Mapping VPs to restrictors: Anti-Diesing effects in Mandarin Chinese[*]
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1. Introduction

While many canonical Chinese sentences conform to Diesing's (1992) generalization ('Material from VP is mapped into the nuclear scope'), some non-canonical, though perfectly regular sentence types yield the reverse picture. VPs are regularly mapped to the restrictors of the quantificational structures at hand. The core of the system involves information-structural quantification. Parasitic on this, we find certain kinds of modal quantification.

Almost all of the data in this paper have been taken from Hole (2004), but the emphasis on the parallel quantificational mappings and the comparatively thorough treatment of focus quantification and modality are original to the present paper.

Upon first contact, Mandarin focus marking constructions and modal verb constructions look exactly like their English counterparts. (1) and (2) present two examples.[1]

(1) Lǎo Wáng zhǐ [hē chá].
     Old Wang only drink tea
     'Old Wang only drinks tea.'
(2) Lǎo Wáng bìxū qù   dàshǐguǎn.
     Old Wang must go.to embassy
     'Old Wang must go to the embassy.'

Ignoring subtleties that are irrelevant in the present context, the Mandarin structures and the English renderings are alike. The adverbial focus marker *zhǐ* 'only' in (1) may, just like *only* in the translation, relate to a focus maximally as big as the constituent in brackets. The Mandarin sentence in (2) and its English translation are, again, so similar that I feel at a loss as to how to comment on the structures.

Things change dramatically as soon as we turn to the non-canonical patterns that this paper is is concerned with. (3) furnishes us with a first idea of these patterns.[2]

(3) a. Lǎo Wáng zhǐyǒu [chá] *(cái)   [VP hē].
        old Wang only   tea   CAI   drink
        'Old Wang drinks only tea.'
     b. [There is no p]QUANTIFIER [p ∈ the set of contextually salient alternative propositions P

[1] Unless stated otherwise, a bracketed constituent marks the largest possible relevant focus in the sentence at hand.
[2] Previous important descriptions of *cái* and some or all of the other particles discussed in this paper include Alleton (1972), Paris (1981) and Biq (1984, 1988).

of (3a)]_{RESTRICTOR} [p is true]_{NUCLEAR SCOPE}.[3]
   c. Old Wang drinks tea.

In (3a) the direct object has been preposed, the focus marker has, if compared with (1), been augmented, and an untranslatable, yet obligatory, particle precedes the verb.[4] (3b) is an English paraphrase of (3a) that makes explicit a possible partitioning into quantifier, restrictor and nuclear scope of the focus semantic meaning of (3a). The assertion made by (3a) is given in (3c).[5] The VP in (3a) excludes the focus and is, therefore, plain background together with the subject, which has moved to the leftmost position in the sentence. The opposite was true with adverbial *zhǐ* 'only' in (1), where the VP necessarily contained the focus.

The contrast between (4) (=(2)) and (5) is of a more intricate nature.[6]

(4)   Lǎo Wáng bìxū qù   dàshǐguǎn.
       Old Wang must go.to embassy
       'Old Wang must go to the embassy.'

(5)   [Lǎo Wáng <u>bìxū</u> qù   dàshǐguǎn],*(cái)   néng shēnqǐng qiānzhèng.
       old Wang   must go.to embassy   CAI   can apply.for visa
       '[Old Wang <u>must</u> go to the embassy] to be able to apply for a visa.'/'Only if [Old Wang goes to the embassy] can he apply for a visa.'/ (good without *cái* if interpreted as two main clauses: 'Old Wang must go to the embassy, he can apply for a visa.')

Both sentences have the same modal force; they involve propositions under a necessity operator. The first translation of (5) reflects this fact, but at the cost of obscuring the syntactic facts of subordination. In terms of syntax, the righthand clause of (5) is superordinate, and this fact is preserved more accurately in the second translation of (5). In section 8 we will have an opportunity to understand this sentence type more thoroughly; at the present stage the non-native reader will have to take my word for it that we are really dealing with subordination of the *bìxū*/'must'-clause on the one hand, but that, on the other hand, the overall modal force of the complete complex sentence is necessity, and not possibility as suggested by the occurrence of *néng* 'can' in the righthand matrix clause.

An obvious parallel between (3) and (5) is the fact that both sentences contain the particle *cái*. The generalization that I want to arrive at is that all sentences with particles belonging to the same class as *cái* encode quantificational structures in which the VPs behind the particles are mapped to the restrictors of the quantificational structures at hand. (I will continue to refer to the predicates following *cái* and the other particles as 'VPs', even though they should probably be classified as 'aspect phrases' or 'non-epistemic modal phrases' (Shyu 1995).) This forms a sharp contrast with the VPs of canonical sentences, both in English and in Mandarin (Diesing 1992, Tsai 1994). Just as the VP of *Every boy eats chocolate* is mapped to the nu-

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[3] It is not at all uncontroversial, or even broadly discussed, exactly how focus-background structures are mapped to tripartite quantificational structures. Section 7 is dedicated to this problem. At that point I justify why I make use of (a refined version of) the format chosen in (3b).

[4] The augmented focus marker *zhǐyǒu* is used whenever the focus marker is not in the adverbial position exemplified in (1). Historically, it may be analyzed as 'only' + 'exist', cf. *yǒu* 'have, exist', but a biclausal cleft-analysis for the Chinese sentence in (3a) is, at least synchronically, not feasible. See Hole (2004: 272f) for more details.

[5] As von Fintel (1994: 133) puts it, 'there is an industry devoted to the issue of whether the latter ingredient [i.e., the proposition in the scope of *only*; D.H.] is an implicature (conversational or conventional), a presupposition, or part of the truth conditions. And these days, it is also possible that it is an explicature in the sense of the London school of pragmatics.' I side with the truth-conditional faction, but for the aims of this paper nothing really hinges on this. In what follows, I will refer to the propositions in the scope of 'only'-words as 'asserted'. For an in-depth survey of the theories that researchers defend concerning the status of these propositions, see Horn (1996).

[6] Dotted underlining as in (5) marks a constituent as necessarily unfocused.

clear scope of the encoded quantificational structure, the VPs of modalized sentences are canonically mapped to the nuclear scope. This is illustrated in (6) and (7).

(6) a. Every boy eats chocolate.
     b. $\forall$x [x is a boy]$_{\text{RESTRICTOR}}$ [x eats chocolate]$_{\text{NUCLEAR SCOPE}}$
(7) a. Old Wang must go to the embassy.
     b. $\forall$w [w is a world maximally similar to the ideal worlds in terms of the ordering source at hand, say, worlds in which things only happen the way required by the regulations for the issuing of visas]$_{\text{RESTRICTOR}}$ [Old Wang goes to the embassy in w]$_{\text{NUCLEAR SCOPE}}$

The reader with some background knowledge in the modeling of modality will have noticed that my quantificational paraphrase of (7a) in (7b) relies (in a simplified way) on Kratzer's (1981, 1991a) theory of modality. Familiarity with Kratzer's approach will certainly make sections 8 and 9 of the present paper more readily accessible; my application of Kratzer's theory will not be fully explicit, though, and I will explain things in natural language whenever I make use of notions from her theory. At the present point it suffices to know that, just as in other model-theoretic approaches to modality, necessity is identified with universal quantification over possible worlds (and possibility with existential quantification).

The notion of ordering sources plays a crucial role in Kratzer's theory. Ordering sources result in partial orderings on possible worlds which allow one to determine the similarity of any given possible world with a possible world that is ideal with respect to some property. The ordering source referred to in (7b) is the degree of similarity with those worlds in which only things are the case that conform to the real-world regulations for the issuing of visas.

Let us now turn to the peculiar function of words like *cái* as in (3) in some more detail (sections 3 through 7) before returning to the intricacies of the complex modal structures parasitic on the *cái*-like particles in sections 8 and 9. For better orientation and navigation, Table 1 presents the overall plan of the paper. Shaded cells highlight sections with an emphasis on empirical breadth. Cells delimited by thicker lines correspond to those sections that constitute the theoretical backbone of the paper.

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2. Non-canonical structures I: Conventionalized focus-background agreement	3. Negated existential quantification over alternatives ($\neg\exists$)	7. Mapping focus-background partitionings to tripartite quantificational structures
	4. Universal quantification over alternatives ($\forall$)	
	5. Negated universal quantification over alternatives ($\neg\forall$)	
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8. Non-canonical structures II: Main clauses as modal *ad-hoc* restrictors	8.1 The problem	
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Table 1: Plan of the paper

2. Non-canonical structures I: Conventionalized focus-background agreement
We have seen above that (i) dropping *cái* influences grammaticality, and that (ii) it is impossible to render its function in an English translation. The relevant examples contrasting ca-

nonical adverbial focus-sensitive particles with non-canonical foci co-occurring with *cái* are repeated in (8).

(8) a. Lǎo Wáng (zhǐ) hē chá.
old Wang only drink tea
'Old Wang (only) drinks tea.'
b. Lǎo Wáng zhǐyǒu chá *(cái) hē.
old Wang only tea CAI drink
'Old Wang drinks only tea.'

The same contrast recurs with 'even'-foci; cf. (9).

(9) a. Lǎo Wáng (shènzhì) bù hē chá.
old Wang even not drink tea
'Old Wang doesn't (even) drink tea.'
b. Lǎo Wáng lián chá *(dōu) bù hē.
old Wang even tea DOU not drink
'Old Wang doesn't even drink tea.'

Just as with *zhǐ* 'only' in (8), the adverbial focus marker *shènzhì* 'even' in (9a) may be dropped without influencing grammaticality, while the *lián*-marked preposed object in (9b) goes hand in hand with the obligatory preverbal particle *dōu*.[7]
The generalization in (10) holds in the overwhelming majority of cases.

(10) If a focus that is marked for a specific type precedes the VP, a particle at the left edge of the VP must be used.

Since the particles at the left edge of the VP co-vary with the semantic type of focus preceding the VP, the resulting system may be analyzed as an agreement mechanism.

(11) Backgrounded VPs agree with their preceding foci. The agreement morphemes are the particles at the left edge of the VP, and the agreement categories are the different kinds of focus for which the preceding foci are marked (e.g., 'only'-foci or 'even'-foci).

I review the few exceptions to (10) and (11) in Hole (2004: 52, 72, 174), but they don't seem to threaten the validity of the generalizations in a serious way. Note in passing that the marking of the preverbal foci may be implicit as in (12), but that this doesn't undermine (11). (This is not to say that the foci in (12) are not marked as such by prosodic means. What matters is that there are no pronounced segments in (12) which may be analyzed as focus markers.)

(12) a. Lǎo Wáng [chá] cái hē.
old Wang tea CAI drink
'Old Wang drinks only tea.'
b. Lǎo Wáng [chá] dōu bù hē.

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[7] This *dōu* is diachronically related to the comparatively well-known distributive *dōu* 'each' as, for instance, studied by Lin (1996, 1998), but it cannot be identified with it at a synchronic level. See Hole (2004: ch. 4.3.1) for the detailed justification for keeping the two uses of *dōu* apart. The most important argument for a strict separation of the distributivity marker and the focus-related *dōu* under scrutiny here is that distributive *dōu* must be preceded by an XP with a(n inherently) plural denotation. No such restriction is active with the *dōu* studied here, at least not if only the ordinary meaning to the exclusion of the focus meaning (in the sense of Rooth 1985) is taken into account. We will see below that our *dōu* indeed interacts with the pluralities in the focus meanings of the sentences in which it occurs.

old Wang   tea   DOU not drink
'Old Wang doesn't even drink tea.'

The only alternative to assuming implicit or contextual focus marking in (12) would be to say that *cái* and *dōu* themselves are the focus marking devices. This would leave us with an undesirable homonymy stipulation for the particles; they would be agreement particles in (8b) and (9b), but focus markers in (12).

The generalizations in (10) and (11) are not just valid for direct objects and other canonically postverbal material. They likewise apply to elements that never occur in postverbal positions to begin with. (13) provides two examples involving complex sentences.

(13) a. Zhǐyǒu [Lǎo Wáng   lái],   wǒ *(cái) qù.
      only.if old Wang   come   I   CAI   go
      'Only if [Old Wang comes] will I go.'
    b. Jíshǐ   [Lǎo Wáng   lái],   wǒ *(dōu) qù.
      even.if old Wang   come   I   DOU   go
      'Even if [Old Wang comes], I will go.'

Over the past decade, syntacticians from the generative tradition have come up with several minimalist accounts to get a grip on the syntax of this construction (Gao 1994, Shyu 1995, Zhang 1997, 2000). However, the feature checking analyses that were formulated leave open the question of what makes the observed system a system from the point of view of function or semantics. This is the question that I have addressed in some detail in Hole (2004).

To conclude the present section, I will give a summary of the overall architecture of this subsystem of Mandarin grammar. I will then (sections 3–6) move on to describe each focus quantificational type in turn, and I will aim at justifying the arguably most controversial type of conventionalized focus quantification that I propose, viz. negated universal quantification over alternatives. Readers with a less urgent interest in the empirical unfolding of the Mandarin system and with a prevalent curiosity about the mapping of focus-background structures to quantificational structures may skip the following data-oriented sections (except, perhaps, for the section on *jiù*, viz. section 5.) and continue with section 7.

A summary of major features of the focus quantificational system of Mandarin focus-background agreement is given in (14).

(14) a. Each classic quantificational type ($\exists$, $\forall$, $\neg\exists$, $\neg\forall$) constitutes a basic agreement category in Mandarin focus-background agreement.
    b. Each focus quantificational type is covered by a distinct agreement marker.
    c. Negated universal quantification ($\neg\forall$) forms an integral part of this system, despite claims found in the literature that this type of quantification does not conventionalize/hardly ever conventionalizes.

3. Negated existential quantification over alternatives ($\neg\exists$)
Negated existential quantification is the focus type which triggers the use of *cái*. No contextually salient alternative is true. The most important relevant focus marker in English is *only*. In the formal semantics tradition, the special focus semantics of this focus type is usually characterized in a different way, viz. as a kind of universal quantification. In that tradition the 'only'-entailment is expressed by formulae which state roughly the following: All the true alternatives to the assertion must be identical with the assertion. I will return to the difference between these traditions in section 7. There I will also defend why I make use of the more traditional quantificational format involving negated existential quantification.

In most cases, translations of sentences with *cái* into English will make use of words like *only*, *merely*, etc.; moreover, *not...until*-sentences belong in this domain.

(15) presents some Mandarin sentences whose foci trigger the obligatory use of *cái*. Each example is supplemented by a rendering which makes the respective focus semantic component of meaning explicit.

(15) a. PREPOSED OBJECT IN FOCUS
         Lǎo Wáng zhǐyǒu [chá] *(cái) hē.   (=(3a),(8b))
         old Wang   only   tea   CAI   drink
         'Old Wang drinks only tea.'
     a′. 'There is nothing, apart from tea, that Old Wang drinks.'
     b. SUBORDINATE CLAUSE (PARTIALLY) IN FOCUS
         Zhǐyǒu [Lǎo Wáng   lái],   wǒ *(cái)   qù.   (=(13a))
         only.if old Wang   come   I   CAI   go
         'Only if [Old Wang comes] will I go.'
     b′. 'There's no condition, apart from Old Wang coming, under which I will go.'
     c. TIME ADVERBIAL IN FOCUS
         Xiǎo Wáng   zhídào [bā-diǎn]   *(cái)   lái.
         little Wang   until   8-o'clock   CAI   come
         'Little Wang only came at eight o'clock.'/'Little Wang did not come until eight o'clock.'
     c′. 'There is no point in time, apart from eight o'clock (and trivial later points in time), such that Little Wang came at that point in time or before that.'[8]

For more details, especially concerning Mandarin 'only-if'-conditionals and constructions with 'until'-foci or temporal 'only'-foci, cf. Hole (2004: 121–38).

4. Universal quantification over alternatives (∀)
As seen in (9b) and (13b), 'even(-if)'-constructions fall under that focus-semantic category which is agreement-marked by *dōu*. The proper treatment of 'even'-foci has been a recurrent topic over the past two or three decades. Krifka (1995) has – in my eyes, convincingly – corroborated the claim that universal quantification over focus alternatives is the right quantificational notion to deal with 'even'-constructions. Thus, a sentence like *John doesn't even eat chicken meat* will presuppose that John doesn't eat any of the contextually salient kinds of meat either, say, beef, or pork. The way in which 'even'-foci are treated by the grammar of Mandarin underpins Krifka's claim, because 'even'-foci are reliably marked by *dōu* (or *yě*; see section 7). The two other large areas where *dōu* marks backgrounded VPs are, (i), constructions with (strong) negative polarity items (cf. (16)) and, (ii), constructions with free-choice items (cf. (17)).

(16) a. SMALLEST-QUANTITY PREDICATES AS NPIS   (*penny/dime*-type NPIS)
         Lǎo Wáng   yī-[dī]   jiǔ   *(dōu)   méi   hē.
         old Wang   1-drop   wine   DOU   not.have   drink
         'Old Wang hasn't had a [drop] of alcohol.'
     b. INDEFINITE PRONOUNS AS NPIS (*anything*-type NPIS)
         Lǎo Wáng [shénme]   *(dōu) bù   chī.

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[8] This paraphrase presupposes a specific analysis of the denotation of temporal adverbials as in (15c). The basic idea developed in Hole (2004: 126–9) is that all adverbial temporal *cái*-foci, and not just the ones marked by *zhídào* 'until', must be analyzed as relating to the set of points in time before and including the point in time overtly mentioned. This analysis strives to solve one half of the long-standing paradoxes tied to scalar words like *erst* 'only, not...until' in German (cf. König 1979, Löbner 1989).

old Wang   anything/what   DOU   not   eat
'Old Wang doesn't eat [anything at all].'

Both negative polarity constructions and free-choice constructions can be shown to involve universal quantification over focus alternatives. The propositions underlying each sentence in (16) are semantically stronger than any relevant alternative propositions that have a semantically more specific term in the position of the NPIs. If Old Wang, as in (16a), doesn't drink a drop of alcohol, any other quantity is likewise excluded as being consumed by him, simply because any alternative quantitity will be larger than one drop, and any assertion of a proposition with such a larger amount of alcohol instead of 'one drop' is already entailed by the assertion of (16a). In Krifka's theory, an NPI like *shénme* 'what/anything' as in (16b) denotes '$\lambda x.x$ is a thing', i.e. the most general property that any thing has. Therefore, if Old Wang in (16b) doesn't eat anything that has the property of being a thing, he doesn't eat anything at all, because every alternative nominal predicate will entail that property. In both cases, the assertion allows us to make a statement concerning all relevant alternative propositions, viz. that they are all true. In line with the tradition starting with Ladusaw (1979) and defended by Heim (1984), the restricted distribution of NPIs is thus made to follow from the monotonicity behavior of contexts in which NPIs may occur.

The case of free-choice items as illustrated in (17) is different.[9]

(17) a. INDEFINITE PRONOUNS AS FREE-CHOICE ITEMS
          Wúlùn   shéi *(dōu) lái.
          no.matter who DOU   come
          'No matter who, everyone comes.'
      b. A-NOT-A-QUESTION DISJUNCTIONS AS FREE-CHOICE ITEMS
          Lǎo Wáng bùguǎn   xià bu   xià   yǔ   *(dōu) huì lái.
          old Wang no.matter fall not fall rain DOU   will come
          'Old Wang will come, no matter whether it's raining (or not).'

In these cases the set of alternative propositions is not characterized by different, that is, stronger predicates than the highly general predicates '$\lambda x.x$ is a human' for *shéi* or '$\lambda x.x$ is a thing' for *shénme* as with the NPIs in (16); instead, all the possible different propositions resulting from (arbitrarily) fixing the referent of the pronominal in (17a) define the relevant domain of quantification. If the model with respect to which (17a) is interpreted contains the individuals John, Bill and Mary, then (17a) will say that, e.g. *John comes* is true, but that *Bill comes* and *Mary comes* would likewise have been true; or that (if the reference of the free-choice item is fixed differently) *Bill comes* is true, but that *Mary comes* and *John comes* would likewise have been true; or that, finally, *Mary comes* is true, but that *John comes* and *Bill comes* would likewise have been true. If we interpret the focus accent on the free-choice item in (17a) as being a focus on the choice function (cf. von Heusinger 2002), with this focus relating to alternative choice functions that could have been selected to assign the variable a value, then it becomes clear why the kind of quantification at hand is a sub-type of focus quantification.

Admittedly, the above reasoning is just an outline of an analysis that subsumes Mandarin free-choice sentences as in (17a) under a more general focus semantic analysis. If it were to be spelled out in an explicit syntax-semantics framework à la Heim & Kratzer (1997), one would

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[9] Never mind the fact that both *shéi* in (17) and *shénme* in (16) belong to the same class of indefinite pronouns in Mandarin. In Hole (2004: 223) I present evidence to the effect that the Mandarin negative polarity construction with indefinite pronominals must be kept strictly separate from Mandarin free-choice constructions with indefinite pronominals.

have to implement the choice function as a constituent of its own such that it alone may be focused and relate to alternative choice functions.

Although seemingly different, the disjunctive case in (17b) is entirely parallel. Note for a start that the basic kind of *yes/no*-question formation in Mandarin is disjunctive. (18) provides an example.

(18) Nǐ   qù   bu   qù?
     you go   not go
     'Are you going?'

In correspondence with a Hamblin-style semantics of questions (Hamblin 1973), *yes/no*-questions are formed by juxtaposing representatives of the possible answers, namely the negated and the non-negated predicates. This kind of juxtaposition behind *wúlùn* 'no matter' in (17b) has the very same function as the free-choice item *shéi* in (17a); the positive or the negative value may be chosen, but only one. Whichever value is chosen, the assertion will always come out true and this, again, boils down to universal quantification over alternatives. This concludes the small survey of sub-kinds of universal quantification over focus alternatives in Mandarin which trigger the use of *dōu*. Let us now turn to the interesting and potentially more controversial case of negated universal quantification over alternatives.

5. Negated universal quantification over alternatives ($\neg\forall$)

5.1 Basic facts

The right-hand lower O corner of the classic square of opposition is the step-child of traditional theories of quantification. Horn (1972) was among the people to notice the fact that negated universal quantification rarely finds conventionalized lexical expression. Sequences of quantifiers like English *not all* do not lead to complex quantifiers of the type **nall*, even though contractions in the domain of quantifiers expressing negation plus something else are the diachronic norm in Germanic languages. Two kinds of research traditions in this domain may be distinguished. One line of argumentation says that there is something wrong with the traditional square of opposition, and that the lack of quantifiers like **nall* is to be expected, because the required type of quantification can be reduced to something else. Such an analysis has recently been formulated by Seuren (2003). The other tradition will say that the square of opposition is fine the way it has been handed down to us from Aristotle, Boethius and the Middle Ages, but that independent factors render the quantificational type 'not all' unnecessary or dysfunctional in most natural language interactions. This dysfunctionality or rareness of use obstructs lexicalization processes. Horn (1989, this volume?) is a proponent of such a 'good idea – no gain' approach to the lexical gap in the square of opposition. He couches his argumentation in the context of neo-Gricean implicature reasonings, complemented by an empirically well-grounded principle which gives precedence to the lexicalization of non-negated terms over the lexicalization of negated ones. Lexicalization of existential quantification, complemented by analytically expressed inner negation, will yield the O-type of quantification if needed, because $\exists\neg$-type quantification is equivalent to $\neg\forall$-type quantification. Moreover, and this is where the neo-Gricean tradition kicks in, most contexts of use will simultaneously allow for the two competing quantificational statements *Some x's are y* (existential quantification, or the lower left-hand I corner of the square of opposition) and *Not all x's are y*; the contexts in which only $\neg\forall$ is true are negligible from the point of view of lexicalization needs. Löbner (1990) has independently demonstrated that the lexicalization gap in the $\neg\forall$-corner is just a matter of degree, and he collects several four-membered lexical fields covering each corner of the square of opposition.[10]

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[10] Examples from German include the two quadruples in (i) and (ii) (Löbner 1990: 89):

5.2. Negated universal quantification and focus semantics

One of the aims of this article is to add plausibility to the Horn-Löbner position, and to discredit the idea that the square of opposition is a flawed construct. I would also like to demonstrate that what is a negligible quantificational option in some empirical domain of quantification is a highly natural one in another.

What would negated universal quantification over focus alternatives amount to? Let us imagine a discourse in which the eating habits of your little nephew are discussed. You want to cook some vegetables for him, but it turns out he likes neither broccoli nor spinach, and he doesn't like bell peppers either. You may ask *What do you like then?* in this situation, and your nephew may reply as in (19a).

(19) a. I like carrots. I like tomatoes, too.
     b. I like carrots, poo.

What (19a) leaves open is whether apart from carrots and tomatoes there are other vegetables that he likes. The presupposed information tied to the use of *too* in this context is that, apart from tomatoes, at least one more kind of vegetable is already in the background as a kind of vegetable that he likes (namely, carrots). (19b) contains the non-existing particle *poo*. It is meant to capture that presupposition that negated universal quantification over alternatives would amount to. By using it, your nephew would relate back to the information already established, namely that he doesn't like broccoli, spinach, and bell peppers. What it leaves open, though, is whether there are other kinds of vegetables apart from carrots that he likes to eat. Gast (2004) claims that English *at least*, in one of its uses, carries such a presupposition in addition to some scalar component of meaning. Note that such a focus quantificational type is not useless if compared with the existential type instantiated by *too*. It is, in fact, more informative in one respect than *too* (or, to be more precise, it presupposes more information in one respect). *Poo* necessarily separates the domain of alternatives (including the asserted alternative) into complementary subsets, because not all alternatives are the same. *Too* leaves open the possibility that all alternatives are alike. *Poo* is not just another way of relating to a background that would also be compatible with *too*. *Too* says that the information in the assertion is in line with some presupposed bit of information. *Poo* does the exact opposite; it relates back to information that is *not* in line with the assertion. Seen from this angle, the big difference between *too* and *poo* on the one hand, and *only* and *even* on the other, is that *only* and *even* warrant statements about all alternatives, whereas *too* and *poo* only warrant statements about some alternative(s).

5.3 Negated universal quantification and Mandarin information-structure

If a *poo*-type focus semantics can be defended as a possible kind of relating asserted information to the background on general grounds, and if it is less extreme in the requirements that it puts on the set of alternatives than, say, *only*, we will expect to find a relatively high token frequency of the respective focus type in languages in which it is conventionalized. The Mandarin particle *jiù*, which I claim to be the background marker of $\neg\forall$-focus semantics, in fact has the highest token frequency in texts and conversations among the four particles investigated here and in Hole (2004).

Here are two Mandarin examples that give us a first impression of how *jiù*-sentences work.

(i) *ermöglichen – erzwingen – verhindern – erübrigen* ('make possible – enforce – obviate – render unnecessary')
(ii) *möglich – sicher – ausgeschlossen – fraglich* ('possible – sure – impossible – questionable').

(20) a. Ōuzhōu rén   dāng zhōng, [Ìdàlì rén]   jiù   zhǎng-zhe hēi   tóufa.
       Europe people among   Italy people JIU grow-ASP black   hair
       'Among Europeans, [Italians] have black hair.'
   b. #Dōng-Yā rén   dāng zhōng, [Rìběn rén] jiù   zhǎng-zhe hēi tóufa.
       east-Asia people among   Japan people JIU grow-ASP black hair
       'Among the people from East Asia, the [Japanese] have black hair.'

(20a) is fine, because among the alternatives that are explictly referred to, there are peoples whose members are generically said to have fair hair, say, Norwegians (let's disregard the true proportion of fair-haired people among Norwegians for the sake of the argument and stick to the stereotype). (20b) is infelicitous, and this fits in well with our theory about *jiù*, because we know that among the competitors from East Asia, all others (stereotypically) have black hair, too. One might object now that this minimal pair relies on a rare kind of discourse setting, and that not many situations will arise in which sentences like (20a) with the required focus-background structure are uttered. This is true, and the real domain of application for our allegedly exotic focus type is somewhere else, viz. in the domain of contrastive topics. Look at (21), in which the contrastive topic and the focus have been marked.

(21) Rúguǒ xīngqītiān   tiānqì   [hǎo]_CT, wǒ   jiù   [qù pá   shān]_F.
     if   Sunday   weather good I   JIU go climb mountain
     'If the weather is [fine]_CT on Sundays, I [go mountain climbing]_F.'

(21) is uttered by a passionate mountain climber, and the sentence, with the indicated information structure and uttered in a suitable context, amounts to the following: (i) The speaker goes mountain climbing on Sundays if the weather is fine, (ii) he may go mountain climbing if the weather is not 100 per cent fine, but (iii) not all weather conditions are such that he will go mountain climbing on Sundays, e.g. if there is a snow-storm, or heavy rain. (i) is the assertion of (21), (ii) is what is left open by the conditional semantics induced by *rúguǒ/if*-subordination, and (iii) amounts to the information-structural component of meaning brought into the sentence by the contrastive topic accent on *hǎo* 'good', and reflected by agreement *jiù*. At an intuitive level, the relation between contrastive topics and negated universal quantification over alternatives seems straightforward. But to make the link explicit turns out not to be so easy.

5.4 Problems with contrastive topics
It is not quite clear whether contrastive topics, just by themselves, generally presuppose the falsity of an alternative proposition that differs in the position of the contrastive topic. Imagine a context in which a teacher has a pile of students' essays on his desk, and he must evaluate them all. He grades the first one, and it is really good. The teacher says to himself: *The [first]_CT one was [really good]_F*. If later on it turns out that all essays are really good, this doesn't make his statement, which was uttered after the first essay, infelicitous. This seems to support the idea that contrastive topics do *not* carry a presupposition to the effect that one alternative is false. But this conclusion is too hasty. Our teacher made his statement at a point when he wasn't fully informed about the quality of all papers. His natural assumption at this point was most likely that not all other papers are equally good. Let us, therefore, change the context in such a way that the teacher grades all papers first, and they are all really good. He starts to copy the grades (only As and Bs) into his notebook, and if he says to himself *The [first]_CT one was [really good]_F* now, this is odd. With the complete information about the comparable quality of all other papers, the contrastive topic is no longer felicitous. A single focus accent on *first* would, on the other hand, not be infelicitous, and a statement to the same effect for all other papers is possible (*The [second]_F one was really good, The [third]_F one was*

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really good, … The [*last*]_F *one was really good,* [*All*]_F *were really good*). So there does seem to be a difference between foci and contrastive topics as regards the exclusion of at least one alternative. Still, this conclusion may again be too hasty. If the general idea of Büring's (2003) approach to contrastive topics as discussed below is on the right track, and if, specifically, contrastive topics always signal that at least one more assertion with another contrastive topic precedes or follows an utterance with a contrastive topic in an ideal discourse, then a less direct explanation becomes feasible. According to such a view, contrastive topics just seem to presuppose the falsity of at least one alternative because if no alternative was wrong, the simpler focusing strategy without contrastive topics could have been chosen.

I will not favor either solution here as far as a general theory of contrastive topics is concerned. As to the kinds of discourses which trigger the use of *jiù* in Mandarin I will, however, be more explicit. If *jiù* has the grammatical kind of function that I claim it has, then contrastive topics triggering the use of *jiù* must carry a presupposition to the effect that not all alternatives are true.

A second problem has to do with the very fact that *jiù* is triggered by a contrastive topic, and not by a focus. This is not a trivial problem if the idea of negated universal quantification over alternatives is to be combined with the account of contrastive topics developed by Büring (1997, 2003). The matter will ultimately be left unsettled, but I will nevertheless try to say how Büring's account of contrastive topics would have to be amended to fit in with the special kind of contrastive topics under scrutiny here, viz. those that trigger the use of *jiù*.

In Büring's system, contrastive topics are a kind of second-order foci. A contrastive topic doesn't relate to a set of alternative propositions, but to a set of sets of alternative propositions. What is meant by this? Take the sentence in (22a) and its Rooth-style focus meaning in (22b).[11]

(22) a. Paul [goes mountain climbing]_F.
      b. ⟦(22)⟧^f_{C3}={*Paul goes mountain climbing*, *Paul goes bird watching*, *Paul stays at home and rearranges his stamp collection*, *Paul plays the flute*}

With a focus as indicated in (22a), this sentence may have the contextually restricted focus meaning in (22b), viz. a set of propositions that may differ from the assertion only in the position of the focus. The denotation of the question *What does Paul do?* in a Hamblin-style semantics of questions (Hamblin 1973) looks the same. In other words, focus meanings correspond to denotations of questions.

Contrastive topics have a recursive focus denotation. Büring's rule of CT-/contrastive topic-value formation is given in (23) (Büring 2003: 519; the formal definition is found on p. 539).

(23) CT-value formation:
      step 1: Replace the focus with a *wh*-word and front the latter […].
      step 2: Form a set of questions from the result of step 1 by replacing the contrastive topic with some alternative to it.

Let us apply this procedure to the sentence in (24a).

(24) a. If the weather is [fine]_{CT} on Sundays Paul [goes mountain climbing]_F.
      b. step 1: What does Paul do if the weather is [fine]_{CT} on Sundays?
         step 2: {*What does Paul do if the weather is fine on Sundays?*, *What does Paul do if*

the weather is really bad on Sundays?, What does Paul do if the weather is neither good nor bad on Sundays?}

Büring's main claim concerning the felicity of a sentence with a C-topic is that all of the questions that we got as a result of applying step 2 of (23) must be 'under discussion' or, in the terminology of Büring (2003), that a sentence with a C-topic must 'indicate a strategy'. 'Indicating a strategy', means what was just said, viz. that the surrounding (idealized) discourse contains other questions and other answers that only differ in the positions of the foci and the C-topics and that fully exhaust the super-question under discussion. A plausible super-question in our context would be something like *What does Paul do on Sundays?* The set of sub-questions is defined by bringing the weather conditions into play, and the resulting set of sub-questions has been given in (24b), step 2. And, indeed, uttering (24a) seems to require a surrounding discourse like one in which the questions of (24b), step 2, are answered one after the other. If questions denote sets of possible answers, then we can rewrite the result of applying step 2 of CT-value formation in (24) as in (24b′), step 2.

(24) b′. step 2: {{*If the weather is fine on Sundays Paul goes mountain climbing, If the weather is fine on Sundays Paul goes bird watching, If the weather is fine on Sundays Paul stays at home and rearranges his stamp collection, If the weather is fine on Sundays Paul plays the flute*},
{*If the weather is really bad on Sundays Paul goes mountain climbing, If the weather is really bad on Sundays Paul goes bird watching, If the weather is really bad on Sundays Paul stays at home and rearranges his stamp collection, If the weather is really bad on Sundays Paul plays the flute*},
{*If the weather is neither good nor bad on Sundays Paul goes mountain-climbing, If the weather is neither good nor bad on Sundays Paul goes bird-watching, If the weather is neither good nor bad on Sundays Paul stays at home and rearranges his stamp collection, If the weather is neither good nor bad on Sundays Paul plays the flute*}}

If (24b′), step 2, is what Büring calls the CT-value of (24a) in an appropriate discourse context, then it should *mutatis mutandis* also be a possible CT-value of our Mandarin example (21), repeated here as (25).

(25) Rúguǒ xīngqītiān tiānqì [hǎo]$_{CT}$, wǒ jiù [qù pá shān]$_F$.
      if   Sunday   weather good I   JIU go   climb mountain
      'If the weather is [fine]$_{CT}$ on Sundays, I [go mountain climbing]$_F$.'

Now, the problem is as follows: if the CT-value of (25) is as in (24b′), step 2, then negated universal quantification over alternatives cannot "see" the right kind of entity. Since the CT-value consists of sets, quantificational procedures which take these sets as inputs will not allow for statements about individual propositions. What we need is a statement to the effect that the intersection of the true propositions with the alternative propositions has at least one member less than the set of alternative propositions. But we have no set of alternative propositions in the CT-value, we only have a set of *sets* of propositions. If we were somehow allowed to form the generalized union over the CT-value we would arrive at the right kind of object. The generalized union of the CT-value of (25) is given in (26).

(26) {*If the weather is fine on Sundays Paul goes mountain climbing, If the weather is fine on Sundays Paul goes bird watching, If the weather is fine on Sundays Paul stays at*

home and rearranges his stamp collection, If the weather is fine on Sundays Paul plays the flute,
If the weather is really bad on Sundays Paul goes mountain climbing, If the weather is really bad on Sundays Paul goes bird watching, If the weather is really bad on Sundays Paul stays at home and rearranges his stamp collection, If the weather is really bad on Sundays Paul plays the flute,
If the weather is neither good nor bad on Sundays Paul goes mountain climbing, If the weather is neither good nor bad on Sundays Paul goes bird watching, If the weather is neither good nor bad on Sundays Paul stays at home and rearranges his stamp collection, If the weather is neither good nor bad on Sundays Paul plays the flute}

This is a step ahead, because now we simply have the set of alternative propositions that formerly made up the sub-sets of the CT-value (I have retained the paragraphs of the original CT-value in (24b′), step 2, for perspicuity only). This conforms to the focus meaning of a sentence with two foci. Now the proposition that we would minimally want to sort out under the assumption of $\neg\forall$-type quantification and given a plausible context (*If the weather is really bad on Sundays Paul goes mountain climbing*) is readily accessible, because the contrastive topic is treated like a focus.

But (26) is not without problems, either. Other propositions which we definitely do not want to be possible singular candidates of exclusion are likewise accessible. As the set of propositions in (26) stands, nothing prevents the exclusion of, say, the second proposition of the first paragraph of propositions in (26) (*If the weather is fine on Sundays Paul goes bird watching*). But this doesn't conform to the intuitions that speakers report for (25). If a single alternative is excluded to conform to the $\neg\forall$-requirement of the information-structural category triggering the use of *jiù*, then this alternative should differ from the asserted proposition in the position of the C-topic. Only propositions with an alternative to *fine* weather should be considered, i.e. propositions from paragraph 2 or 3 in (26), and it should be excluded that Paul goes mountain climbing under these alternative weather conditions. This problem of over-generation is easily fixed, though. The alternatives that may be considered for possible exclusion should not be of such a kind that they contradict the asserted proposition to begin with. Put differently, propositions that contradict the assertion should be sorted out from the set of alternatives/the generalized union of the CT-value before $\neg\forall$-quantification applies. We only want information-structural quantifiers to sort out alternatives that aren't trivially sorted out anyway by just looking at the entailments of the assertion. A conditional like *If the weather is fine on Sundays, I (always) go mountain climbing* entails, on its strict reading, the falsity of sentences like *If the weather is fine on Sundays, I (always) go bird watching*, or *If the weather is fine on Sundays I (always) stay at home and rearrange my stamp collection*. This means that the first paragraph of alternatives from (26) is eliminated from consideration for the exclusion of at least one alternative.

With these provisions added, contrastive topics and *jiù*-type information-structure appear compatible. What I must leave for another occasion is the matter of comparing contrastive-*jiù*-topics as modeled here with Büring-style contrastive topics more thoroughly. It would be interesting to check in more detail how the empirical advantage of Büring's layered CT-values (cf. Büring 2003: 521–2) are compensated in the system favored here in which a flat set of alternatives is supplemented by a more restrictive way of delimiting the set of alternative propositions that are relevant in a given sentence with a contrastive topic and a focus. The goal in the present paper could only be to show the general plausibility of an attempt to reconcile negated universal quantification over alternatives with contrastive topichood.

5.5 *Jiù* and the *nall*-constraint

Let's briefly return to the frequently observed lexicalization gap in the ¬∀-corner of the square of opposition, the *nall*-constraint. In Hole (2004: 70–1) I discuss the lack of uncontroversial focus markers triggering the use of *jiù*. *Jiù*, itself being an agreement marker, is hardly ever used with focus or contrastive topic markers preceding the focus or contrastive topic (cf. (20) and (21), where no such focus marker is used, either). That is, ¬∀-focus quantification is not typically marked overtly; it is just the agreement marker that finds conventionalized expression. Viewed from this angle, the *nall*-constraint has its repercussions in Mandarin, but only in the domain of focus marking, and not in the domain of focus-background agreement.[12]

6. Existential quantification over alternatives (∃)

6.1 Delimiting agreement-*yě* and focusing *yě*

Existential quantification over focus alternatives amounts to the *also*-kind of focus quantification, often referred to as 'additive focusing' (König 1991). If I buy also shoes, this presupposes that there is something else which I buy. In a way that Hole (2004) is not fully explicit about, this kind of background marking is a bit problematic in Mandarin. One problem arises from the fact that the typical adverbial focus marker of existential focus quantification and the related agreement marker are homophonous. Both functions are fullfilled by *yě*. It is, therefore, more difficult to see right from the start that a focus marker *yě* and a background marker *yě* should be distinguished. (27) gives two examples, the first one illustrating a clear case of (omissible) focus marking by *yě*, and the second one a clear case of (obligatory) agreement marking by *yě*.

(27) a. FOCUS-MARKING *YĚ*
   Lǎo Wáng (yě) hē-le chá.
   old Wang also drink-PRF tea
   'Old Wang (also) drank tea.'
  b. AGREEMENT-*YĚ*
   Lǎo Wáng lián chá *(yě) bù hē.
   old Wang even tea YE not drink
   'Old Wang doesn't even drink tea.'

A second minor issue arises from the ability of focus-marking *yě* to occur in adverbial position *after* its focus, and this topological property, normally reserved for the set of focus-background agreement particles, adds to the difficulty of keeping the two uses of *yě* apart. However, the ability of focusing *yě* to occur after its focus is entirely parallel to the English use of stressed *also* in PAUL has ALSO arrived. Just as *also* must be stressed in such sentences with preceding contrastive topics (cf. Krifka 1998), non-agreement *yě* must be stressed under the same circumstances. Agreement particles are never stressed. The interested reader is referred to Hole (2004: 42–4) for the more detailed justification of distinguishing a separate non-agreement marking use of *yě*.

6.2 An asymmetry in the system

The third peculiarity to be observed in the domain of existential focus quantification is a slight asymmetry of the relationship of *yě* (∃) and *dōu* (∀) on the one hand, and of *jiù* (¬∀) and *cái* (¬∃) on the other. Turn back to (27b) to see the point. Agreement-*yě*, the agreement marker for existential focus quantification, is used even though the focus itself is explicitly marked

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[12] There are at least two focus marking devices that necessarily trigger the use of *jiù*, *zhǐ-yào* 'only-must, if' and *guāng* 'alone (postnominal)'. Either marker has unusual properties, and it seems safe to say that segmental focus marking of negated universal quantification over focus alternatives is heavily dispreferred in Mandarin. For some more discussion, see Hole (2004: 70f, 249–58).

for universal focus quantification by *lián* 'even' (see section 4). In itself, this is not a problem, because universal quantification over a non-empty domain entails existential quantification: If all alternatives are true, then some alternative is true. The asymmetry becomes only evident if we compare these facts with the contrasting case of *cái* ($\neg\exists$) vs. *jiù* ($\neg\forall$). With a preverbal focus explicitly marked as an 'only'-focus, *cái* must be used, but the use of *jiù* is deviant; this is demonstrated in (28).

(28) Lǎo Wáng   zhǐyǒu [chá] cái/*jiù hē.
     Old Wang   only   tea CAI/JIU drink
     'Old Wang drinks only [tea].'

(28) with *jiù* is bad even though 'no contextually relevant alternative proposition is true' entails 'not all contextually relevant alternative propositions are true'. I have nothing conclusive to say about this asymmetry in the system, but one might want to explore the following possibility: perhaps the observed asymmetry stems from the difference between presupposition and entailment in focus semantics. Agreement-*yě* ($\exists$) and agreement-*dōu* ($\forall$) are both triggered by foci that presuppose their respective quantificational types. Agreement-*jiù* ($\neg\forall$) likewise presupposes the information about the alternatives, whereas agreement-*cái* ($\neg\exists$) is the only particle that is triggered by an entailment.[13] If the particles are sensitive to this difference, then it doesn't take us by surprise that *jiù* cannot replace *cái* in (28). The 'only'-marked entailment focus doesn't go together with an agreement particle reserved for presuppositional focus semantics, viz. *jiù*, even if the quantificational types are in principle compatible.

Except for the fact that agreement-*yě* would make our system of four quantificational types complete, we haven't seen any arguments why agreement-*yě* should be considered the background marker of existential quantification over alternatives, and not just a variant of *dōu*, i.e. of the marker for universal quantification over alternatives. And indeed, conclusive evidence is not at all easy to come by. There does not seem to be a simplex ad-focus marker comparable to *zhǐyǒu* 'only' or *lián* 'even' which necessarily triggers the use of agreement-*yě*. Recall that stressed adverbial *yě* 'also' may be used even if its focus precedes it (cf. the discussion that follows ex. (27)), so the need for an additional focus marker is not obvious. Nonetheless, there is indirect evidence that supports the idea that agreement-*yě* is not just a variant of agreement-*dōu*. Turn to (29) for an interesting contrast.[14]

(29) a. Jíshǐ [guówáng lái], wǒ yě/dōu bù qù.
        even.if king   come I YE/DOU not go
        'Even if [the king comes] I won't go.'
     b. Jiùshì [guówáng lái], wǒ yě/#dōu bù qù.
        even.if king   come I YE/DOU not go
        ≈ 'Even if [the king comes] I won't go.'

Both sentences look like ordinary concessive conditionals, but while (29a) is fine with either *dōu* or *yě*, (29b) only tolerates *yě*. The only difference between the two sentences is located in the sentence-initial elements, viz. *jíshǐ* as opposed to *jiùshì*. These elements have a subordinating function, and a focus marking function, and therefore they have been glossed as 'even if'. But, as the approximate equal sign in the translation of (29b) indicates, the two cannot be

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[13] It is like chickening out to put this into a footnote, but I have to assume that in our domain, and at the relevant level of analysis, the difference between assertion/entailment and presupposition does not matter.

[14] Another construction which requires the use of agreement-*yě* to the exclusion of agreement-*dōu* is the Mandarin counterpart of *rather…than*-constructions. The 'rather'-marker *nìng(kě)* is invariably followed by agreement-*yě*. I have not been able to exploit this construction in my argumentation because I lack a semantic account of the Mandarin construction.

fully identical in function, otherwise *dōu* should be just as fine in (29b) as it is in (29a). If we look at the make-up of the subordinating words, we find that the first syllable of *jiùshì* is written with the same character that is also used to write *jiù*, the background marker of ¬∀-type focus semantics (cf. section 5), viz. 就. There are several other subordinating-and-focus-marking particles with an identical function which contain this syllable, for instance *jiùsuàn*, or *jiùràng*. They all require *yě* as a background marker. Even if we can't say that focus marking *jiù-* is the same as background marking *jiù* at a synchronic level, we should try to exploit our knowledge about *jiù*'s quantificational type to elucidate that of *jiùshì*-type subordinators. The simplest assumption would be that *jiùshì*-words are like markers of concessive conditionality, except that they preclude the possibility that all alternatives are true. Other alternatives are true, *but at least one must be false*. The latter would be the common component of focus marking *jiù-* and of background marking *jiù*. A focus marked for this type (∃ & ¬∀) will not be compatible with background marking *dōu* anymore, because *dōu* requires all relevant alternatives to be true. Whether this reasoning can be used to explain the contrast in (29) hinges on at least two factors. One would have to find more evidence to support the claim that a combined focus semantic type like '∃ & ¬∀' may exist, and one would have to explain why, if the assumption of such a type is warranted, *jiù* is never used as a *background* marker following *jiùshì*-type subordinators. In my corpus, at least, this does not occur. Provided these two obstacles could somehow be cleared, then the contrast in (29) would be good evidence in support of the claim that background marking *yě* is correctly characterized as being of type ∃, and that it is not just a variant of *dōu*, which is of type ∀.[15]

7. Mapping focus-background partitionings to tripartite quantificational structures
Let us assess the results of the preceding paragraphs within the overall plan of the paper. The highly systematic core of the conventionalized module of Mandarin focus-background agreement was reviewed, and we had the opportunity to see that the relevant agreement markers *cái*, *jiù*, *dōu* and *yě* follow the information-structurally distinguished constituents that they co-vary with. Their position is fixed; they occur at the left edge of the larger verbal complex of the main predication. This yields the marked focus-background topology in (30a).[16] (30b) is the canonical focus-background topology found with run-of-the-mill cases of adverbial focus marking not only instantiated by the Mandarin focus markers *zhǐ* 'only' or *shènzhì* 'even', but also by adverbial uses of *only* in English.

(30)　a.　The non-canonical focus-background topology triggering background-agreement
$$\left(\begin{smallmatrix}\text{back -}\\\text{ground}\end{smallmatrix}\right)\text{FOCUS}\left(\begin{smallmatrix}\text{back -}\\\text{ground}\end{smallmatrix}\right)+ cái\ /\ jiù\ /\ dōu\ /\ yě + \text{background}$$

　　　b.　The canonical focus-background topology with adverbial focus markers
$$\text{background} + zhǐ\ /\ shènzhì\ /\ ... + \left(\begin{smallmatrix}\text{back -}\\\text{ground}\end{smallmatrix}\right)\text{FOCUS}\left(\begin{smallmatrix}\text{back -}\\\text{ground}\end{smallmatrix}\right)$$

Recall from section 1 that the right-hand backgrounds of (30a) are at least VPs and probably, as Shyu (1995) claims, non-epistemic modal phrases or aspect phrases. As said in section 1 already, this kind of partitioning into focus and background regularly yields focus quantificational structures in which the VP is identified with the background. The opposite is true of the

[15] There is more to be said about the peculiarities of agreement-*yě* than we have space for. A further restriction governing the occurrence of *yě* has most likely to do with veridicality (for the recent putting to use of this concept cf. Giannakidou 1997, 1999). Agreement-*yě*, if used in constructions involving indefinite pronouns as discussed in section 4, is only licensed in non-veridical contexts, i.e. in the scope of a sentence-level operator which does not entail that the embedded proposition is true. Such sentence-level operators are, for instance, possibility modals, or negation. For more details see the aforementioned references, or Hole (2004: 86–9).

[16] The focus-background topology of (30a) glosses over the special case of C-topics triggering the use of *jiù* as discussed in sections 5.3 and 5.4.

canonical focus-background topology in (30b): The VPs following the adverbial focus markers *zhǐ* 'only', *shènzhì* 'even' etc. must contain the focus relating to the adverbial focus markers.

Quite informally, the quantificational aspect of the system of conventionalized background marking in Mandarin can be summarized as in (31).

(31) a. Presupposition of *dōu*-sentences: All alternative propositions are true.
      b. Presupposition of *yě*-sentences: Some alternative proposition is true.
      c. Entailment of *cái*-sentences: No alternative proposition is true.
      d. Presupposition of *jiù*-sentences: Not all alternative propositions are true.

Let us check now how this general architecture of the system of conventionalized background marking in Mandarin relates to ideas about the representation of the semantics of focus particles that are commonly found in the literature. The result of this survey will be that (i) the type of format chosen here allows for the simplest and most coherent statement of the system; (ii) the mapping to tripartite quantificational structures proposed below captures intuitions about focus quantification more accurately than the mapping that is predominantly used in the literature for 'only'-type foci; (iii) alternative semantics à la Rooth (1985), as opposed to structured meanings, allows for a simpler statement of restrictions of sets of alternatives.[17]

7.1 Focus semantics and tripartite structures: some candidate mappings

It is a common assumption that foci are mapped to nuclear scopes in a tripartite structure format of quantification (cf. Partee 1995: 546, 592). But it is not at all clear what this means in detail, and I will try to shed some light on this question in the present section. Let us compare some possible candidates for partitionings of the focus-semantic entailment of a sentence with an 'only'-focus.

(32) Only [Bill] came to the party.
(33) a. $\neg\exists x$ [$x \in$ set of alternatives to Bill] [(x came to the party) is true]
      b. $\neg\exists p$ [$p \in [\![(32)]\!]^f_{C7}$] [p is true][18]
(34) a. $\forall x$ [$x \in$ set of alternatives to Bill & (x came to the party) is true] [x = Bill]
      b. $\forall p$ [$p \in [\![(32)]\!]^f_{C7}$ & p is true] [p = Bill came to the party]
(35) a. $\forall x$ [$x \in$ set of alternatives to Bill & x $\neq$ Bill][(x came to the party) is false]
      b. $\forall p$ [$p \in [\![(32)]\!]^f_{C7}$ & p $\neq$ Bill came to the party] [p is false]

The tripartite structures in (33) through (35) are equivalent ways of stating the focus-related entailment of (32).[19] They vary along the three dimensions in (36).

(36) a. Quantification over alternative focus values vs. quantification over alternative propositions (a-versions vs. b-versions)
      b. Assertion of truth or falsity in the nuclear scope vs. identity statement in the nuclear

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[17] This is not to say that I side with "puristic" versions of Rooth's theory which dispense completely with structured propositions (von Stechow 1982) for the modeling of focus semantics. Since the syntactic repercussions of the focus-semantic phenomena discussed here are so obvious I certainly need a way to oppose focus constituents and background constituents in the syntax, and this anuls the economical advantage that the Roothian *in-situ* interpretation of foci has. Once the foci have moved, we may just as well interpret them where we find them instead of lowering them back to their base positions. Still, spelling out contextually restricted sets of alternatives will turn out simpler if we make recourse to alternative propositional wholes as in the Roothian tradition, and not just to alternative focus values. See the following subsections for discussion.

[18] Cf. fn. 11.

[19] They are only equivalent if the respective sets of alternatives are restricted in a specific way. I will turn to this issue in a moment.

scope ((33)/(35) vs. (34))
c. Negated existential quantification vs. universal quantification ((33) vs. (34)/(35))

(33a) amounts to Horn's (1969) analysis of *only*-entailments, except that (33a) makes use of the tripartite structure format of quantification instead of relying on Horn's propositional logic formula. Inasmuch as the focus is opposed to the background and quantification is over alternatives to the focus value only, (33a) is a representation in the structured-propositions tradition for the treatment of focus syntax and semantics (von Stechow 1982). (33b) is a format which makes reference to complete propositions instead of focus values only. In this respect (33b) is in the tradition of Rooth (1985). This format is never chosen in mainstream formal semantics, but it will be the kind of format that I will favor at the end of this discussion. The contrast between quantification over alternatives to the focus value as opposed to quantification over alternative propositions recurs in the other pairs in (34) and (35), but now the universal quantifier is used to express the entailment of *only*. (34a/b) and variants thereof are the kinds of partitionings that are typically found in formal accounts of the meaning of *only* (cf. Rooth 1985, Kratzer 1991b, Büring & Hartmann 2001 among many others). The versions in (35) are like those in (33), except that outer negation plus existential quantification has been replaced by universal quantification and inner negation. (35a) amounts to the (didactic) proposal in Heim & Kratzer (1997: 257).

7.2 Sorting out nuclear scopes with identity statements
It is not fully clear to me why typically some version of (34), that is one with a universal quantifier and an identity statement in the nuclear scope, is used to express the 'only'-entailment. I can make two guesses, though. The first one has to do with the fact that in (34a) the focus value occurs in the nuclear scope, and that seems to coincide with the idea mentioned at the beginning of this section, namely that the focus should be mapped to the nuclear scope. My second guess concerns a general inclination towards the "preferred quantifier in formalizations". Whenever possible, formal semanticists will use the universal quantifier, because it has such a fundamental role in formal semantics, especially in comparison with negated existential quantification. What strikes me as flawed in representations like (34a/b), though, is the fact that the 'only'-entailment should intuitively be a statement about the truth or falsity of alternatives (as in (33) or (35)), and not about identity (as in (34)). This intuition is also reflected in the widespread formulation that focusing is about 'evoking and considering alternatives'. With 'only'-words, which combine focus semantics with a truth-conditional import, 'considering alternatives' must be sharpened to 'evaluating the truth of alternatives'. This is done in the nuclear scopes of (33) or (35), but not in (34). If (34) is sorted out on these grounds, what becomes of the idea that 'foci should be mapped to the nuclear scope'? I think that this wording is insufficiently clear, and even metaphorical. It is unimportant where in the tripartite structure the focus value is *mentioned* (if it is mentioned at all); what matters is where the assertive import of 'only'-focusing is spelled out. Seen from this perspective, the way the intuitively important component of 'considering the truth of alternatives' is hidden in the restrictor in (34) becomes questionable. As a result of this discussion I will assume that (33) and (35), repeated here as (37) and (38), remain as candidates for a reasonable mapping of 'only'-entailments to tripartite structures.

(37) a. $\neg\exists x$ [x $\in$ set of alternatives to Bill] [(x came to the party) is true]
      b. $\neg\exists p$ [p $\in$ $[\![(32)]\!]^f_{C7}$] [p is true]
(38) a. $\forall x$ [x $\in$ set of alternatives to Bill & x $\neq$ Bill][(x came to the party) is false]
      b. $\forall p$ [p $\in$ $[\![(32)]\!]^f_{C7}$ & p $\neq$ Bill came to the party] [p is false]

I will defer the discussion of the necessary restriction of the set of alternatives for another moment and deal with the contrast between universal and negated existential quantification between (37) and (38) first.

7.3 Sorting out universal quantification

As stated above, the differences between (37) and (38) are inert both in terms of truth-conditions, and in terms of the partitioning into restrictor and nuclear scope. But if we look at the different options in the context of conventionalized background marking in Mandarin, a preference for structures as in (37) emerges. Recall that *dōu* as a background marker is triggered by strong NPIs, 'even'-foci, and some other categories. The quantificational type was identified as universal in section 3 ('all alternatives are true'). If we take this to be natural and uncontroversial, and if we want to keep the differences in our expression format for the relevant focus semantics restricted to the quantifiers (and this appears to be desirable), then the simplest assumption is to oppose the (simplified) quantificational statements in (39), and not the ones in (40).

(39) a. All alternatives are true.
    b. No alternative is true.
(40) a. All alternatives are true.
    b. All alternatives are false.

Independent evidence to support the idea that universal quantification resides in the *dōu*-corner of the system comes from the polysemy of background marking *dōu*. As mentioned in fn. 7, the primary use of *dōu* is as a distributivity operator. This makes the assumption of a semantics involving universal quantification for the homophonous background marker plausible. Taking together *dōu*'s claim to universal quantification, and the wish to keep changes in the quantificational format restricted to the quantifier, the only candidate for operatorhood in 'only'-assertions is negated existential quantification ($\neg\exists$).

7.4 The preference for quantification over p-sets

The reasoning so far leaves us with the two candidates in (33)/(37), repeated here as (41). (41a) quantifies over alternatives to the focus value, and (41b) over alternative propositions that only differ in the position of the focus value.

(41) a. $\neg\exists x$ [x $\in$ set of alternatives to Bill] [(x came to the party) is true]
    b. $\neg\exists p$ [p $\in$ $[\![(32)]\!]^f_{C7}$] [p is true]

The problem with tripartite structures as in (41a) is that they require special machinery to deal with scale reversals. Take the sentences in (42)/(43) and their respective 'only'-entailments as an example. (Both (42b) and (43b) are quantificational structures with quantification over alternatives to the focus value as in (41a).)

(42) a. Little Wang ate only [three]$_F$ apples.
    b. $\neg\exists x$ [x $\in$ {1, 2, 3, …}] [(Little Wang ate x apples) is true]
(43) a. Only if Little Wang ate [three]$_F$ apples did he have enough.
    b. $\neg\exists x$ [x $\in$ {1, 2, 3, …}] [(if Little Wang ate x apples he had enough) is true]

Even though the focus of *only* and the material preceding the focus are identical in both sentences, the exclusion of alternatives goes in different directions, but this is not stated in (42b) and (43b). Stated in terms of alternatives to the focus value, *only* in (42a) excludes values higher than 'three', and lower values are irrelevant; *only* in (43a), on the other hand, excludes

values lower than 'three', and higher values are irrelevant. This information is not included in the tripartite structures, because by just quantifying over alternatives to the focus value, this kind of information is not accessible without further amendments. To be sure, the observed reversal of relevant alternative values is a consequence of the monotonicity behavior of numbers in different portions of a proposition. But if *only* just quantifies over the alternatives to the focus value, i.e. if the domain restriction doesn't make reference to the monotonicity facts, then quantification will often be over undesirable alternatives. Such a consequence could be avoided if every focused (or focusable) constituent were annotated for its monotonicity properties (see Dowty 1994 for such an implementation). I think we should aim at a more parsimonious solution, though.[20] If we choose representations that make reference to propositions in the restrictors, the sorting out of irrelevant alternatives can be achieved without any costly amendments. We only need to say that quantification may not be over trivial alternatives. If, by putting our 'only'-semantics to work, we excluded alternatives that are trivially true, then a contradiction would be the result. Look at our examples again, now with quantification over propositions.

(44) a. Little Wang ate only [three]$_F$ apples.
      b. $\neg\exists p$ [p $\in$ $[\![(44a)]\!]^f_{C4}$] [p is true]
(45) a. Only if Little Wang ate [three]$_F$ apples did he have enough.
      b. $\neg\exists p$ [p $\in$ $[\![(45a)]\!]^f_{C4}$] [p is true]

At first blush, the same problem as in (42)/(43) seems to arise. For instance, the focus meaning or p-set for (44a) as generated by Rooth's mechanism will contain the proposition 'Little Wang ate two apples'. It is a type-identical alternative which differs from the proposition only at the position of the focused constituent. According to (44b) it must be wrong. But since it is entailed by *Little Wang ate three apples*, it cannot be false. What looks like a problem is already the way out. Such alternatives can be sorted out by a general mechanism before quantification applies. All members of the p-set which are entailed by the proposition with the focus value, i.e. with numbers between 'one' and 'three' in (44a), are sorted out right from the beginning. Like this, the p-set will only contain realistic alternatives. From now on I will annotate realistic focus meanings or p-sets with an *R*-subscript in addition to the context index. We thus get the realistic p-set in (46a) for (44), and the realistic p-set in (47a) for (45). The modified quantificational structures for the 'only'-entailments are provided in the b-lines.

(46) a. $[\![(44a)]\!]^f_{R,\,C4}$ = {*L.W. ate four apples*, *L.W. ate five apples*, *L.W. ate six apples*, ...}
      b. $\neg\exists p$ [p $\in$ $[\![(44a)]\!]^f_R$] [p is true]
(47) a. $[\![(45a)]\!]^f_{R,\,C4}$ = {*Only if L.W. ate one apple did he have enough*, *Only if L.W. ate two apples did he have enough*}
      b. $\neg\exists p$ [p $\in$ $[\![(45a)]\!]^f_{R,\,C4}$] [p is true]

7.5 Realistic p-sets for the other focus semantic types

Reasonings like the one for the realistic p-set restriction of 'only'-foci are necessary for the other types of foci, too. The reasoning for 'also'-type quantification, that is, existential quantification over alternatives, is similar. With 'also'-type quantification over alternative propositions, only propositions that may possibly be presupposed may be in the domain of quantification. Propositions that are entailed by the assertion are not presupposed, and they may not be, so they must be sorted out from the p-set before quantification applies. Put differently, sorting out entailments makes sure that the alternative presupposed as true by 'also'-type focusing is not one that is entailed to be true, anyway, while all other alternatives may happen to be false.

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[20] Cf. Jacobs (1983) or Löbner (1990) for related discussions.

This makes sure, for instance, that 'also'-type quantification doesn't have a proposition like 'He ate a kind of vegetable' in its domain when the assertion is 'He ate (also) carrots' (note the deviance of #*He ate a kind of vegetables, and he also ate carrots*). Again, trivial alternatives are excluded from the domain of quantification to arrive at realistic p-sets or focus meanings.

The reasoning for negated universal quantification ($\neg\forall$) is the mirror-image of the reasoning for existential and negated existential quantification, and it has already been developed in the context of custom-tailoring the analysis of *jiù*-foci so that it could be applied to contrastive topics in Mandarin (cf. section 4.5). The point there was that the p-set may not contain propositions which contradict the proposition with the C-topic value (and the focus value). At least one alternative must be false in *jiù*-sentences, but this false alternative may not be one that *must* be false by way of an entailment of the asserted proposition. It must be an alternative that is false independently of the proposition in the assertion. With $\neg\forall$-type focus quantification, the formation of realistic p-sets will, thus, mean that contradictions of the assertion are excluded from the p-set. An analogous reasoning is valid for $\forall$-type focus quantification. The p-set may not contain propositions that contradict the assertion. If it did, it couldn't be the case that all alternatives are true. Table 2 assembles the facts of realistic p-set formation for our domain.

quantifier	excluded from the domain/the realistic p-set are propositions that …	reasoning	the proposition with the focus value ends up …
$\neg\exists$	… are entailed by the proposition with the focus value	including the entailed propositions would result in a contradiction	… outside the domain/the realistic p-set
$\exists$		including the entailed propositions would lead to quantification over trivial alternatives	
$\neg\forall$	… contradict the proposition with the focus/CT value	including the contradicting propositions would lead to quantification over alternatives that are trivially false	… inside the domain/the realistic p-set
$\forall$		including contradicting propositions would lead to incompatibility with the quantificational type	

Table 2: Formation of realistic p-sets for different quantificational types

The restrictions on the quantifier domains/the p-sets that are summarized in Table 2 constitute a kind of amendment to the restrictions that affect p-sets as a consequence of contextual information. A pure p-set is just the set containing all type-identical alternatives that only differ from the original proposition in the position of the focus. This set is restricted by contextual information, which is typically modeled by way of a (silent) context anaphor in the syntax (cf. von Fintel 1994). The kind of restriction dealt with here cannot be of this contextual kind because it varies with the kind of semantic focus type. It must either be written into the semantics of the focus particles, or, and this seems more plausible, it follows from general assumptions about the informativity and non-contradictoriness of utterances. Only if we assume the above restrictions on realistic p-sets will utterances with focus particles be informative and non-contradictory. A side effect of this general mechanism is highlighted in the third column of Table 2. The proposition with the focus value is part of the realistic p-set only with $\neg\forall$-type focusing (*jiù*) and $\forall$-type focusing (*dōu*). This gets us the problem out of the way that is obvious with non-manipulated p-sets. If a p-set of a sentence with an 'only'-word has as one

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of its members the proposition with the focus value, then this proposition will lead to a contradiction with $\neg\exists$-type focusing. The realistic p-sets assumed here pose no such problem. The complete set of tripartite structures for our four focus-semantic types is given in (48).

(48) *cái*-sentences: $\neg\exists p \ [p \in \text{p-set}_{R,\,Ci}] \ [p \text{ is true}]$
     jiù-sentences: $\neg\forall p \ [p \in \text{p-set}_{R,\,Ci}] \ [p \text{ is true}]$
     dōu-sentences: $\forall p \ [p \in \text{p-set}_{R,\,Ci}] \ [p \text{ is true}]$
     yě-sentences: $\exists p \ [p \in \text{p-set}_{R,\,Ci}] \ [p \text{ is true}]$

Inasmuch as the p-sets are functions of backgrounds, our model makes sure that backgrounds are mapped to the restrictor. Inasmuch as focusing can be reduced to considering the truth of alternative propositions, the nuclear scopes correspond to the focussing function.
If we abstract away from the individual operators in (48), we arrive at a generalized format as in (49).

(49) $\lambda Q p \ [p \in \text{p-set}_{R,\,Ci}] \ [p \text{ is true}]$

(49) is a one-place predicate which takes a quantifier as its argument and delivers a truth value. This way of representing focus quantification sheds an interesting light on the perennial controversy whether focus 'presuppositions' are existential presuppositions. The debate centers around the question whether a proposition with a focus presupposes that the background predicate is true of something. Geurts & van der Sandt (to appear) have recently defended this claim again, and Büring (to appear) or Schwarzschild (to appear) have, just as recently, rejected it once more. Against the background of our discussion we might tentatively assume that focus-background structures do not, by themselves, carry the existential presupposition. Structures of the type in (49) could then be subjected to existential closure at the discourse level if no other quantifier has saturated the predicate before that.[21]
This concludes the description and analysis of the plain Mandarin system of focus-background agreement. Before we enter into the discussion of its interaction with modality, the main results so far may be summarized as follows:

(i)   There is a single quantificational format to cover the four focus-semantic types of Mandarin that trigger focus-background agreement and that were reviewed in sections 3–6;

(ii)   Quantifying over realistically restricted alternative propositions/focus meanings/p-sets is implemented more easily than quantifying over sets of alternatives to focus values;

(iii)   The VP material that follows the background markers *cái, jiù, dōu* and *yě* (co-)defines the p-set;

(iv)   Since the p-set plays its role in restricting focus quantification, and since p-sets are (co-)defined by VP material in the constructions at hand, VPs are consistently mapped to restrictors in sentences with *cái, jiù, dōu* and *yě*;

(v)   (iv) is in direct contrast with Diesing's (1992) Mapping Hypothesis, according to which VP material is mapped to the nuclear scope;

(vi)   Nuclear scopes of sentences with focus particles assess the truth of realistic alternative propositions.

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[21] This idea is, of course, inspired by Heim's (1982) existential closure rule which is argued by her to be active in the interpretation of indefinites.

8. Non-canonical structures II: Main clause modal *ad-hoc* restrictors

In a somewhat simplified way, the focus-background structures of the preceding sections may be depicted hierarchically as in (50).

(50) Syntactic mapping of focus-background agreement structures in Mandarin

RESTRICTOR
cái/jiù/dōu/yě + (matrix) VP

OPERATOR   NUCLEAR SCOPE
focus marker   focus
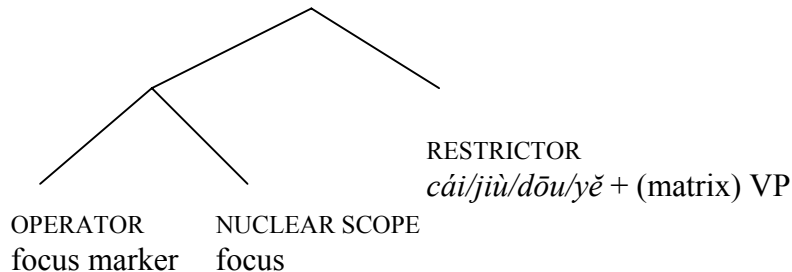
The parenthesized reference to *matrix* VPs in (50) is supposed to remind us of the fact that focus-background agreement also occurs in complex sentences. (51) (=(13a)) is such a complex sentence.

(51) Zhǐyǒu [Lǎo Wáng   lái], wǒ cái qù.
    only.if old Wang   come I   CAI go
    'Only if [Old Wang comes] will I go.'

The focus of (51) is (in) the subordinate clause, the focus marker is likewise in the subordinate clause, and the focus-background agreement marker is a constituent of the matrix clause, which contains (the largest portion of) the restrictor material. Provided one has a compositional solution for the semantics of 'only-if'-clauses, (51) does not pose any further problems (for the requisite discussion of conditionality and 'only-if'-clauses (in Mandarin) see, among many others, von Fintel 1994, 1997 or Hole 2004: 129–38 and the references cited there).

8.1 The problem

The more interesting case, and the one in which modality enters the scene, is exemplified in (52). It, too, was discussed in section 1 in a preliminary fashion. (See the appendix for some more attested examples of this construction.)

(52) [Lǎo Wáng   bìxū qù dàshǐguǎn], cái néng shēnqǐng qiānzhèng.
    Old Wang   must go.to embassy CAI can apply.for visa
    'Only if [Old Wang goes to the embassy] can he apply for a visa.'/
    '[Old Wang must go to the embassy] to be able to apply for a visa.'

The descriptive problem with (52) was as follows: if we translate the sentence as an 'only-if'-conditional, the modal of necessity in the first clause is in the way ('Only if he (#must) go(es) to the embassy can he apply for a visa'); if we treat the first clause as superordinate (this is done in the second translation of (52)), we're ignoring the syntactic structure, which undoubtedly embeds the first clause within the second. Regarding the matter of subordination I put the suspicious reader off till the present section (cf. section 1). (53), finally, presents a sentence that provides strong evidence that the first clause in structures like (52) is syntactically subordinate.

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(53) Tā   bìxū [xià yǔ] cái lái   ma? (Eifring 1995: 223)
      (s)he must fall rain CAI come Q
      'Does (s)he come only if [it rains]?'/'Does it have to [rain] for her/him to come?'

The two translations of this sentence again reflect the two possibilities of relative subordination in English depending on whether an *only-if*-construction (without a modal) is chosen, or a purposive construction. The crucial feature of (53) is its sentence-final question marker *ma*. It marks the whole utterance as a yes/no-question. The question marker *ma* takes widest scope, and it always forms a constituent with the highest proposition in the syntactic structure. If this is so, we can be sure that *cái*-sentences as in (52) and (53) with the problematic modals have basically the same syntactic structure as the usual 'only-if'-sentences exemplified by (51). The highest proposition in (53) must thus be the whole utterance minus *ma*, with the additional embedded proposition *bìxū xià yǔ* 'must fall rain'. Since I know of no syntactic phenomenon that would show *ma* and *bìxū xià yǔ* to be an underlying constituent, I will take it for granted that the main clause analysis for the predicates following *cái* holds in general.
There is a second piece of evidence to corroborate the assumption of a subordinate status of the clause with the modal. Sometimes such clauses contain uncontroversial subordinators, and this kind of example is not at all hard to find. (54) is such an example (adapted from rp: 26).

(54) *Yào   děng [nǐ jiāo-le jièshàofèi] yǐhòu, wǒ cái kěyǐ gěi nǐ   ānpái.*
      necessary PRT   you pay-ASP commission after   I CAI can for you arrange
      'We have to wait until [you have paid the commission] before I can arrange things for you.'/'Only after [you have paid the commission] can I arrange things for you.'

The indicators of subordination in this complex sentence are *děng...yǐhòu* 'after'. There's a slight complication in that *děng*, in its basic use, is a verb with the meaning 'wait'. But if it co-occurs with the clause-final subordinator *yǐhòu* 'after' (and not only then), it is commonly analyzed as partaking in the temporal subordination signaled by *yǐhòu* 'after' (cf. Eifring 1995: 180, 375). Unless one assumes a polysemy for *yǐhòu* 'after', with one variant occurring in subordinate clauses, and the other one occurring in main clauses as a main clause complementizer, examples such as (54) force us to acknowledge the embedded status of the first clause in such sentences.
(55) summarizes the dilemma once more (*NEC* stands for the necessity operator).

(55) a. sentential make-up: [[NEC p] *cái* q]
      b. translation into English: [NEC[p [*in order for* q *to come about*]]]
                                       or: *only* ~~NEC~~ *if* p, *then* q

8.2 Two preliminary attempts at a solution
In Hole (2004: 251–253) I discuss three possible methods of getting a handle on the apparent mismatch of syntax and semantics in (52) through (54), but I dismiss them in favor of a fourth solution. Here's a short review of those two analytical options among the three disfavored options that appear most realistic.

(i) Implicit anaphora
One might assume that the structure that is interpreted is not as in (55a), but as in (56). The phonetically empty material that would have to be postulated is enclosed in curly brackets.

(56) NEC p {and [(*only*) *if* PRON$_p$} *cái* q]

In (56), the modalized proposition is not subordinated any longer. Instead, it is conjoined with a conditional construction such that the interpretation of the proposition under the necessity operator determines the interpretation of the propositional pronominal in the protasis of the conditional construction. A sentence like (52) may then be rendered as 'Old Wang must go to the embassy, and (only) if he goes to the embassy can he/he can apply for a visa'. An analysis along such lines receives some support from a pattern found in English and other languages.

(57)   You have to practice, only then can you win.

In (57), *then* is anaphorically related to *you practice*, and not to *you have to practice*. So it appears in principle possible for a propositional pronominal to have its reference anaphorically determined by a proposition which is embedded under a modal in the preceding clause.

I think that such an analysis, if worked out in detail, would be the only serious competitor to the analysis to be proposed below. An obvious obstacle that would have to be cleared is the fact that the supposedly implicit material in the Chinese construction could not easily be analyzed as a single constituent. Instead, a sequence of a conjoining element, an '(only-)if'-clause marker, and the pronominal PRON$_p$ would each have to be phonetically empty for their own reasons (the '(only-)if'-clause of (56) would form a constituent with '*cái* q' in (56), and not with the conjunction). As I said, such an analysis may be feasible, but I want to try and convince the reader that something else fits more neatly into the larger picture.

(ii) Recategorization: NEC > COMP

The second possibility that we will consider for a moment would be to say that the modal of necessity has been recategorized as a complementizer. This idea, too, has some initial appeal to it, because this is precisely how the uncontroversial complementizer *yàoshi* 'if' has emerged. *Yào* is a modal verb (its synchronic meaning is 'must, want', and *shi/shì* is a copula. There are two strong arguments against the idea that the modals of necessity in our construction are really complementizers. The first one is pretheoretical, but very strong for native speakers. *Bìxū* 'must' and *yào* 'necessary, must' as in (52), (53) or (54) are felt to be modal verbs, and not conjunctions. There is no doubt about this. A more theoretical argument is based on improbability. If we were to distinguish modal verbs from homophonous complementizers, we would be confronted with a highly unlikely coincidence. All the necessity modals used nowadays would have given rise to homophonous complementizers at a point in the past when the set of modal verbs and their functions were still different from the ones we find today. In view of the great time depth that the general pattern under scrutiny here has, this would be extremely implausible (cf. Eifring 1995: 254–57). What appears more plausible is to say that the pattern of subordination represented schematically in (55) has been a constant pattern for more than a millenium, and whatever were the current modals of necessity at a given point in time could be used in this pattern.

8.3 The solution favored here: Main clauses as modal *ad-hoc* restrictors

Recall the simple English example and its tripartite structure representation from section 1 above, which are repeated here as (58).

(58)   a. Old Wang must go to the embassy.
       b. ∀w [w is a world maximally similar to the ideal worlds in terms of the ordering source at hand, say, worlds in which things only happen the way required by the regulations for the issuing of visas]$_{\text{RESTRICTOR}}$ [Old Wang goes to the embassy in w]$_{\text{NUCLEAR SCOPE}}$
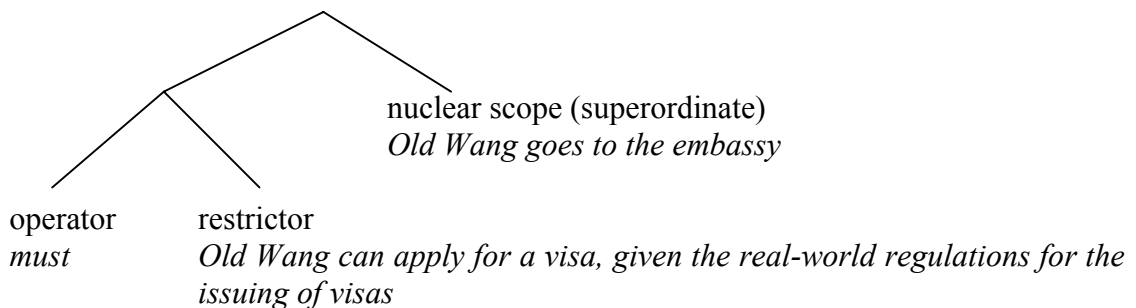
The tripartite structure in (58b) contains a universal quantifier which ranges over possible worlds. This universal quantifier may be identified with the modal verb *must* in (58a). The

remainder of the overt material of (58a) is mapped to the nuclear scope of (58b). The nuclear scope may be identified with the set of possible worlds in which Old Wang goes to the embassy. All the overt material of (58a) has thus been mapped to some component of the tripartite structure. But universal quantification is modeled as a relationship of (set) inclusion – recall from above that *Every boy eats chocolate* may be modeled as the inclusion of the set of boys in the set of people who eat chocolate. We will therefore have to say that the context has to furnish us with a subset of the worlds which define the nuclear scope, and such a set of worlds is characterized in the restrictor of (58b). Accounts in the spirit of Kratzer (1981, 1991a) will grant constituent status to this restrictor material, i.e. Kratzer's ordering source.[22] And indeed, contextually relevant material can be made explicit in *if*-clauses, in purpose clauses and with other means. (59) gives two such options for suitably contextualized specific examples. (*S*-subscripts mark the nuclear scope, the *R*-subscript marks the restrictor.)[23]

(59) a. If [Old Wang wants to be able to apply for a visa, and given the regulations for the issuing of visas]$_R$, [he]$_S$ must [go to the embassy]$_S$.
      b. [Old Wang]$_S$ must [go to the embassy]$_S$ to [be able to apply for a visa, given the regulations for the issuing of visas]$_R$.

Compositional analyses of such examples typically make use of an LF structure with the overall constituency in (60) (cf., for instance, von Fintel & Iatridou 2004; linearization is irrelevant in (60).) The complication of having *wants* in (59a) in addition to *to* as opposed to plain purposive *to* in (59b) is likewise ignored.)

(60)

nuclear scope (superordinate)
Old Wang goes to the embassy

operator   restrictor
must   *Old Wang can apply for a visa, given the real-world regulations for the issuing of visas*

A (heavily simplified) lexical entry for *must* to yield the desired interpretation is given in (61).

(61) $[\![must]\!] = \lambda R \lambda S.R \subseteq S$

R in (61) is the variable ranging over sets of restrictor worlds, and *S* is the variable ranging over sets of nuclear scope worlds. If we plug in the sets of worlds defined by the restrictor material and the nuclear scope material in (60), respectively, we arrive at the truth condition in (62). (From now on I sometimes abbreviate the ordering source formerly referred to as 'given the real-world regulations for the issuing of visas' as 'gvr' for 'given the visa regulations'.)

(62) {w: Old Wang can apply for a visa, gvr, in w} $\subseteq$ {w′: Old Wang goes to the embassy in w′}

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[22] I'm disregarding the second component of the restrictor material in Kratzer's system, viz. the modal base which sets apart epistemic modalization from circumstantial/non-epistemic modalization. All the data discussed in this paper involves circumstantial modal bases.
[23] Information-structure is ignored in the present section, but I will plug it in again in section 8.4.

The simple idea for the problematic Mandarin data, which are again exemplified in (63) by our old example, is to say, (i), that modals in these sentences take their arguments in the reverse order if compared with standard modalized sentences and, (ii), that the node dominating the modal and the nuclear scope is syntactically subordinate, whereas the restrictor is syntactically superordinate.

(63) [Lăo Wáng <u>bìxū</u> qù dàshĭguăn], cái néng shēnqĭng qiānzhèng.
 Old Wang must go.to embassy CAI can apply.for visa
 'Only if [Old Wang goes to the embassy] can he apply for a visa.'/
 '[Old Wang <u>must</u> go to the embassy] to be able to apply for a visa.'

(64) $[\![b\grave{\imath} x\bar{u}_{\text{rev}}, y\grave{a} o_{\text{rev}}, d\check{e} i_{\text{rev}}, \ldots]\!] = \lambda S \lambda R.R \subseteq S$

(64) provides us with a lexical entry for such "reverse" modals of necessity. The differences between the individual modals in (64) don't matter at this level of generality, as long as the modals are necessity modals. Point (i) from above (reverse order of the arguments) does not seem to pose any insurmountable problems given that tripartite structures, just by themselves, don't have a binary constituency (cf. below and Partee 1995). Still, a word about conservativity may be in order. If we require all natural language quantifiers (and not just all determiners) to be conservative, there may be a problem with the lexical entry in (64). Conservativity is defined for run-of-the-mill determiners like *all* as in (65a).

(65) a. A determiner D is conservative iff $D(A)(B) \leftrightarrow D(A)(A \cap B)$, with A and B the sets corresponding to the first and the second argument of the determiner, respectively
 b. All boys eat chocolate. $\leftrightarrow$ All boys are boys that eat chocolate.

And indeed, the sentences in (65b) are equivalent (if the context for both sentences is kept constant). If we apply the definition of conservativity in (65) in a suitably generalized form to our example in (63) such that it also covers modal quantifiers, and if we adopt the lexical entry for *bìxū* 'must' in (64), we don't get an equivalence.

(66) $b\grave{\imath} x\bar{u}_{\text{rev}}(\{\text{w}' : \text{O.W. goes to the emb. in w}'\})(\{\text{w: O.W. can apply f. a v., gvr, in w}\})$
 $\leftrightarrow^?$
 $b\grave{\imath} x\bar{u}(\{\text{w}' : \text{O.W. goes to the emb. in w}'\})(\{\text{w}' : \text{O.W. goes to the emb. in w}'\} \cap \{\text{w: O.W. can apply f. a v., gvr, in w}\})$

If the equivalence of (66) were to hold, the following paraphrase of (66) would have to be true: 'All the worlds in which Old Wang goes to the embassy are worlds in which he goes to the embassy and can apply for a visa'. This is false, because if Old Wang goes to the embassy, but doesn't bring his passport along, he won't be able to apply for a visa. I think there's a simple remedy to this problem. Note that the definition of conservativity in (65) makes recourse to the order of functional application (*A* before *B*), and this is reflected in the parlance of 'the first argument of a quantifier' and 'the second argument of a quantifier'. What this parlance tacitly implies is that the first argument represents the restrictor, and the second one the nuclear scope, because that's the way all the ordinary D-quantifiers work. A revised definition of conservativity for quantifiers in general which would not make recourse to this unclear terminology might then look as in (67).

(67) A quantifier *Q* is conservative if $Q(R)(S) \leftrightarrow Q(R)(R \cap S)$
  or if $Q(S)(R) \leftrightarrow Q(R \cap S)(R)$;
  else *Q* is non-conservative.

Thus, even if we extend the conservativity requirement from determiners to quantifiers in general, the proposed lexical entry in (64) is a plausible candidate, and the reversal of the arguments does not lead to any problems as long as we understand the order of argument taking as epiphenomenal.

The second ingredient of the proposal made above for the special Chinese modals under scrutiny here has been to say that the operator and the nuclear scope are syntactically *subordinate*, while the restrictor is syntactically *superordinate*. The first thing to remember in this context is that precisely the same situation holds for the structures of plain, i.e. non-modal, focus-background agreement discussed above (cf. (50)). The problem was just not so obvious, because I didn't provide lexical entries for focus quantifiers that specify the order of argument taking. Moreover, the possibility of finding structures like this has been discussed in the literature, and it turns out that we seem to have found something in the data that has already been postulated on theoretical grounds, and as a consequence of linguistic imaginativeness of a high degree. Here is a first relevant tentative statement made by Partee which concerns the possibility of finding tripartite structures of our exotic kind.

'[…] it seems that […] no language has overtly subordinate structures in which it is the nuclear scope that is expressed by a subordinate clause, while the restrictor is expressed as the main clause.' (Partee 1995: 571)

This statement seems to deny the existence of structures as I propose them here, but Partee makes this statement only with respect to structures in which *the operator is always implicit*. This is not the case in our sentences, because the modal is explicit in the structure. The more interesting passage is from the concluding section. I chose a relatively long quote to preserve the special groping style of Partee's impressive paper.

'My intuition is that one family of structures is basically operator-headed and its variants can be appropriately grouped together under the original tripartite structure [i.e. one where the operator is in some sense "closer" to the restrictor than to the nuclear scope; D.H.]; binary branching variants would be those representable without changing the order of the three parts [i.e. operator, restrictor, nuclear scope; D.H.]. (Order then represents potential subgroupability.) I tend to think there is another family of structures […], but I am less clear about how to describe it. What I would like to see is a way to articulate distinct notions of "pragmatically prior" and "semantically prior" so as to be able to say that the restrictor (at least in some structures) is contextually superordinate and "prior" to both the operator and the nuclear scope even if it is itself also semantically bound by the operator and "background" and/or syntactically subordinated.' (Partee 1995: 593)

Let us disregard the fact that the proposed Chinese main clause restrictors *follow* the rest of the quantificational structures and are, therefore, not "prior" in every conceivable sense. In every other respect our sentences in (52) through (54) are, under the analysis presented for them here, perfect instantiations of what Partee had in mind. The restrictor is "prior" because it delivers the matrix structure in which the operator and the nuclear scope are embedded. In the above quote, Partee makes a provision to defend her intuition of subordination against what she thinks is more realistic syntactically ('[…] the restrictor […] is contextually superordinate […] even if it is itself […] syntactically subordinated'). This proviso is unnecessary in our context. The restrictor is not just "contextually prior" or "superordinate", but also in a plain syntactic sense. The restrictor is, moreover, also "prior" in a second sense. It must, as a whole, be (part of) the background of the focus inside the subordinate nuclear scope

clause. This concerns the information-structural side of our construction, and we will turn to its specific interplay with modality in the following section.

8.4 The interplay of modality and information-structure

What I would like to show in this section is that the truth-conditional contribution of the modal structure that we discussed above is identical to the truth-conditional contribution of the focus quantificational structure that goes along with the modal structure. This may sound too prolific to pass the test of parsimoniousness, but I claim that the special construction with main clause modal restrictors is really characterized by this redundancy.

In order not to get lost in the argumentation, let us start by reconstructing the modal reasoning from above in diagrammatical terms.

Figure 1 is a representation of the sets of possible worlds that are relevant for the truth-conditions of our paradigm example, repeated here as (68a), with its truth-conditions in (68b/c). (68b) is the more explicit format from (62), (68c) is a tripartite structure saying precisely the same thing. Recall that *gvr* stands for 'given the visa regulations' or 'given the regulations for the issuing of visas'.

(68) a. [Lǎo Wáng   bìxū qù dàshǐguǎn], cái néng shēnqǐng qiānzhèng.
        Old Wang   must go.to embassy   CAI can   apply.for   visa
        'Only if [Old Wang goes to the embassy] can he apply for a visa.'/
        '[Old Wang must go to the embassy] to be able to apply for a visa.'
     b. {w: O.W. can apply for a visa, gvr, in w} ⊆ {w′: O.W. goes to the embassy in w′}
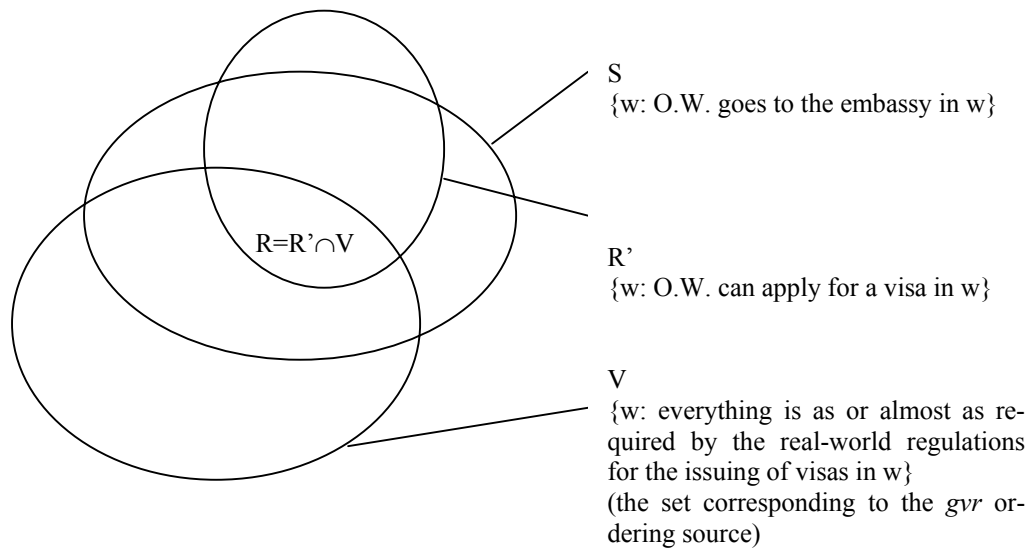   c. ∀w [O.W. can apply for a visa, gvr, in w] [O.W. goes to the embassy in w]

Figure 1: Sets of possible worlds relevant to the interpretation of (68a)

The intersection of R' and V (R'∩V) in Figure 1 yields the restrictor set R corresponding to the sets of worlds on the left sides of (68b/c). If we redraw the diagram just with the immediately relevant sets R and S, we arrive at the simple set inclusion of Figure 2.
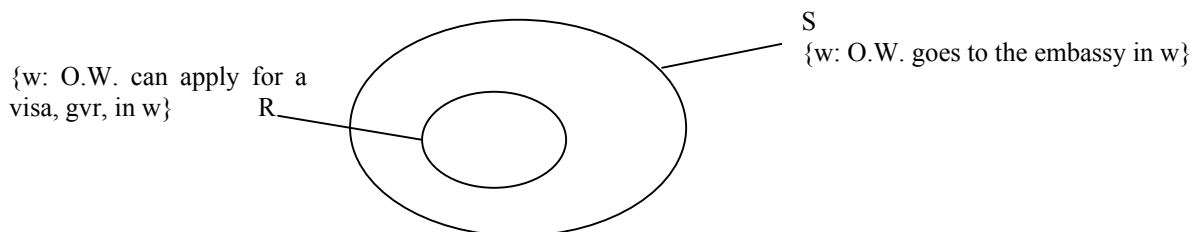
Figure 2: Sets of possible worlds relevant to the interpretation of (68a) (reduced version)

This is precisely what we need: a simple set inclusion as required by the truth-conditions of necessity.
Let us now turn to the information-structural side of the sentence. The sentence is once more repeated in (69a), and its focus-semantic entailment is provided in (69b).

(69) a. [Lǎo Wáng   bìxū qù   dàshǐguǎn],cái néng shēnqǐng qiānzhèng.
        Old Wang   must go.to embassy CAI can apply.for   visa
        'Only if [Old Wang goes to the embassy] can he apply for a visa.'/
        '[Old Wang <u>must</u> go to the embassy] to be able to apply for a visa.'
     b. $\neg\exists p\ [p\in [\![(69a)]\!]^{f}_{R,\,C8}]\ [p$ is true$]$

To arrive at the realistic p-set or focus meaning of (69a) in (69b), we must determine that portion of (69a) that may vary from one proposition to the other in the p-set. Put differently, we must determine the largest possible focus of (69a). I have bracketed the largest focusable constituents in the examples throughout the paper. Remember that material following the background marker *cái* may not be in focus. With the specific construction at hand, the largest possible focus is discontinuous at the surface. Given discourse conditions that don't involve a corrective focus or a repair intonation, the necessity modal may not bear a focus accent, and it may not be in focus. The whole nuclear scope proposition in its scope may, however, be focused, including *Lǎo Wáng* 'Old Wang'. Assuming again that realistic p-sets of 'only'-foci exclude the proposition with the focus value (cf. sections 7.4/7.5), all members of the realistic p-set must be compatible with 'It is not the case that Old Wang must go to the embassy to be able to apply for a visa, given the regulations for the issuing of visas' with the presupposition 'Something must be done for Old Wang to be able to apply for a visa', and such alternatives are excluded by (69b). On an intensional view, a proposition defines a set of possible worlds (viz. the set of those worlds in which it is true), so (69b) quantifies over sets of possible worlds. If we form the generalized union of the sets of possible worlds excluded by (69b), we arrive at a set that was already represented in Figure 1 above, which we didn't however identify as a set deserving special attention, viz. V-(S∩V), the complement of V relative to the intersection of S and V. This set has only those worlds as members in which the visa requirements of the real world are enforced, but no worlds in which Old Wang goes to the embassy. Figure 3 reproduces Figure 1 and newly introduces the sets S' and P.

S
{w: O.W. goes to the embassy in w}

R'
{w: O.W. can apply for a visa in w}

V
{w: everything is as or almost as required by the real-world regulations for the issuing of visas in w}
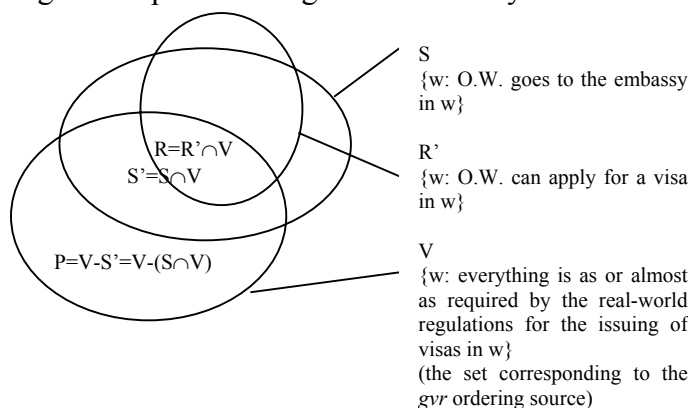(the set corresponding to the *gvr* ordering source)

Figure 3: Sets of possible worlds relevant to the interpretation of (68a)/(69a), including information-structure

The realistic p-set of our sentence contains only propositions that are incompatible with the truth of the nuclear scope proposition, that is, worlds in which it is not the case that Old Wang goes to the embassy (cf. the delimitation of realistic p-sets for *cái*-foci in sections 7.4 and 7.5). The rest of the complex proposition remains the same for all members of the realistic p-set. This realistic p-set amounts to set P in Fig. 3, viz. to the complement of S' relative to V. The worlds in P are asserted by (69b) to be worlds in which it is impossible that Old Wang can apply for a visa, given the real-world regulations for the issuing of visas. The worlds in which an application was possible were identified above as the worlds in R. And, indeed, as may easily be seen from Fig. 3, P and R have no members in common. This is precisely what (69b) requires. At the same time, this is an equivalent way of expressing the modal semantics of (69a). If R must be a subset of S (that amounts to the necessity component of the sentence; cf. Fig. 2), then R cannot have any members in the relevant complement of S, viz. in P (that amounts to the 'only'-entailment). Both ways of determining truth-conditions lead to the same result, and this constitutes the perfect fit of modality and information-structure in the construction under scrutiny here.

The reasoning just given is not fully compositional in that it has not provided us with denotations for all nodes in the syntactic representation of our sample sentence. It is basically compositional, though, in that the denotations of major constitutents have been clarified. I will summarize these denotations in (71) for the sample sentence in (70). If compared with (69a), (70) has been changed slightly so as to correspond more straightforwardly to an LF representation, as I assume it here. (Traces are not represented. As before, *gvr* stands for 'given the visa regulations of the actual world'). As justified a moment ago, (71f) and (71g) are just different ways of stating equivalent truth-conditions.

(70) [[$_{NEC+S}$[$_{NEC}$ bìxū] [$_S$ Lǎo Wáng qù   dàshǐguǎn]],
                       must   old Wang go.to embassy
     [$_{Rcái}$ cái   [$_R$[gvr] [Lǎo Wáng néng shēnqǐng   qiānzhèng]]]].
          CAI   old Wang can   apply.for visa
     'Only if [Old Wang goes to the embassy] can he apply for a visa.'/
     '[Old Wang <u>must</u> go to the embassy] to be able to apply for a visa.'

(71) a. $[\![R]\!]$ = {w: the real-world regulations for the issuing of visas are observed in w and Old Wang can apply for a visa in w}

     b. $[\![R_{cái}]\!]$ = $[\![R]\!]$ (R figures in an 'only'-type quantificational structure, but no constituent of R may be (part of) the focus)

     c. $[\![NEC]\!] = \lambda S \lambda R_{cái}.R_{cái} \subseteq S$

     d. $[\![S]\!]$ = {w: Old Wang goes to the embassy in w}

     e. $[\![NEC+S]\!] = \lambda R_{cái}.R_{cái} \subseteq$ {w: Old Wang goes to the embassy in w}

     f. $[\![(70)]\!]$ = {w: the real-world regulations for the issuing of visas are observed in w and Old Wang can apply for a visa in w} $\subseteq$ {w: Old Wang goes to the embassy in w}

     g. 'only'-entailment of (70): $\neg \exists p$ [$p \in [\![(70)]\!]^f_R$] [p is true] = {w: w $\in \bigcup [\![(70)]\!]^f_R$} $\cap$ {w: $w \in p_{ASS}$}= $\varnothing$

I am optimistic that the analysis which has been spelled out for a single sentence here is general enough to be applied to all *cái*-sentences which, at first, seem to have a necessity modal in the wrong, viz. subordinate, position. As said above, more attested examples in addition to the ones in (52)–(54) have been collected in the appendix, and the reader is invited to apply the above reasonings to them.

The most important ingredient of the analysis is the reverse argument structure of the modal in this construction. This way, the restrictor of the modal ends up in the syntactically superordinate position. The second peculiar property of the construction with the main clause modal restrictors is the custom-tailored interplay of modality and focus semantics. What is in

the restrictor of the modal may not be in focus. To be sure, foci within the nuclear scopes of modal structures may also be prototypical in other modal constructions for the simple reason that the restrictors of modal tripartite structures are often implicit. But our construction enforces this mapping, and that makes it peculiar. What is more, it forces the coincidence of focused material and modal nuclear scope material *at the cost of a non-prototypical syntax*. A prototypical syntax would accommodate the focus and the nuclear scope in the matrix VP, but precisely this is excluded in the construction with main clause modal restrictors.

8.5 Main clauses as *ad-hoc* restrictors with other particles

All the examples in the preceding section were *cái*-sentences. Analogous examples also occur with *jiù*, and with *zài*. *Jiù* is the background agreement marker of negated universal focus quantification discussed at length in section 5. *Zài* is a peripheral member of the paradigm of background markers which I haven't discussed in this paper. If the analysis in Hole (2004: 240–5) is correct, its realistic p-set is restricted to a cardinality of 1, and this single alternative is false. The restriction of the cardinality of the p-set, plus the exclusion of an alternative, makes *zài* look like a variant of *cái* ($\neg\exists$) in some examples, and of *jiù* ($\neg\forall$) in others.

(72) and (73) present one example with *jiù* and with *zài*, respectively. The discussion of these sentences is preliminary and serves mainly to mention possible points of departure for future research.

(72) [Lǎo Wáng z̲h̲ǐ̲-y̲à̲o̲   qù dàshǐguǎn] tā jiù   néng shēnqǐng   qiānzhèng.
      Old Wang only-must go embassy   he JIU   can   apply.for   visa
      'Old Wang only has to go to the embassy to be able to apply for a visa.'/
      'If Old Wang goes to the embassy, he can apply for a visa.'
(73) [Wǒmen z̲h̲ǐ̲h̲ǎ̲o̲   xiān huíqù ná-le   qián],   zài lái bàomíng.(rp: 51)
      we   have.no.choice.but.to first return take-ASP money ZAI come sign.up
      'It seems we'll have to return home first and get the money before we can come back and sign up.'/'We'll only come back and sign up after we have returned home to get the money.'

The analysis of these sentences is complicated by the fact that we always find a focus marker in addition to, or as part of, the modal operator in the subordinate clause. *Zhǐyào* in (72) illustrates the relatively perspicuous case of a function word made up of two components that we have repeatedly referred to in the present paper, namely *zhǐ* '(adverbial) only' and *yào* 'must, be necessary'. The perspicuity of this form is in contrast with its usual treatment in didactic grammars and some linguistic accounts because *zhǐyào* is commonly categorized as a complementizer meaning 'if', which obligatorily triggers the use of *jiù* in the main clause. Given what we know about the parallel cases in *cái*-sentences, this is certainly a superficial analysis. In the context of this paper I will, however, not be able to come up with a competing analysis that is as explicit as the one for analogous *cái*-sentences. The recalcitrant fact is that it is not obvious how the overall type of focus quantification in (72) ($\neg\forall$) can be matched with the 'only'-word plus the necessity modal in the subordinate clause. In terms of paraphrases, the answer seems simple. If, for (72) to be true, Old Wang only has to go to the embassy to be able to apply for a visa, then some other action may also yield the same result (say, sending all the required materials by mail), but not all alternative actions will do (say, making a phone call to the embassy). What is not clear to me is how the prefixing of *zhǐ-*/'only' before the modal of necessity annuls the special requirement found with the necessity modals of sections 8.2 through 8.4, viz. that *nothing else* will do.[24]

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[24] This problem will probably not boil down to another version of the converseness problem associated with the relationship between *if*-conditionals and *only-if*-conditionals. For the discussion of this problem see, again, von Fintel (1994, 1997) or Hole (2004: 129–38).

Similar things can be said about (73), except that this sentence features an additional complication, viz. the function word *zhǐhǎo*. On the one hand, *zhǐhǎo* is normally left unanalyzed and is rendered as 'must, have no choice but to' in dictionaries. On the other hand, *zhǐhǎo* contains *zhǐ* 'only' again, and *hǎo* alone has a (somewhat underdetermined) modal use as 'can, should, it is best to'. The most common use of the character used to write *hǎo* is as a word meaning 'good', and the modal use is clearly related to this use as an adjective or stative verb. I have no synchronic analysis of *zhǐhǎo*, and in the absence of one I will refrain from making any further speculations. Suffice it to say that, just as in (72), the interplay of focus semantics and modality triggers our peculiar construction again in which matrix VPs are mapped to restrictors of modal tripartite structures, and to backgrounds of focus-quantificational structures at the same time.

9. Non-canonical structures III: Conventionalized main clause modal restrictors

A construction especially designed to express *ad-hoc* modal restrictors, as discussed in the preceding larger section, may be a good thing to have, but something better is yet to come. I claim Mandarin has a construction expressing *conventionalized* modal restrictors or ordering sources irrespective of modal force.[25] This is the last empirical sub-domain that we will review in this paper, and it will hopefully serve to plausibilize further the idea that main clause predicates in Mandarin are a conventionalized position for restrictors in non-canonical quantificational structures.

(74) is an instance of a sentence with a conventionalized modal ordering source marker in the root-VP.

(74) [Wǒ xīwàng méi yǒu shì]   cái   hǎo!
       I   hope   not exist trouble CAI OPTATIVE
       'I really hope there will be no trouble!'

The translation and the gloss given in (74) presuppose a certain analysis of the sentence. *Hǎo*, a stative verb or adjective with the basic meaning '(be) good', is glossed as an optative marker here. If we were to translate (74) in one of the ways we translated the sentences in the preceding section, we would get 'Only if there is no trouble is it good'. Apart from the fact that this translation would miss the point of the word *hǎo* in the example, it still serves to show that sentence (74) instantiates a sub-type of our previous sentences in that "the modal is in the way".

Our introductory example (74) may be good to justify the general subsumption of the construction treated here under the more general type of sentences with main clause modal restrictors. It is not very good, though, to demonstrate that *hǎo* has the function of an optative or bouletic ordering source marker, because *xīwàng* 'hope', by way of its lexical content, already includes information concerning the ordering source. A better example to make the point concerning the marking of the ordering source would be (75), in which the modal is implicit.

(75) [Nǐ zhīdao] jiù hǎo le!
       you know   JIU good PRT
       'I'm glad [you know it]!'/'I wish [you knew it]!'/'I wish [you'd known it]!'

(75) is multiply ambiguous in that neither the temporal relations nor the realis or irrealis status of the embedded proposition is signaled. Nevertheless, all faithful translations of this sentence into English make reference to the speaker's hopes or desires by the use of an adequate modalizing expression (*glad* or *wish* in (75); adverbs like *fortunately* or *hopefully* would also be

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[25] I know of no other treatment of this construction in the literature. Alleton (1972: 138, 151) identifies the relevant cases as deserving special attention, but no attempt is made at an analysis.

appropriate given matching contexts in terms of factuality). Put differently, the set of restrictor worlds is defined so as to include only worlds in which the things that the speaker desires are true. If we compare this construction with the main clause *ad-hoc* restrictors of the previous section, the following difference emerges. Part of the restrictors of the modal constructions in the previous sections were implicit. In the example dealing with Old Wang's visa application, the regulations for the issuing of visas were implicit. The set of the ideal worlds defined by this implicit ordering source (V), was then intersected with the set of worlds as defined by the main clause proposition (R'; worlds in which Old Wang can apply for a visa). The resulting overall restrictor, R, then corresponded to that set of worlds in which the visa regulations of the real world were observed and in which Old Wang could apply for a visa. The construction discussed here expresses the conventional ordering source in that syntactic position in which the *ad-hoc* restrictor component occurred in the other construction.

The special status of this construction with conventionalized markers of the ordering source is evinced by the following facts (see Hole 2004: 260–1 for exemplification):

(i) nothing may intervene between the agreement particle and the following predicate; in other complex *cái/jiù*-sentences, negation markers, adverbial material and some other things may occur in this position;

(ii) nothing may intervene between the right edge of the subordinate clause (*zhīdao* in (75), *shì* in (74)) and the agreement particle; typically this is a possible subject position (cf., for instance, (72)).

(iii) the predicate following *cái* or *jiù* in the construction is never used in its literal, or most basic sense.[26]

The maximum structure for sentences with "sentential endings" expressing the modal ordering source is given in (76) (PRT stands for the sentence-final particles that are frequently used in Mandarin; they don't matter here).

$$(76) \qquad \text{clause} + \begin{Bmatrix} cái \\ jiù \end{Bmatrix} + \begin{Bmatrix} hǎo \\ duì \\ xíng \\ kěyi \\ shì \end{Bmatrix} + \text{PRT}$$

The interplay of the properties which define the construction, especially (i) and (ii), leads to the effect that the sequence of *cái/jiù*, the ordering source marker and the possible sentence-final particle may be recategorized as a single complex sentence-final particle. I cannot make any well-grounded statement as to how much the 'clause'-part of (76) has lost its embedded status already, but it seems clear that it will lose it over time.[27]

We have only seen uses of *hǎo* as a conventionalized ordering source marker so far, and there's a reason for this. While the classification of *hǎo* as marking optative or bouletic ordering sources is beyond doubt, the ordering sources corresponding to most other markers are still somewhat unclear to me. The only other marker whose function is fairly clear is *duì* (literally: 'right'). It denotes ordering sources of a moral kind; that is, it ranks worlds as to how close they come to an ideal in terms of the quality or appropriateness of interpersonal and social behavior. The examples in (77) may suffice to illustrate this use.

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[26] This latter property may not serve to define the construction in a strict sense, because it is not independent of the analysis that I propose for it.

[27] Cf. Bisang's (1992) idea of an 'attractor position' for the emergence of modal markers at the right periphery of Chinese sentences. The sentence-final focus-sensitive expression *éryǐ* 'only, that's all' is an example of a function word which has gone through precisely this conventionalization channel. It combines an old conjunctional element (*ér*) with an old verb *yǐ* 'to end'.

(77) a. [Nǐmen yīnggāi jiào wǒ 'āyí'] cái duì! (rp: 2)
　　　 you should call I aunt CAI MORAL
　　　 '[You should really call me 'Auntie']!'/'Be good kids and [call me 'Auntie']!'

　　 b. [Wǒmen yīnggāi xièxie nǐ] cái duì!
　　　 we should thank you CAI MORAL
　　　 'It is a matter of proper behavior that we thank you!'/'We are really morally obliged to thank you!'

　　 c. [Nǐ juān qián] jiù duì le!
　　　 you donate money JIU MORAL PRT
　　　 'The fact/possibility of your donating money is fine (from a moral perspective)!'/'You can donate the money, and you'll have done a good deed.'

In Hole (2004: 263) I propose an implementational ordering source for *xíng* '(lit.:) be okay/work out fine' and *kěyǐ* '(lit.:) be possible/allowed', and it seems that this ordering source always relates to the requirements of certain schemas of conventional actions, such as buying and selling, or negotiating some provision of a service. The last ordering source marker in (76), *shì* '(lit.:) be right', is the one I know least about, and I will refrain from speculating about its possibly purposive ordering source here.

The reader may be convinced at this point that we are really dealing with conventionalized markers of ordering sources independent of the modal force (note that (77c) must be argued to contain an implicit possibility modal, while other sentences above have universal modal force). What is not so clear is, once more, the exact matching of modality types on the one hand, and *cái*-marking vs. *jiù*-marking on the other. Another area that requires further clarification is the realis/irrealis distinction in the construction with conventionalized modal restrictors. It may turn out that *cái*-sentences are always restricted to non-factual readings, that is, the proposition in the nuclear scope of the modal did not hold in the past and does not hold at the moment of utterance. This restriction does not seem to be active in *jiù*-sentences (cf. (75) or (77c)). But even with these uncertainties in mind, the potential of this construction to underpin the main claim of this paper is not challenged; Mandarin makes regular use of a non-canonical way of mapping syntactic structure and quantificational structures such that the restrictor ends up syntactically superordinate, and the nuclear scope subordinate. Moreover, the parallelism between the information-structural mappings and the modality mappings manifests itself perspicuously in this domain as well. The largest possible foci in sentences with conventionalized markers of the modal ordering source coincide with the nuclear scopes of the modal structures.

10. Conclusions

This paper has concentrated on a non-canonical, though perfectly regular, group of Mandarin sentence types which is characterized by the consistent mapping of VPs to the nuclear scopes of tripartite structures. All the relevant sentences are sentences in which the relevant tripartite structures are focus-background structures. Parasitic on this, non-canonical modal quantification may be expressed.

We have seen a fully unfolded system of focus-quantificational types. 'Fully unfolded' is meant to capture the fact that all four quantificational types of classical logic ($\forall$, $\exists$, $\neg\forall$, $\neg\exists$) are conventionalized. The assumption of a conventionalization of the $\neg\forall$-type of focus quantification is probably a matter of controversy, but I have tried to show how this quantificational type fits into the system.

To get the system of four quantificational types to work, we made use of the auxiliary concept of 'realistic p-sets'. Realistic p-sets are an innovation which allows one to state a restriction on sets of alternatives which is not delivered by the context, and probably not by the focus-sensitive particles, either. Instead, realistic p-sets emerge because of general requirements that

hold for common grounds. Common grounds may not be contradictory, and no trivial information should be added to them. These requirements allow us to sort out different, though easily definable alternatives from p-sets, depending on the type of focus quantification relevant for the sentence at hand.

The idea of a single format of focus quantification went hand in hand with the assumption that differences between focus quantificational types should be stated locally. This locality requirement was implemented by allowing tripartite focus quantificational structures to differ in the position of the quantifier only. If we abstract away from the individual focus quantifiers in these tripartite structures, we arrive at a general focus semantic format. A restrictor and a nuclear scope are headed by an unspecified quantifier which ranges over propositions/sets of possible worlds. This may be implemented as a tripartite structure which has an open argument slot in the position of the quantifier. In the absence of a focus quantifier provided by material in a sentence, this argument slot may be saturated by (existential) discourse focus closure.

Further innovations propagated in the sections on non-canonical sentences with modals were modal operators which take their arguments in reverse order if compared with standard modals. The backgrounded VP material in these sentences is not just mapped to the nuclear scopes of the focus quantificational structures; it also ends up in the restrictors of the modal tripartite structures.

If one takes Kratzer's (1981, 1991a) theory of modality seriously, the discovery of conventionalized modal ordering source markers irrespective of modal force should not be much of a surprise – which, in fact, it was for me and probably is for many researchers. But if Kratzer has identified the onomasiological components of modality correctly, then each component ought to be subject to analytical expression in some language. Seen from this angle, the conventionalized ordering source markers identified in this study provide a piece of empirical support for Kratzer's modeling of the realm of modality and, in particular, for her division of modal restrictor material into modal base (epistemic vs. circumstantial) and ordering source.

Considering the degree of syntactic entrenchment of the phenomena which I have discussed, one may wonder 'where semantics meets pragmatics' in this contribution, or whether semantics meets pragmatics at all. We have seen very rigid syntactic patterns in the constructions under scrutiny, structures that were concomitant with the semantic patterns of information-structure. No pragmatics here. Moreover, I have followed the tradition which semanticizes and syntacticizes contextual information by assuming context anaphora as constituents. No pragmatics there, either. Shouldn't this paper rather be included in a collection entitled 'Where semantics eats pragmatics', then? I think not. Admittedly, I have concentrated on phenomena that belong to core grammar, but if we zoom out a bit, a true semantics-pragmatics issue defines our whole investigation. Recall from the first section and from remarks made throughout the paper that there are not just non-canonical mappings of VPs to restrictors in Mandarin, but also, and probably predominantly, canonical mappings of VPs to nuclear scopes. Examples of such canonical cases are repeated in (78) and (79).

(78) Lǎo Wáng zhǐ hē   chá.
     Old Wang only drink tea
     'Old Wang only drinks tea.'
(79) Lǎo Wáng bìxū qù   dàshǐguǎn.
     Old Wang must go.to embassy
     'Old Wang must go to the embassy.'

In (78), the VP does include the focus, and in (79), the VP is mapped to the nuclear scope, while the restrictor is implicit. Therefore, Mandarin presents speakers with a choice between canonical and non-canonical matchings of syntax and quantification. What makes them

choose either option? I have no answer to this question, just tentative ideas. First and foremost, sentences with non-canonical mappings tend to be more "emphatic" than the sentences in (78) and (79). How this is to be modeled, if it is empirically correct, will again be controversial. Semanticists may define sentence-level operators à la Krifka (1995) which implement the semantic counterparts of emphasis (exhaustivity, scalarity, etc.). Pragmaticists may prefer to leave the choice between the canonical and the non-canonical mappings to softer factors. Whichever road one takes, the pragmatics will have to make available the right kinds of objects from which semantics may take what it needs. Perhaps I should try and convince the editors that the volume should be renamed 'Where pragmatics feeds semantics'.

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Appendix

(i)   Tā   bìxū   xiān   juédìng   zìjǐ-de   xíngdòng, cái   néng   yùcè   biànhuà-de   hòuguǒ.
       (s)he   must   first   decide   self-of   actions   CAI   can   predict   change-of   outcome
       'He must first be clear about his own actions before he can predict the outcome of the changes.'/'Only if he is clear about his own actions first can he predict the outcome of the changes.' (adapted from Eifring 1995: 239)

(ii)   Tā   bìxū   guīguījǔjǔ,   cái   néng   duìdeqǐ   jiānglái-de   lǎopó.
       (s)he   must   be.very.well-behaved   CAI   can   be.worthy.of   future-of   wife
       'He must behave extremely well to be able to live up to the standards of his future wife.'/'Only if he behaves extremely well will he be able to live up to the standards of his future wife.' (Eifring 1995: 225)

(iii) Qián cè   shang   yào   jīngdǎxìsuàn,   cái   yǒu   hǎo   rìzi   guò.
       money strategy   on   must   act.with.extreme.caution   CAI   have   good   days   spend
       'One has to act with extreme caution in money affairs if one wants to live comfortably.'/'Only if one acts with extreme caution in money affairs can one live comfortably.' (rp: 44)

(iv)   Tàitài   yīdìng   yào   zhǎngwò   xiānshēng-de hébāo, xiānshēng cái   bù   huì   luànlái.
       wife   definitely   must   control   husband-of   purse   husband   CAI   not   will   get.out.of.control
       'A wife must be in control of her husband's money in order for the husband not to get out of control.'/'Only if a wife is in control of her husband's money will the husband not get out of control.' (rp: 26)