He went out to go shopping.’
- b. *他 出 去 買 東 西 {了 而 已, 而 已 了}
 Tā chū qù mǎi dōngxì {le éryǐ, éryǐ le}
 he go.out go buy things {CRS ERYI, ERYI CRS}
 Intended: ‘It’s just that he went out to go shopping... there’s no other reason.’

We see from the above facts that *éryǐ* is clearly a SFP of the first class. Following Paul (2010), the item must then be a low C head, and we would thus expect it to take scope above the entire TP. In the following section, we will see that this is not always the case.

²Note: perfective *-le* (or “verbal *-le*”), on the other hand, can be pronounced string adjacent to *éryǐ* in cases where there is no intervening material in the VP.

(1) Context: “Why is he hurt?”

他 跌 倒 了 而 已
 tā dīdào le éryǐ
 he fall PRV ERYI

‘He just fell.’

³Soh (2009, pp. 637–641) argues that sentence-final *-le* cannot cooccur with *éryǐ* due to semantic reasons rather than syntactic ones.

2. The effects of *shì*

2.1. *shì*-focus constructions

The word *shì* (是) in Mandarin is normally the copular verb but can also be a “focus marker,” indicating that some or all of its complement is focused (Huang, 1988a; Teng, 1978).

Paul and Whitman (2008) show convincingly that focus-marking *shì* is not a unified phenomenon: different types of constructions with focus-marking *shì* exhibit clearly distinct semantic properties, motivating four distinct focus constructions involving *shì*:

| | mechanism | focused constituent | exclusiveness ⁴ |
|----------------------------------|---------------------------|------------------------------|----------------------------|
| sentence-initial bare <i>shì</i> | cleft | subject | yes |
| sentence-initial bare <i>shì</i> | emphasis | entire sentence | no |
| sentence-medial bare <i>shì</i> | Association With Focus | any constituent within VP | no |
| <i>shì</i> ... <i>de</i> | cleft | subsequent constituent | yes |

Among these various focus constructions, here I will pay particular attention to *shì* in sentence-medial (post-subject, pre-verbal) position. This *shì* is the one identified by Paul and Whitman (2008) as using Association With Focus. We can see the AWF in action below, where sentence-medial bare *shì* simply marks the VP as containing a focused constituent.

(6) Sentence-medial bare *shì* (Paul and Whitman, 2008)

- a. 他不是在北京學 [語言學]_F, 是在北京學 [法文]_F。
 Tā bu shì zài Běijīng xúe yǔyánxúe, shì zài Běijīng xúe fǎwén
 He NEG SHI at Beijing study linguistics, he at Beijing study French
 ‘He didn’t study [linguistics]_F in Beijing, he studied [French]_F in Beijing.’
- b. 他不是在北京 [學]_F 語言學, 是在北京 [教]_F 語言學。
 Tā bu shì zài Běijīng xúe yǔyánxúe, shì zài Běijīng jiào yǔyánxúe
 He NEG SHI at Beijing study linguistics, he at Beijing teach linguistics
 ‘He didn’t [study]_F linguistics in Beijing, he [taught]_F linguistics in Beijing.’

The sentence-medial bare *shì* marks the existence of a focused constituent within the VP. In the next section, we will see *shì*’s crucial role in determining the interpretation of the *only* word *éryǐ*.

⁴Exclusiveness asserts that only the designated focus can satisfy the property. Exclusiveness is a property of clefts but not of Association with Focus proper.

2.2. Negation, *shì*, and the scope of *éryǐ*

Negation in Mandarin Chinese, canonically *bu* (不), surfaces in the pre-verbal field where *zhǐ* is pronounced. Negation may surface on either side of *zhǐ*, with its scope clearly reflecting linear order:

- (7) ZHI < NEG: ONLY > NEG

我 只 不 喜 歡 吃 [肉包]_F (而已)。

wǒ zhǐ bu xǐhuan chī ròubāo éryǐ

I ZHI NEG like eat meat buns ERYI

‘I only don’t like to eat [meat buns]_F... I like to eat all other things.’

- (8) NEG < ZHI: NEG > ONLY

他 不 只 喜 歡 吃 [肉包]_F (而已)。

tā bu zhǐ xǐhuan chī ròubāo éryǐ

He NEG ZHI like eat meat buns ERYI

‘I don’t only like to eat [meat buns]_F... I also like to eat some other things.’

Consider, however, a more interesting case: clauses with negation and *éryǐ*. Based on our identification of *éryǐ* as a low C Sentence-Final Particle, we would predict it to scope over the TP-level negation. This prediction is borne out in the following sentence:

- (9) NEG...éryǐ: ONLY > NEG, *NEG > ONLY

我 不 喝 [茶]_F 而已。

Wǒ bu hē chā éryǐ

I NEG drink tea ERYI

✓ ‘I only don’t drink [tea]_F... I drink everything else.’

* ‘I don’t only drink [tea]_F... I also drink other things.’

However, if we add a focus marker *shì* after the negation in (9), **only the reverse scope reading is available**:

- (10) NEG SHI...éryǐ: *ONLY > NEG, NEG > ONLY

我 不 是 喝 [茶]_F 而已。

Wǒ bù shì hē chā éryǐ

I NEG SHI drink tea ERYI

* ‘I only don’t drink [tea]_F... I drink everything else.’

✓ ‘I don’t only drink [tea]_F... I also drink other things.’

This contrast is the core puzzle that this paper—and any analysis of Mandarin negation and focus markers—must address: by default, *éryǐ* must take scope over negation (9), but the addition of the focus marker *shì* flips *éryǐ*’s scope with respect to negation (10).

3. Analysis

To better understand the contrast presented in (9–10), we must be precise about what negation scoping above or below ONLY really means. Following Tsai (2004), I take Horn’s (1969) analysis of ONLY to apply in Mandarin as well. That is, ONLY computes a set of alternatives and asserts that only the stated prejacent can be true.

$$(11) \quad \text{ONLY} > \text{NEG}: \\ \llbracket (9) \rrbracket = 1 \iff \forall \phi \in \{ \text{I don't drink tea, I don't drink coffee, I don't drink water, ...} \} \\ [\phi \rightarrow (\phi = \text{I don't drink tea})]$$

$$(12) \quad \text{NEG} > \text{ONLY}: \\ \llbracket (10) \rrbracket = 1 \iff \neg (\forall \phi \in \{ \text{I drink tea, I drink coffee, I drink water, ...} \} \\ [\phi \rightarrow (\phi = \text{I drink tea})])$$

What is most important here is what the candidates in this alternative set are and what constituent they are generated from. We note that each of the alternatives under consideration in (9) include negation, while the alternatives in (10) do not. This position of alternative set computation is indicated by Alt below:⁵

$$(13) \quad \text{ONLY} > \text{NEG} (9) \\ \text{我} \text{ } [_{\text{Alt}} \text{不 喝 茶}] \text{而已。} \\ \text{Wǒ} \quad \text{bu} \quad \text{hē} \quad \text{chǎ} \quad \text{éryǐ} \\ \text{I} \quad \text{NEG} \text{ drink tea} \quad \text{ERYI}$$

$$(14) \quad \text{NEG} > \text{ONLY} (10) \\ \text{我 不 是} \text{ } [_{\text{Alt}} \text{喝 茶}] \text{而已。} \\ \text{Wǒ} \text{ bu} \text{ shì} \quad \text{hē} \quad \text{chǎ} \quad \text{éryǐ} \\ \text{I} \quad \text{NEG} \text{ SHI} \quad \text{drink tea} \quad \text{ERYI}$$

I propose the following generalization: *shì* unambiguously marks the position of alternative set computation in Association With Focus interpretation, regardless of the position of the focus operator (e.g. *éryǐ*). The main claim is as follows:

- (15) ***shì* marks the projection where the focus alternatives used by the semantics of *éryǐ* are computed.** Sentences in Mandarin with AWF obligatorily have *shì*, though sometimes an unpronounced version.

This makes *shì* functionally equivalent to Rooth’s (1992) squiggle operator (\sim), which marks the syntactic level at which focus is interpreted. While Rooth (1992) proposed \sim as

⁵Here I abstract away from the scope and position of the subject, as the purpose here is to better understand the relationship between negation and the interpretation of ONLY.

having no phonological realization and being inserted at LF, *shì* may be an overt version of \sim .⁶ The scope contrasts observed in (9–10), then, can be more correctly recast as differing scope relations between negation and the squiggle operator, *shì*. **Despite its higher syntactic position, in practice *éryǐ* inherits its semantic scope from the scope of *shì*.** (A technical implementation that resolves this syntax/semantics mismatch will be presented in section 4.)

Under this view, (9) would be a case where there is a phonologically null *shì* (ϕ_{SHI}) above negation. In fact, it is also possible to pronounce a *shì* before *bu* in (9) with the same scope interpretation:

(16) SHI NEG...*éryǐ*: ONLY > NEG, *NEG > ONLY

我 是 不 喝 [茶]_F 而已。
Wǒ shì bu hē chǎ éryǐ
I SHI NEG drink tea ERYI

✓ ‘I only don’t drink [tea]_F... I drink everything else.’

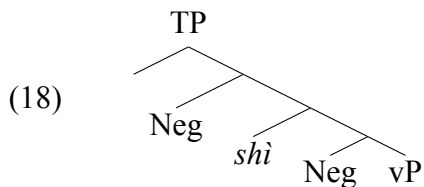
* ‘I don’t only drink [tea]_F... I also drink other things.’

As we have seen now, the negation *bu* can be before or after an overt *shì*. This reflects the fact that Mandarin Chinese simplex sentences have two positions for negation (Schaffar and Chen, 2001), as can be easily observed in sentences such as (17) below.⁷ This gives us the cartography in (18) for the possible positions of negation and *shì*.⁸

(17) 我 不 是 [不 喜 欢 吃]_F 肉 包。
wǒ bu shì bù xǐhuan chī ròubāo

I NEG SHI NEG like eat meat buns

‘I don’t [not like to eat]_F meat buns... I’d just rather have something else.’



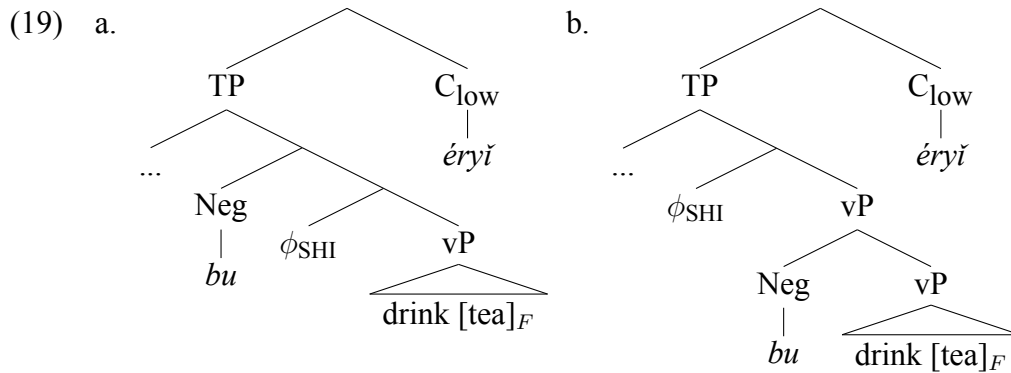
⁶This equivalence cannot be made explicit, however, as Rooth (1992) does not give a compositional semantics for \sim that allows other operators intervening between it and the focus-sensitive operator. For Rooth, \sim in English is always introduced right below the focus-sensitive operator itself. A proof-of-concept compositional semantics for this process that allows intervening operators is presented in section 4.

⁷Note that Paul and Whitman (2008) offer evidence from the position of modals and adverbials that sentence-medial bare *shì* constructions (such as in 17) are monoclausal.

⁸Danny Fox (p.c.) and Irene Heim (p.c.) have asked whether *bu* might be a concord negation with an abstract negation in a higher, CP-level position. There is no evidence for adopting such a view, though, especially as the scope of subject quantifiers and adverbs placed before negation all take scope over negation.

Now let us see how this cartography and the view of the special role of *shì* in AWF interpretation (15) can explain the scope-switching effect in (9–10). First consider (10): *bu shì...éryǐ*. Here the linear order of *bu shì* makes it clear that this negation is the higher one, above *shì*, and crucially does not contribute to the computation of alternatives. As *éryǐ* takes scope where its alternatives are computed, the only available reading gives the attested scope of NEG > ONLY.

Second consider (9): *bu...éryǐ*. Here there are two potential parses since there is no overt *shì*—one where *bu* is a high negation above ϕ_{SHI} (19a) and another where it is a low negation below ϕ_{SHI} (19b):



In (19a), the negation is not included in the alternative set computation, yielding an interpretation with NEG > ONLY. In contrast, the negation in (19b) does contribute to the alternatives, resulting in ONLY > NEG. However, recall that (9) itself is unambiguous: the only attested reading is ONLY > NEG.

A closer look at the negation *bu* helps us resolve this ambiguity. The negation *bu* is a proclitic (Ernst 1995; Huang 1988b), with its phonetic realization conditioned by the following word: *bu* is pronounced with a clear fourth (falling) tone (*bù*) in citation form, but is often pronounced with neutral tone and becomes second (rising) tone (*bú*) when the following syllable is fourth (falling) tone. *Bu* also has a suppletive form, *méi* (没), which is triggered when the following verb is perfective or the verb ‘have’ (*yǒu* 有). *Bu* requires an immediate morphological host to condition its phonetic realization. In (19a), the proclitic *bu*’s closest morphological host is phonologically null, making this parse unavailable. Thus the only available parse for (9) is (19b), with negation below the covert ϕ_{SHI} . This predicts its unambiguous interpretation of ONLY > NEG.

The key here is the role of *shì*. *Shì* marks precisely where the focus alternatives are computed, and thus where *éryǐ* takes its semantic scope. This explains the puzzling scope contrast in (9–10).

Finally, recall that the sentence-medial bare *shì* considered here must surface between the subject and verb (Paul and Whitman, 2008). The requirement that *shì* mark the position where focus alternatives are computed (15)—and thus that the semantic focus of *éryǐ*

be within the complement of *shì*—explains why *éryǐ* cannot associate with subjects, as observed in (3c).

4. A focus movement compositional semantics

In the previous section I proposed that SHI, which I use to denote both overt or covert versions, explicitly marks the position of focus alternative computation and thus the semantic scope of the higher *éryǐ* (15). In this section I will demonstrate a proof-of-concept syntax/semantics involving focus movement which makes this special contribution of SHI explicit.

4.1. Association via movement

Different technical solutions have been proposed as to how focus operators associate with their focused constituents at LF. Chomsky (1976) proposed a syntactic movement for focus association:

- (20) **Focus movement at LF à la Chomsky (1976):**
 “introduced [Bill]_F to Sue”
 LF: Bill λ_I [introduced t_I to Sue]

A potential challenge to the focus movement approach to AWF is its lack of island-sensitivity: it is well known that focus operators can associate with constituents within syntactic islands (21). One answer to this challenge is to require that a constituent at least as large as the island is focus-moved in such cases (Drubig, 1994) (21’).

- (21) **Focused constituents can be within syntactic islands:** (Krifka, 2006)
 John only introduced [_{island} the man that [Jill]_F admires most] to Sue.
 (21’) **Association into islands by moving a larger constituent:** (Krifka, 2006)
 LF: only(the man that [Jill]_F admires)(λ_I [introduced t_I to Sue])

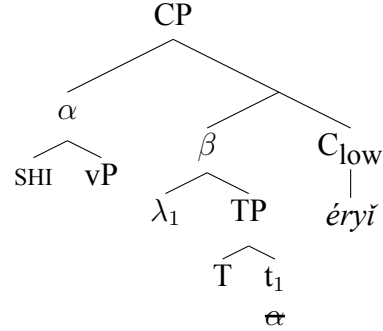
Evidence for this form of focus movement and its unique sensitivities to syntactic islands has been presented from explicit contrasts (contrastive continuations), the unavailability of multiple foci in islands, the interpretation of short answers (Krifka, 2006), and NPI licensing (Wagner, 2006).

4.2. A compositional syntax/semantics for *éryǐ*

One proposal for how SHI marks the position of alternative computation (15) is to take SHI to be a marker of the constituent that is focus-moved at LF. In this section I will entertain this view, presenting a denotation for *éryǐ* which requires focus movement of the SHI-marked constituent below it.

I will illustrate this syntax-semantics first with a basic example, (1b), repeated here as (22). The tree to the right is its LF, post-focus movement. We posit CHI above the vP, where it can optionally be pronounced. α , the constituent marked by *shì*, has been focus-moved. (For the sake of exposition, the subject will be interpreted within the vP via reconstruction.)

- (22) 他 (是) 看 [電視]_F 而已。
 Tā (shì) kàn diànshì éryǐ
 He {SHI, ϕ_{SHI} } watch [TV]_F ERYI
 ‘He only watches [TV]_F.’



The following is the proposed denotation for *éryǐ* (23). The argument Q corresponds to the focus-moved constituent (α in the tree) and the argument P is the “remainder” of the TP after focus movement (β in the tree). Following Beaver and Clark (2008), $[\cdot]^I$ represents the intensional meaning and $[\cdot]^A$ is the alternative set à la Rooth (1985). Assume SHI is semantically vacuous: i.e. $[[\text{SHI } \gamma]]^I = [[\gamma]]^I$ and $[[\text{SHI } \gamma]]^A = [[\gamma]]^A$.

- (23) $[[\text{éryǐ}]]^w = \lambda P_{\langle \tau, t \rangle} \lambda Q_{\tau}. P(\forall \phi \in [[Q]]^A. \phi(w) \rightarrow \phi = [[Q]]^I)$, where $\tau = \text{typeof}(\alpha)$.

We first compute the intensional value of α and its alternative set. The alternative set is computed by considering relevant alternatives to the focused constituent.

- a) $[[\alpha]]^I = [[[\text{SHI vP}]]]^I = [[\text{vP}]]^I = \lambda w. \text{ he watches TV in } w$
 b) $[[\alpha]]^A = [[[\text{SHI vP}]]]^A = [[\text{vP}]]^A = \{\lambda w. \text{ he watches TV in } w, \lambda w. \text{ he watches movies in } w, \lambda w. \text{ he watches plays in } w, \dots\}$

Next we consider the denotation of β . Because the TP here actually had the same denotation as the constituent which was focus-moved, $[[\beta]]$ becomes the identity function.

- c) $[[\beta]] = \lambda \alpha. [[\text{TP}]] = \lambda \alpha_t. \alpha = \text{Ident}_t$

Now we compute the composite denotation $[[\text{(22)}]]$ using the meaning of *éryǐ* proposed.

- d) $[[\text{(22)}]] = 1 \iff [[\text{éryǐ}]]^{w^*}(\beta)(\alpha)$, where w^* denotes the evaluation world.
 $= (\lambda P_{\langle t, t \rangle} \lambda Q_t. P(\forall \phi \in [[Q]]^A. \phi(w^*) \rightarrow \phi = [[Q]]^I)) (\text{Ident}_t)(\alpha)$
 $= (\lambda Q_t. \forall \phi \in [[Q]]^A. \phi(w^*) \rightarrow \phi = [[Q]]^I)(\alpha)$
 $= \forall \phi \in [[\alpha]]^A. \phi(w^*) \rightarrow \phi = [[\alpha]]^I$
 $= \forall \phi \in \{\lambda w. \text{ he watches TV in } w, \lambda w. \text{ he watches movies in } w, \dots\}$
 $\phi(w^*) \rightarrow \phi = (\lambda w. \text{ he watches TV in } w)$

= If any of “he watches TV in w^* ”, “he watches movies in w^* ”, etc., is true, it must be that he watches TV.

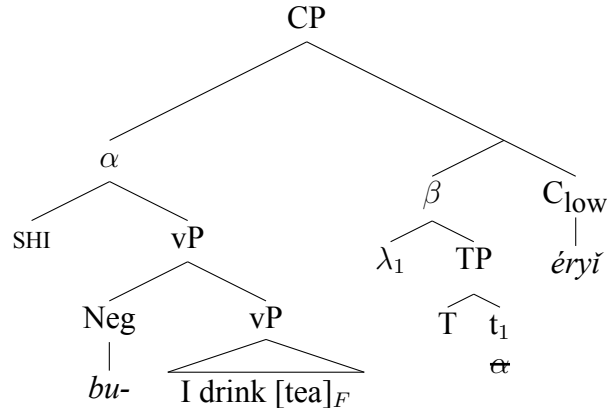
The truth condition expressed in this result matches our expected meaning for (22): namely, that “he watches X ” can only be true if X = “TV.”

Now let us see how this focus movement computation explicitly derives the puzzling scope contrasts in (9–10). First consider the interpretation of (9), repeated here, where there is no overt focus marker *shì*. As discussed in section 3, the correct parse for (9) interprets the negation as the low negation below ϕ_{SHI} .

(9) 我 不 喝 [茶]_F 而已。 ONLY > NEG, *NEG > ONLY
 Wǒ bù hē chǎ éryǐ
 I NEG drink [tea]_F ERYI

✓ ‘I only don’t drink [tea]_F... I drink everything else.’
 * ‘I don’t only drink [tea]_F... I also drink other things.’

The structure of (9) at LF, after focus movement, is the following:



As the negation is below ϕ_{SHI} , it is contained within the constituent which is focus-moved and thus contributes to the value of $\llbracket \alpha \rrbracket^I$ and the value of all alternatives computed in $\llbracket \alpha \rrbracket^A$. This ensures that the AWF computation of alternatives—and the focus operator which uses its value—takes scope above negation.

- a) $\llbracket \alpha \rrbracket^I = \llbracket [\text{Neg vP}] \rrbracket^I = \lambda w. \text{I don't drink tea in } w$
- b) $\llbracket \alpha \rrbracket^A = \llbracket [\text{Neg vP}] \rrbracket^A = \{ \lambda w. \text{I don't drink tea in } w, \lambda w. \text{I don't drink coffee in } w, \lambda w. \text{I don't drink water in } w, \dots \}$
- c) $\llbracket \beta \rrbracket = \lambda \alpha. \llbracket [\text{TP}] \rrbracket = \lambda \alpha_{t_1}. \alpha = \text{Ident}_{t_1}$

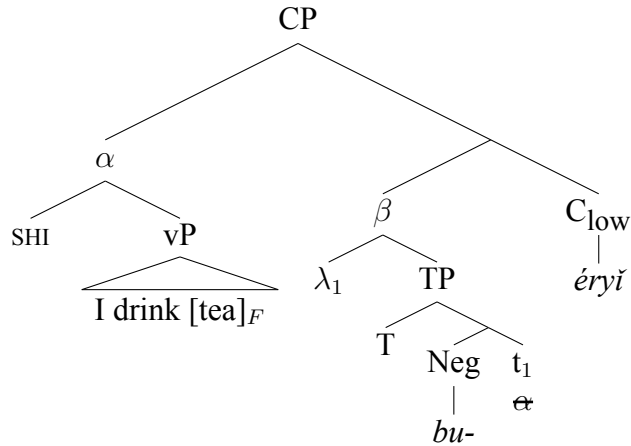
We now compute $\llbracket (9) \rrbracket$ using the denotation for *éryǐ* given previously.

- d) $\llbracket(9)\rrbracket = 1 \iff \llbracket\acute{e}ry\check{y}\rrbracket^{w^*}(\beta)(\alpha)$, where w^* denotes the evaluation world.
- = $(\lambda P_{\langle t, t \rangle} \lambda Q_t. P(\forall \phi \in \llbracket Q \rrbracket^A. \phi(w^*) \rightarrow \phi = \llbracket Q \rrbracket^I)) (\text{Ident}_t)(\alpha)$
 - = $(\lambda Q_t. \forall \phi \in \llbracket Q \rrbracket^A. \phi(w^*) \rightarrow \phi = \llbracket Q \rrbracket^I) (\alpha)$
 - = $\forall \phi \in \llbracket \alpha \rrbracket^A. \phi(w^*) \rightarrow \phi = \llbracket \alpha \rrbracket^I$
 - = $\forall \phi \in \{\lambda w. \text{I don't drink tea in } w, \lambda w. \text{I don't drink coffee in } w, \dots\}$
 $\phi(w^*) \rightarrow \phi = (\lambda w. \text{I don't drink tea in } w)$
 - = If any of “I don’t drink tea in w^* ”, “I don’t drink coffee in w^* ”,
 etc., is true, it must be that I don’t drink tea.
 - \Rightarrow ONLY > NEG

Now consider the interpretation of example (10). Here, the overt *shì* forces the negation to be unambiguously in the higher position, above SHI:

- (10) 我不是喝 [茶]_F而已。 *ONLY > NEG, NEG > ONLY
 Wǒ bù shì hē chā éryǐ
 I NEG SHI drink tea ERYI
 * ‘I only don’t drink [tea]_F... I drink everything else.’
 ✓ ‘I don’t only drink [tea]_F... I also drink other things.’

As such, the negation does not figure in the interpretations of α .



- a) $\llbracket \alpha \rrbracket^I = \llbracket \text{vP} \rrbracket^I = \lambda w. \text{I drink tea in } w$
- b) $\llbracket \alpha \rrbracket^A = \llbracket \text{vP} \rrbracket^A = \{\lambda w. \text{I drink tea in } w, \lambda w. \text{I drink coffee in } w, \lambda w. \text{I drink water in } w, \dots\}$

Instead, the negation is left behind in β , the “remainder” of the TP. This is reflected in the computation of $\llbracket \beta \rrbracket$. $\llbracket \beta \rrbracket$, due to the λ -abstraction, becomes a pure logical negation.

$$c) \boxed{\llbracket \beta \rrbracket = \lambda \alpha. \llbracket \text{TP} \rrbracket = \lambda \alpha_t. \neg \alpha}$$

Combined with our semantics for *éryĩ*, we yield the following truth condition, which functionally reflects negation taking scope over ONLY:

$$\begin{aligned}
 d) \llbracket (10) \rrbracket = 1 &\iff \llbracket \text{éryĩ} \rrbracket^{w^*}(\beta)(\alpha), \text{ where } w^* \text{ denotes the evaluation world.} \\
 &= (\lambda P_{\langle t,t \rangle} \lambda Q_t. P(\forall \phi \in \llbracket Q \rrbracket^A. \phi(w^*) \rightarrow \phi = \llbracket Q \rrbracket^I)) (\lambda P_t. \neg P)(\alpha) \\
 &= \neg ((\lambda Q_t. \forall \phi \in \llbracket Q \rrbracket^A. \phi(w^*) \rightarrow \phi = \llbracket Q \rrbracket^I)(\alpha)) \\
 &= \neg (\forall \phi \in \llbracket \alpha \rrbracket^A. \phi(w^*) \rightarrow \phi = \llbracket \alpha \rrbracket^I) \\
 &= \neg (\forall \phi \in \{\lambda w. \text{I drink tea in } w, \lambda w. \text{I drink coffee in } w, \dots\} \\
 &\quad \phi(w^*) \rightarrow \phi = (\lambda w. \text{I drink tea in } w)) \\
 &= \neg (\text{If any of “I drink tea in } w^* \text{”, “I drink coffee in } w^* \text{”,} \\
 &\quad \text{etc., is true, it must be that I drink tea.}) \\
 &= \text{It’s not the case that [if any of “I drink tea in } w^* \text{”, “I drink coffee in } w^* \text{”,} \\
 &\quad \text{etc., is true, it must be that I drink tea].} \\
 &\Rightarrow \text{NEG} > \text{ONLY}
 \end{aligned}$$

Thus (10) is interpreted as NEG > ONLY, even though the *only* word itself, *éryĩ*, is in a higher syntactic position. This focus movement approach is able to make the semantic import of SHI explicit.

4.3. Evidence from contrastive continuations

One class of evidence for covert focus movement comes from “explicit contrast” constructions (Drubig, 1994; Krifka, 2006), which I will call *contrastive continuations*:

(24) **A contrastive continuation must be at least as large as the constituent which is focus-moved:** (Krifka 2006)

Mary didn’t invite [_{island} the man in a [black]_F suit] to the party,

- a. ✓ but [she invited the man in a [purple]_F suit].
- b. ? but [the man in a [purple]_F suit].⁹
- c. * but [in a [purple]_F suit].
- d. * but [a [purple]_F suit].
- e. * but [purple]_F.

⁹Speaker judgements seem to vary on this continuation. Krifka (2006) gives it a ✓.

The generalization is that a contrastive continuation must be at least as large as the constituent that is focus-moved in the initial sentence. In cases where the focused element in the initial sentence is within a syntactic island, the entire island will be focus-moved and so the continuation must be at least as large as that island. The prediction of these contrasts with respect to Mandarin is clear: contrastive continuations in Mandarin must be at least as large as the projection to which *shì* attaches, i.e. vP, as *SHI* explicitly marks the constituent that is focus-moved. We see that this is indeed the case:

- (25) 他不是喜歡 [豬肉]_F,
 tā bú shì xǐhuan zhūròu
 he NEG SHI like [pork]_F
- a. ✓ (可是)他(是)喜歡 [牛肉]_F。
 kěshì tā shì xǐhuan niúròu
 (but) he (SHI) like [beef]_F
- b. ✓ (可是)(是)喜歡 [牛肉]_F。
 kěshì shì xǐhuan niúròu
 (but) (SHI) like [beef]_F
- c. * (可是)[牛肉]_F。
 kěshì niúròu
 (but) [beef]_F

Thus the cross-linguistic generalization on contrastive continuations, which picks out what constituents are focus-moved, picks out precisely the constituent that is marked by *shì* in Mandarin Chinese. This argument supports the approach presented in this section where the projection marked by *shì* is focus-moved at LF.

5. Conclusion and further questions

In this paper, I focused on the understudied Mandarin sentence-final particle, *éryǐ*. In particular, I have established the syntactic contribution of *éryǐ* as a low C head, following the literature on Chinese SFP, and presented a novel and puzzling scope switching effect resulting from the interaction between *éryǐ*, negation, and the focus-marker *shì*.

At the heart of this discussion is my main claim: **that SHI (specifically, the sentence-medial bare *shì* of Paul and Whitman (2008)) unambiguously marks the position of focus alternative computation.** Thus, *éryǐ* can be interpreted with scope below negation, even while being in a higher syntactic position, so long as the alternative set computation occurs within the scope of negation. In addition, I presented a focus movement analysis as a proof-of-concept for how such a computation would occur at LF, with supporting evidence from contrastive continuations.

The proposal laid out here is not without its questions or further directions for pursuit. Focus-moved constituents are normally theorized to be as small as possible, due to restrictions on pied-piping or by Maximize Presupposition (Wagner, 2006). Why must the focus-moved constituent in Mandarin be precisely the projection marked by *shì*? Can this proposal for *shì* be unified with the other types of *shì*-marked focus constructions?

One way to view the data presented here is to conclude that focus-sensitive operators such as *éryǐ* do not trigger AWF themselves but instead are parasitic on the alternatives computed by a dedicated AWF marker, *shì*. Indeed, *shì* may be an overt version of Rooth's (1992) squiggle operator (\sim) which marks the position of focus interpretation. The data and proposal laid out here point to an exciting new possibility in the cross-linguistic space of possible focus syntax-semantics: the existence of “bipartite” focus-sensitive operators, with one lexical item introducing the “logic” of the focus operator's assertion and another marking the semantic scope of the Association With Focus. Further work in both Mandarin and other languages is warranted in pursuing this new perspective on focus.

References

- Beaver, David, and Brady Clark. 2008. *Sense and sensitivity: How focus determines meaning*. Wiley-Blackwell.
- Biberauer, Theresa, Glenda Newton, and Michelle Sheenan. 2009. Limiting synchronic and diachronic variation and change: The Final-over-Final Constraint. *Language and Linguistics* 10:701–743.
- Chomsky, Noam. 1976. Conditions on rules of grammar. *Linguistic Analysis* 2:303–350.
- Drubig, Hans Bernhard. 1994. Island constraints and the syntactic nature of focus and association with focus. *Arbeitspapiere des Sonderforschungsbereichs 340: Sprachtheoretische Grundlagen der Computerlinguistik* 51.
- Ernst, Thomas. 1995. Negation in Mandarin Chinese. *Natural Language and Linguistic Theory* 13:665–707.
- Horn, Laurence R. 1969. A presuppositional analysis of *only* and *even*. In *Proceedings of CLS 5*. Chicago Linguistics Society.
- Huang, Cheng-Teh James. 1988a. On ‘be’ and ‘have’ in Chinese [說「是」和「有」]. *The Bulletin of the Institute of History and Philology, Academia Sinica* LIX:43–64.
- Huang, Cheng-Teh James. 1988b. *Wo pao de kuai* and Chinese phrase structure. *Language* 64:274–311.
- Jackendoff, Ray. 1972. *Semantic interpretation in generative grammar*. MIT Press.

- Krifka, Manfred. 2006. Association with focus phrases. In *The architecture of focus*, 105–136. Mouton de Gruyter.
- Paul, Waltraud. 2010. Why particles are not particular: sentence-final particles in Chinese as heads of a split CP. *Studia Linguistica* to appear.
- Paul, Waltraud, and John Whitman. 2008. *Shi...* de focus clefts in Mandarin Chinese. *The Linguistic Review* 413–451.
- Rizzi, Luigi. 1997. The fine structure of the left periphery. In *Elements of grammar*, ed. Liliane Haegeman. Kluwer.
- Rooth, Mats. 1985. Association with focus. Doctoral Dissertation, University of Massachusetts, Amherst.
- Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1:75–116.
- Schaffar, Wolfram, and Lansun Chen. 2001. Yes-no questions in Mandarin and the theory of focus. *Linguistics* 837–870.
- Soh, Hooi Ling. 2009. Speaker presupposition and Mandarin Chinese sentence-final *-le*: a unified analysis of the “change of state” and the “contrary to expectation” reading. *Natural Language & Linguistic Theory* 27:623–657.
- Teng, Shou-Hsin. 1978. Remarks on cleft sentences in Chinese. *Journal of Chinese Linguistics* 7:101–113.
- Tsai, Wei-tien Dylan. 2004. On the formal semantics of *zhi* and *lian* [談「只」與「連」的形式語義]. *Zhongguo Yuwen* 2:99–111.
- Wagner, Michael. 2006. Association by movement: evidence from NPI-licensing. *Natural Language Semantics* 14.

Appendix. Utterance-focus *éryǐ*

In example (1), I noted that the utterance with both *zhǐ* and *éryǐ* is interpreted with just one semantic reflex of exclusivity—exactly the same as the alternatives with only *zhǐ* or only *éryǐ*. However, in some particular circumstances, it is possible for *zhǐ* and *éryǐ* to be interpreted as two distinct exclusiveness operators.

- (26) Context: the speaker has been offered tea, but does not drink it. “Why aren’t you drinking the tea?”

我 只 喝 水 而已。
 Wǒ zhǐ hē shuǐ éryǐ
 I ZHI drink water ERYI

‘It’s just that I only drink water... there’s no other reason.’

Note, however, that this potential complication is simply another use of *éryǐ* with a different semantics. In general, *éryǐ* is also able to take the entire proposition as its focus, asserting that it is the only appropriate response in the conversation, especially in cases where an explanation is sought. I refer to these uses of *éryǐ* as “utterance-focus.”

- (27) **Utterance-focus with *éryǐ*:**

Context: the speaker has been offered tea, but does not drink it. “Why aren’t you drinking the tea?”

我 不 喝 茶 而已。
 Wǒ bu hē chǎ éryǐ
 I NEG drink tea ERYI

‘It’s just that [I don’t drink tea]_F... there’s no other reason.’

In contrast, *zhǐ* in sentence medial position cannot introduce utterance-focus.

- (28) ***zhǐ* cannot introduce utterance-focus:**

我 只 不 喝 茶。
 Wǒ zhǐ bu hē chǎ
 I ZHI NEG drink tea

Intended: ‘It’s just that [I don’t drink tea]_F... there’s no other reason.’

In cases where we interpret both an utterance-focus exclusivity and a clause-internal exclusivity, the higher, utterance-focus exclusivity must be the contribution of *éryǐ*, not *zhǐ*. Thus, in (26), *éryǐ* must assert that the entire utterance is the only appropriate utterance, while *zhǐ* associates with the “water” below. It is precisely in this configuration that we see the independent contribution of both *only* items.

Note that this utterance-focus use of *éryǐ* also indicates that it must be in a position to scope above the entire clause, as expected by its low C position.