

On Subject Specificity

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0. Introduction

To understand the interpretations of subject indefinites, it is imperative to understand how the distribution of subjects interacts with the lexical semantics of a particular language. It is observed cross-linguistically that there are two types of indefinite subject interpretations: One is quantificational, including specific and generic readings; the other is non-quantificational, consisting of nonspecific nongeneric readings. For example, the English subject of (1) is ambiguous: specific as paraphrased in (1a), and nonspecific as paraphrased in (1b):

- (1) A man arrived yesterday.
a. A certain man arrived yesterday. (specific)
b. One man (rather than two) arrived yesterday. (nonspecific)

Reuland (1988), among others, attributes this to a lexical ambiguity of the English article *a*. It can be construed either as a strong determiner in Milsark's (1974) sense, resulting in the specific reading of (1a), or as a cardinality predicate, resulting in the nonspecific reading of (1b). On the other hand, it is also recognized in the linguistic literature that there are two types of subject positions for indefinite NPs: The higher one is associated with specific or generic readings, while the lower one is associated with nonspecific nongeneric readings. Diesing (1992), for example, points out that German bare plural subjects may appear in one of two distinct syntactic positions, delineated by sentential adverbials such as *ja doch* 'indeed'. Consider the following contrast:

- (2) a. ... weil Linguisten ja doch Kammermusik spielen.
since linguists indeed chamber music play
'... since linguists play chamber music.' (generic)

b. ... weil ja doch Linguisten Kammermusik spielen.
since indeed linguists chamber music play
'... since linguists are playing chamber music.' (nongeneric nonspecific)

In (2a), the bare plural subject *Linguisten* 'linguists' occupies a higher position, Spec of IP according to Diesing, and can only be construed as generic. In contrast, *Linguisten* occupies a lower position in (2b), presumably Spec of VP, and can only be construed as nongeneric nonspecific.¹

¹ See Bobaljik & Jonas (1996) for a more elaborated analysis of these two subject positions. Assuming an articulated IP structure developed by Pollock (1989) and Chomsky (1991,1993), they identify the higher position as Spec of Agr_SP, and the lower one as Spec of TP, based on evidence from Icelandic as well as German. We will return below to reconcile the incompatibility between their analysis and Diesing's (1992) original IP-VP dichotomy.

Questions arise as to how these two factors, lexical for the former and structural for the latter, fare with seemingly random variations across languages, such as the following contrasts between Dutch and Chinese (all the Dutch data below from Reuland 1988):²

- (3) a. Judy dacht dat zes mannen arriveerden.
 Judy thought that six men arrived
 'Judy thought that six specific men arrived.' (specific, *nonspecific)
- b. *Judy dacht dat een man arriveerde.
 Judy thought that a man arrived
 'Judy thought that a person arrived.' (*specific, *nonspecific)
- (4) a. *Akiu yiwei liu-ge ren dao-le.
 Akiu thought six-Cl person arrive-Prf
 'Akiu thought that six persons arrived.' (*specific, *nonspecific)
- b. ?Akiu yiwei yi-ge ren dao-le.
 Akiu thought one-Cl person arrive-Prf
 'Akiu thought that a certain person arrived.' (?specific, *nonspecific)

While Dutch plural numeral NPs are construed as strong quantifiers in (3a) (hence the specific subject reading), their Chinese counterparts are ruled out in the corresponding construction (4a). Rather curiously, singular numeral NPs behave almost the other way around in these two languages. For at least some speakers of Chinese, the numeral *yi* 'one' can be construed as a strong determiner, as evidenced by the marginal 'certain' reading of (4b), whereas its Dutch counterpart *een* 'a' is ruled out in (3b), whether it is construed as specific or not.

There is also a problem concerning a specific/nonspecific asymmetry among subjects of various constructions. As Reuland (1988) observes, Dutch transitive sentences such as (5a,b) differ from their unaccusative counterparts (3a,b) in allowing nonspecific subject readings:

- (5) a. Judy dacht dat zes jongens een baan gekregen hadden.
 Judy thought that six boys a job got had
 'Judy thought that six boys had got a job.' (specific, nonspecific)
- b. Judy dacht dat een man die hond geslagen had.
 Judy thought that a man the dog hit had
 'Judy thought that a man had hit the dog.' (*specific, nonspecific)

Chinese modality sentences, in contrast to the normal tensed constructions (4a,b), also allow nonspecific subject indefinites, as shown by the following examples:

² Whether singular numeral indefinites are allowed in Chinese subject positions has been under much debate. Judgements vary depending on the choice of predicates, modality, and contexts (see Lee 1986, Li 1996, Shi 1996, Shyu 1995, and Xu 1996 for comprehensive discussions on the issue). It should be noted that while some speakers systematically allow sentences like (4b), no one accept such a sentence in its nonspecific interpretation. We will clarify part of the issue in the discussion below. The abbreviations used in this paper are glossed as follows: Cl: classifier; Exp: experiential aspect; Inc: inchoative aspect; Nom: nominative; Prf: perfective aspect.

- (6) a. Akiu yiwei liu-ge ren tai-de-qi nei-kuai shitou.
 Akiu thought six-Cl person lift-can-up that-Cl rock
 'Akiu thought that six persons can move that rock.' (*specific, nonspecific)
- b. Akiu yiwei yi-ge ren tai-de-qi nei-kuai shitou.
 Akiu thought one-Cl person lift-can-up that-Cl rock
 'Akiu thought that a person can move that rock.' (?specific, nonspecific)

A proper theory of subject specificity should not only take into consideration the lexical and structural factors in question, but also provide a parametric account of the variations and parallels across languages. This paper sets out to address the issue from a viewpoint of the syntax-semantic interface, based upon an extension of Diesing's (1992) Mapping Hypothesis, as sketched below:³

(7) *Extended Mapping Hypothesis:*

- a. Mapping applies cyclically, and vacuous quantification is checked derivationally.
- b. Material from a syntactic predicate is mapped into the nuclear scope of a mapping cycle.
- c. Material from XP immediately dominating the subject chain of a syntactic predicate (excluding that predicate) is mapped outside the nuclear scope of a mapping cycle.
 A subject chain is an A-chain with its tail in a subject position.
- d. Existential closure applies to the nuclear scope of a mapping cycle.

Under this approach, we attribute linguistic variations to lexical requirements and parametric setups of individual languages, pursuing Chomsky's (1993) intuition that languages differ only in the lexicon and PF. On the other hand, we aim to capture the structural generalization of the specific/nonspecific dichotomy with the dynamic tree-splitting mechanism (7a-d) and the tripartite quantificational theory in the vein of Kamp (1981) and Heim (1982).

This paper is organized as follows: In section 1, we give a brief introduction to the Extended Mapping Hypothesis (EMH) and its implications concerning a typology of mapping geometries, V-to-I type vs. V-to-V type. Section 2 pursues the issue further on empirical grounds. Together with Chomsky's (1993) Copy Theory, we argue that the linguistic variations presented in (1-4) can be derived in a principled way, and lowering operations needed for nonspecific subject interpretations can be dispensed with. Moreover, we will argue that the two distinct types of mapping geometry are also responsible for the asymmetry between Dutch unaccusative and transitive constructions (i.e., that between (3) and (5)). Section 3 extends our analysis to Chinese

³ The original formulation of the EMH is given by Tsai (1994b: Chap 3). Here we adopt part of Percus's (1995) reformulation of the EMH, who points out quite a few implications of the EMH in regard to adverbs of quantification. Essentially, Percus endorses a weaker version of the EMH, where a mapping cycle is not built on a predication structure, but on an adverbial quantificational structure (that is, a tripartite structure headed by an adverb of quantification). Following is his revision:

(i) Material from XP immediately dominating a syntactic predicate (excluding that predicate) is mapped outside the nuclear scope of an adverbial quantificational structure.

I will refer the readers to Percus (1995) for a detailed discussion of the interaction between cyclic mapping and adverbial quantification. On the other hand, (7c) constitutes a strong version of the EMH, where quantification is claimed to have a direct bearing on predication. See further discussions in section 1.2.

modality constructions. We will show that the EMH accounts for the interpretive parallel between (1) and (6). In section 4, we will end this paper by addressing some consequences and problems of this approach.

1. Where Have All the Nonspecific Readings gone?

1.1. A Theory of the Syntax-Semantics Interface

Since the dawn of generative linguistics, the question when and how meaning comes into play in syntactic derivations has generated tremendous interests and controversies. Without being able to do justice to all the intriguing issues raised in the past four decades, we will simply present a view coherent to our current analysis. Essentially, we held the position that both syntactic and semantic properties are highly organized in such a manner that there is a principled way to relate one to the other. Moreover, we will take syntax as the input of semantics, rather than in the other way around, as vigorously contended by generative semanticist, or in the form of "parallel processing", as generally assumed in Montague semantics. On the other hand, we do not view syntax and semantics as discrete components. Instead, the syntax-semantics interface is regarded as one of the stages of derivation toward Logical Form (LF), on the assumption that semantic representations retain part of the crucial information carried by their syntactic counterparts, such as hierarchical constituency and scopal dependencies. Without associating any independent property with the interface, we motivate syntax-semantics mapping purely on the ground of Full Interpretation (FI): Only a legitimate output of semantic composition counts as fully interpreted, hence accessible to the cognitive module on the level of LF, a true interface in Chomsky's (1993) sense.⁴

Furthermore, we adopt a straightforward lexical semantics, in which some basic semantic properties are represented as lexical features. For example, a determiner can be either [+strong] or [-strong], based on Milsark's (1974) insight. On the syntax-semantics interface, [+strong] determiners are construed as quantifiers, and [-strong] ones as cardinal predicates.

To make our point more concrete, let's start with the English indefinite article *a(n)* in (1). It is tempting to attribute the dual interpretations of (1a,b) to a lexical ambiguity of *a(n)*. That is, we can take the indefinite article as either [+strong] or [-strong], responsible for the specific and nonspecific readings respectively. However, the German data presented in (2) rules out this straightforward account, the reason being that there is no way for the lexical ambiguity analysis to correctly predict the word order, i.e., specific subject > adverbial > nonspecific subject. As Diesing (1992) argues quite convincingly, it is necessary to postulate two distinct positions for subject interpretations, presumably Spec of IP and Spec of VP given the VP-internal subject hypothesis (cf. Fukui & Speas 1986, Koopman & Sportiche 1988, Kuroda 1988, Huang 1993, among others). A real solution, therefore, is bound to appeal to the structural ambiguity as well as the lexical ambiguity.

Our problem can thus be formulated as follows: Why does a specific subject locate higher than a nonspecific one, but not vice versa? And how does the structural factor interact with the lexical factor in deriving correct word orders and interpretations? Diesing (1992) has provided an

⁴ Here the notion of Full Interpretation (FI) is construed more in line with the original definition given in Chomsky (1986). Chomsky (1993), on the other hand, suggests that FI be taken as a convergence condition on both PF and LF. It requires that syntactic representations consist entirely of legitimate objects, hence fully interpretable to the articulatory-perceptual and conceptual-intentional components respectively.

explicit answer, based on the well-known tree-splitting mechanism (8). It maps a GB-theoretical representation to a tripartite quantificational structure (cf. Kamp 1981 and Heim 1982):

(8) *Mapping Hypothesis* (Diesing 1992):

- a. Material from VP is mapped into the nuclear scope.
- b. Material from IP (excluding VP) is mapped into a restrictive clause.

Diesing claims further that existential closure applies to VP, rather than to IP or Text as originally proposed by Heim (1982). As a result, the mapping processes of (1a,b) can be visualized in (9a,b) respectively (irrelevant details omitted):

- (9) a. $[_{IP} \text{ a man}_i [_I \dots [_{VP} t_i [_V \text{ came}]] \dots]] \text{ } (a(n) : [+strong])$
- $a_x [_{restrictive \text{ clause}} x \text{ is human}] [_{nuclear \text{ scope}} x \text{ came}]$
(mapping applies)
- b. $[_{IP} \text{ a man}_i [_I \dots [_{VP} t_i [_V \text{ came}]] \dots]] \text{ } (a(n) : [-strong])$
- $[_{IP} t_i [_I \dots [_{VP} \text{ a man}_i [_V \text{ came}]] \dots]]$
(subject undergoes LF lowering)
- $\exists_x [_{nuclear \text{ scope}} x \text{ is singular \& } x \text{ is human \& } x \text{ came}]$
(mapping applies)

In (9a), $a(n)$ is a [+strong] determiner and accordingly construed as a quantifier on the syntax-semantics interface. It licenses the variable introduced by the IP subject, resulting in the specific reading of (1a). In (9b), $a(n)$ is a [-strong] determiner and accordingly construed as a singularity predicate. According to Diesing, the IP subject is forced to lower back to Spec of VP due to the imminent vacuous quantification. As the lowered subject is licensed by existential closure on VP, the nonspecific reading of (1b) is ensured. The same analysis applies to (2a,b) except that there is no need for lowering: Since the German bare plural in Spec of IP is outside of the nuclear scope, the variable it introduces during mapping is not subject to existential closure, and thus requires extra licensing from an implicit operator associated with the generic tense (cf. Wilkinson 1986, among others). In contrast, the bare plural in Spec of VP is within the nuclear scope, and therefore bound by existential closure.

Then how about those ill-behaved subject indefinites in Dutch and Chinese, as seen in (3) and (4)? Let's start with a data-driven taxonomy, as sketched below:⁵

Table 1.

⁵ One way to think about the feature strength in question is to suggest that cardinal determiners are predicates rather than operators. Therefore, they are by default [-strong] cross-linguistically. When children learned expressions like *a man* can be construed as specific in English, they may well make the assumption that *a* is optionally [+strong].

	singular cardinal determiner	plural cardinal determiners
English	[±strong]	[±strong]
Dutch	[-strong]	[±strong]
Chinese	[±strong]	[-strong]

It is not difficult to see that, even with this taxonomy, the Mapping Hypothesis (henceforth MH) alone does not automatically account for the deviance of (3b) and (4a). This is because a weakly quantified subject indefinite (i.e., a subject indefinite with a [-strong] cardinal determiner) should be able to undergo lowering to Spec of VP (cf. the derivation of (9b)). This is obviously not the case with (3b) and (4a): Unlike their English counterparts, the Dutch and Chinese sentences are out even with nonspecific interpretations. The MH thus appears to be too weak in this respect.

As Diesing (1992: 81-82) suggests, there are two remedies available. One is to claim that mapping applies at S-structure in Dutch and Chinese, as well as in German. As a result, the subject indefinite in question won't have a chance to undergo lowering. This option, however, is not entirely satisfactory under our approach. For one thing, we would like to stick to the minimalist assumption that no independent property should be associated with S-structure, which is defined as a SPELL-OUT point to PF (cf. Chomsky 1991,1993). For another, the syntax-semantics mapping envisioned here is an one-time affair, applying only to the output of LF, synchronizing with semantic composition in a cyclic manner (cf. section 1.2). Consequently, there is no such notion as S-structure mapping in this theory. The other remedy is to prevent LF lowering from applying in Dutch and Chinese, which has about the same effect on the interpretations of subject indefinites.⁶ We reject this option on the ground that lowering should be disallowed in principle, since it creates a "reversed" chain, where the head is bound by the tail.

Even if we take the above remedies for granted, the MH is still both too strong and too weak. It is too strong because it wrongly rules out Dutch transitive sentences (5a,b) and Chinese modality sentences (6a,b): Both remedies require that the indefinite subjects in question should not be restored to Spec of VP. The prediction is that nonspecific readings should not be allowed in (5) and (6), which, nevertheless, is not borne out. On the other hand, the MH is too weak because it wrongly rules in (3b) and (4a). Consider (3b) first. According to the above remedies, the singular indefinite *een man* 'a man' is excluded from the embedded Spec of VP, and hence not subject to the would-be existential closure on the embedded VP node. As illustrated by (10), once (3b) is mapped onto its LF representation by the IP-VP splitting mechanism, the variable introduced by *een man* should be able to get licensing from the existential closure on the matrix VP node:

(10) * $[_{IP} \text{ Judy } \exists_x [_{VP} \text{ dacht dat } [_{IP} \text{ een man } (x) (\exists) [_{VP} \text{ arriveerde}]]]]$.
 Judy thought that a man arrived

Contrary to the prediction, (3b) is not grammatical. The same problem occurs with the plural subject indefinite *liu-ge ren* 'six people' in (4a), as illustrated below:

(11) * $[_{IP} \text{ Akiu } \exists_x [_{VP} \text{ yiwei } [_{IP} \text{ liu-ge ren } (x) (\exists) [_{VP} \text{ dao-le}]]]]$.
 Akiu thought six-Cl person arrive-Prf

⁶ See also Cheng (1991: 130-132) for a similar suggestion based a somewhat broader notion of Economy

We thus reach the conclusion that the MH has to be remodeled so that the above linguistic variations can be accommodated and the conceptual incompatibility reconciled. In the next section, we will show that, with the notion of syntactic predicate and cyclic mapping, it is possible to implement Diesing's original insight in a more productive manner.

1.2. A Dynamic View of Syntax-Semantics Mapping

As our discussion of (3b) and (4a) suggests, the tree-splitting mechanism does not seem to have a global character. That is, the existential closure applying on the upper VP node of (11) and (12) cannot license a subject indefinite in the lower Spec of IP. Consequently, we need to define the domain of existential closure locally, and implement mapping step by step. The problem, therefore, is reduced to how to define a local domain of syntax-semantics mapping, which we will call a "mapping cycle". In light of the above observation, we may introduce the (a) clauses of the EMH:

(7) a. Mapping applies cyclically, and vacuous quantification is checked derivationally.

As a result, (3b) and (4a) are ruled out in the first step of mapping due to vacuous quantification, since the variable introduced by the embedded subject indefinite of (10) and (11) is unbound within the lowest mapping cycle, i.e., the complement IP.

Before we make any further suggestion, it is worth while to note that there is a variety of constructions which display subject specificity in a broader sense, including discourse topic structures, non-restrictive relatives, small clauses, Chinese *ba*-sentences, and various secondary predication structures.⁷ Some of them are exemplified below:

(12) Discourse Topic Structures

A student, [_{IP} Op_i [_{IP} I like t_i very much]].

a. 'A certain student, I like very much.'

b.# 'A nonspecific student, I like very much.'

(13) Non-Restrictive Relative Clauses

A fool, [_{CP} who_i [_{IP} t_i has a big head]], got stuck in the manhole.

a. 'A certain fool, who has a big head, got stuck in the manhole.'

b.# 'A nonspecific fool, who has a big head, got stuck in the manhole.'

(14) Small Clauses

John considers [_{SC} a student [_{AP} stupid]].

a. 'John considers a certain student stupid.'

b.# 'John considers a nonspecific student stupid.'

⁷ For detailed mapping-theoretical analyses of these constructions, see Tsai (1994b).

(15) Secondary Predicates⁸

John is eating an apple_i [_{SC} PRO_i unpeeled].

- a. John is eating a certain apple unpeeled.
- b.# John is eating a nonspecific apple unpeeled.

(12) is a topic-comment structure, where the whole IP counts as a complex predicate with the null operator (semantically a lambda operator) as its open place (cf. Chomsky 1977). In (13), the non-restrictive relative clause, dominated by the CP node, serves as a complex predicate with the relative *wh* as its open place. (14) contains a small clause, where the AP is the relevant predicate. In (15), the small clause as a whole serves as a secondary predicate, taking the matrix object *an apple* as its subject. As noted by Tsai (1994b), all the specificity effects observed throughout (12-15) have something to do with a syntactic predicate, which we tentatively define as an open predicate triggering predication rather than modification (or restriction to the same effect).⁹ Clearly, there is a generalization to be captured here. And the MH seems to be the most promising candidate to employ, except that the relevant categories, i.e., IP, CP, AP and SC, do not meet the mapping criterion for nuclear scope, which requires a VP.

One way to extend the MH along this line of inquiry is to substitute the notion of syntactic predicate for the syntactic category VP in the original formulation, as we have presented in the (b) and (c) clauses of the EMH:

- (7) b. Material from a syntactic predicate is mapped into the nuclear scope of a mapping cycle.
- c. Material from XP immediately dominating the subject chain of a syntactic predicate (excluding that predicate) is mapped outside the nuclear scope of a mapping cycle. A subject chain is an A-chain with its tail in a subject position.

We thus have an explicit notion of mapping cycle, which is defined as the XP immediately dominating the subject chain of a syntactic predicate. Along this move, we would like to propose that existential closure applies to the nuclear scope rather than VP, since it does not participate in scopal interaction, and is only employed as a last resort (see Tsai 1994b for detailed discussion). The proposal is expressed by the (d) clause of the EMH:

- (7) d. Existential closure applies to the nuclear scope of a mapping cycle.

For one thing, it has been pointed out by Percus (1995) that predication structures cannot be identified with adverbial quantificational structures (AQS), who argues that the mapping problem should be centered on the well-formed condition of AQS, while the EMH is responsible only for

⁸ Departing from Tsai (1994b), we follow Percus (1995) in separating (15) from (14), and analyze *unpeeled* as a small clause in itself, where a subject PRO takes *unpeeled* as its predicate. The whole small clause in turn predicates on the matrix object *an apple*, in that PRO serves as a predication variable in William's (1981) sense.

⁹ Here the notion of predication is defined in the spirit of Rothstein (1983):

- (i) XP bears a predication relation to YP if
 - a. XP and YP mutually m-command each other, and
 - b. YP binds an empty argument position in XP.

semantic partition.¹⁰ We may call this a weak version of the EMH. Irene Heim (p.c.) also expresses concern of the same nature: The EMH seems to lose the focus in dealing with the specificity effects exerted by predication, rather than the nature of adverbial quantification, as originally intended by the Heim-Kamp analysis.

First things first, it is indeed our commitment that predication and quantification go hand-in-hand in a cyclic manner. Under this view, which we may call it a strong version of the EMH, syntax-semantics mapping is not only a matter of creating adverbial quantificational structures, but also responsible for ensuring that Fregian composition goes as plotted according to predication structures. In other words, the end of syntax-semantics mapping is the end of a bottom-up style composition. Right or wrong, this theory captures the generalization that whenever predication applies, a nuclear scope is formed, and the subject in question must be licensed in a marked way, e.g., by a [+strong] determiner or by a generic tense. This observation appears to hold whether or not there is an overt adverb of quantification in the relevant mapping cycle. In fact, the strong version can be made compatible with the weak one if we allow a vacuously formed nuclear scope, whose sole purpose is to guarantee the well-formedness of a given predication structure, in that existential closure applies to ensure that there is only one open place per predication.¹¹ There are quite a few desirable consequences following from the strong version of the EMH. One of them concerns a cross-linguistic account of subject specificity effects. We will take on this issue in the next section.

2. A Typology of Verb Movement

First we would like to propose that there is a typological correlation between the lack of V-to-I movement and the lack of nonspecific subject interpretations. The basic intuition here is

¹⁰ The cases entertained by Percus mainly concerns a predication structure embedded within the scope of an adverb of quantification, i.e., an unselective binder in Lewis's (1975) sense. First consider the following example:

- (i) When John is upset, he always eats an apple unpeeled.
 a. # ALWAYS_S [when-upset(s)] ∃_X [eat(John,x,s) & apple(x) & unpeeled(x)]
 b. # ALWAYS_S [when-upset(s)] GEN_X [eat(John,x,s) & apple(x) & unpeeled(x,s)]
 c. ALWAYS_{S,X} [when-upset(s) & eat(John,x,s) & apple(x)] [unpeeled(x,s)]

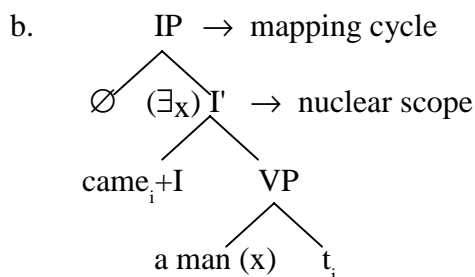
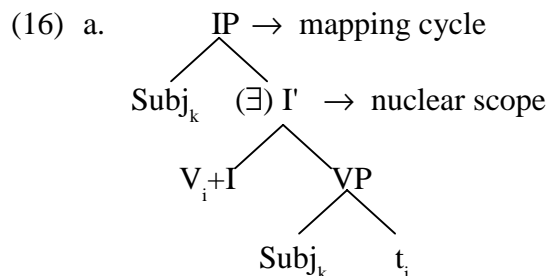
Percus points out that, although the EMH correctly rules out the (a) reading, it wrongly rules in the (b) reading and rules out the (c) reading. First note that a GEN operator is associated with a generic tense. It follows that the unselective binder *always* should be as accessible as the GEN operator in a given IP domain. It is thus unlikely that the GEN operator would be supplied by default to license the variable introduced by *apple* in (i). For this reason, we do not view the (b) reading as a possible interpretation of (i). On the other hand, the EMH does overlook the (c) reading, at least in its original formulation. A tentative treatment comes from Chomsky's (1993) proposal that accusative case is checked in a spec-head configuration, and that an object must raise to Spec of AgroP to check its case feature. As a result, AgroP counts as the XP immediately dominating the subject chain (*apple*, *t*) of secondary predication, as illustrated below:

- (ii) always_x ... [_{AgroP} [an apple(x)]_i ... [_{VP} t_x [_{VP} ... t_i [_{SC} PRO_i unpeeled]]]]

Now suppose that *always* adjoins to VP first and undergoes quantifier raising in LF: Since the trace of *always* is within the local mapping cycle, it seems reasonable to assume that (*always*, *t*) as a whole serves as an unselective binder, licensing the variable introduced by *an apple*. And hence the (c) reading of (i).

¹¹ Of course, this move also calls for a fine-grained morpho-syntactic analysis based on a more elaborate definition of mapping cycle. As far as secondary predication is concerned, its subject should be allowed to access unselective binders such as tense, aspect, and/or adverbs of quantification. See Tsai (1994b) and Percus (1995) for discussions of relevant Chinese and English cases.

straightforward: Since syntax-semantics mapping is taken to involve a dynamic mechanism, we would expect that verb movement extends the domain of a syntactic predicate, and hence the nuclear scope. Consequently, in a V-to-I type language such as English, the domain of a primary predicate, as well as that of the corresponding nuclear scope, is extended from V' to I' in LF (Chomsky 1991).¹² Given the VP-internal subject hypothesis, a subject chain typically has its head above the nuclear scope of the current mapping cycle, as illustrated below:



Its tail, however, is "submerged" under the local nuclear scope, hence subject to existential closure according to (7d). Following Chomsky's (1993) Copy Theory, where chain-formation leaves a copy rather than a trace, we may eliminate the lowering mechanism without losing Diesing's original insight: If the lower copy in Spec of VP is deleted, the upper copy in Spec of IP must get strongly quantified, either by its own determiner or by a sentential operator such as an adverb of quantification. This is because existential closure is not available at this altitude. In the case of the English sentence (1), it is the [+strong] determiner *a* that licenses the head noun *man*, resulting in the specific reading (1a). On the other hand, if the upper copy is deleted, the lower copy in Spec of VP is within the local nuclear scope. It is therefore subject to the existential closure on I'. The nonspecific reading of (1b) can then be derived, as illustrated by (16b).¹³

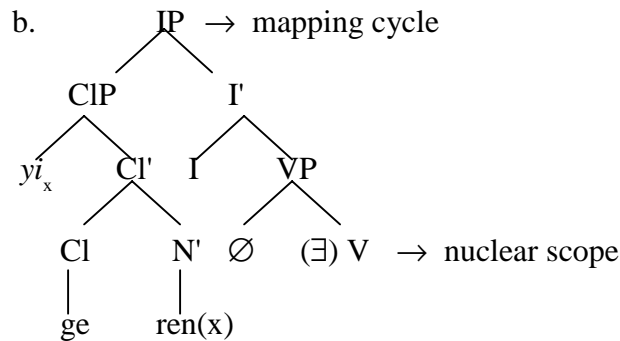
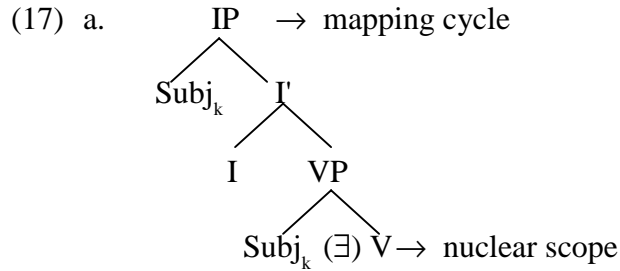
In contrast, Chinese-type languages lack agreement morphology, and do not license V-to-I raising. As a result, a subject chain is typically outside of nuclear scope, and cannot be blessed by existential closure. as visualized in the following diagram:

¹² Here we conveniently take I(nfl) to represent a collection of functional heads in sentential projections, and the "split" version of IP in Pollock's (1989) sense will be employed wherever it is relevant to our discussion.

¹³ As a reviewer observes, even when a lexical auxiliary is present, as is the case with (i), we have to assume that V-to-I raising applies in LF:

(i) A man has come yesterday.

Otherwise, we would wrongly predict that (i) does not allow a nonspecific reading.



The situation is compounded by the lack of [+strong] numeral specifiers in Chinese (probably with the exception of the singular numeral *yi* 'one', cf. Table 1). (4a) is thus ruled out due to vacuous quantification. (4b), nevertheless, is considered acceptable by some speakers, for whom *yi* counts [\pm strong] and therefore qualified as a licenser of *ren* 'person', as illustrated by (17b).¹⁴ Note that even for speakers who accept (4b), a cardinal (nonspecific) reading is never an option for the subject indefinite *yi-ge ren* 'a person'. We thus account for the general impression that Chinese does not allow cardinal subjects.

On the other hand, raising to a light verb is quite common in Chinese. The most solid case comes from a variety of syntax-semantics mismatches discussed in Huang (1994, 1997):

- (18) a. na-zhen feng leng-si wo le.
 that-Cl wind cold-dead I Inc
 'That wind just made me cold to death.'
- b. na-zuo jianyu pao-le liang-ge ren.
 that-Cl prison run-Prf two-Cl person
 'There ran away two people from the prison.'

¹⁴ A clearer example for the position-sensitive construals can be found in Chinese object shift. As illustrated by the contrast between (ia) and (ib), bare NPs is interpreted as nonspecific in situ, whereas the reading is definite when it shifts to a preverbal focus position:

- (i) a. Akiu chi-guo dongxi le.
 Akiu eat-Exp thing Inc
 'Akiu has eaten something.' (nonspecific reading)
 b. Akiu dongxi chi-guo le.
 Akiu thing eat-Exp Inc
 'Akiu has eaten the thing.' (definite reading)

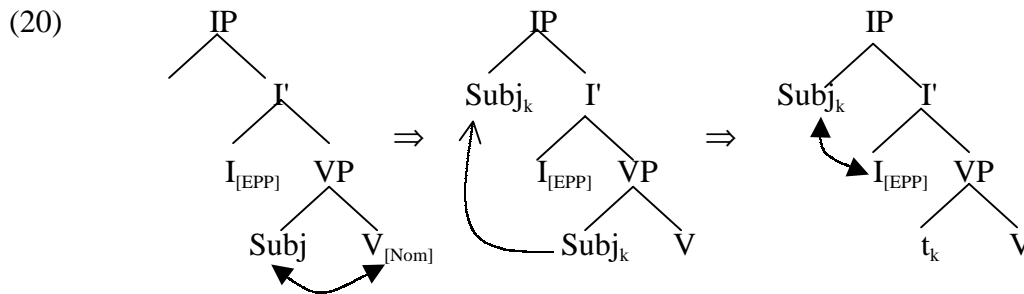
- c. ni du nide shu, bu yao guan wo.
 you read your book not need mind I
 'You do your reading, and don't mind me.'

All the above three sentences cannot be interpreted on their surface values. As noted by Huang, they involve eventuality predicates of some sort, each of which corresponds to an implicit light verb, i.e., CAUSE, OCCUR, or DO, as illustrated by (19a-c) respectively:

- (19) a. na-zhen feng CAUSE+[leng-si]_k wo t_k le.
 that-CL wind cold-dead I Inc
- b. na-zuo jianyu OCCUR+[pao-le]_k liang-ge ren t_k.
 that-CL prison run-Prf two-CL person
- c. ni DO+du_k [_{Gerrund} nide t_k shu].
 you read your book

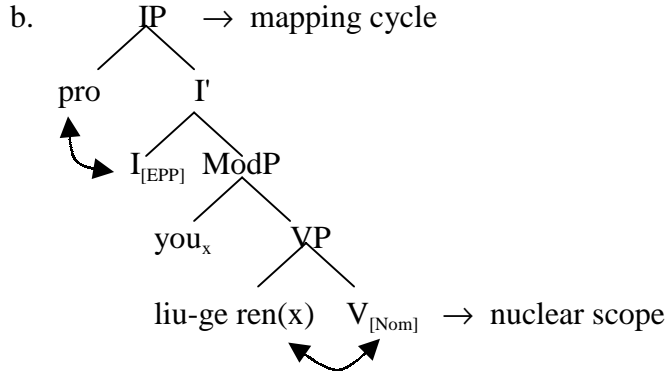
In all the three cases, the main predicate consists of an implicit light verb adjoined by the head verb of its complement: a resultant state in (19a), an occurring event in (19b), and a gerund in (19c).

The question remains as to how Chinese subjects get their nominative case checked if there is no V-to-I raising in LF. One way to look at this issue is to adopt the view that nominative case should be teased apart from the feature responsible for the EPP effects (Branigan 1993, Collins 1997). In light of this move, we would like to suggest that nominative case is realized on V, and get checked off in situ against the subject in Spec of VP, as illustrated by the first step of (20):



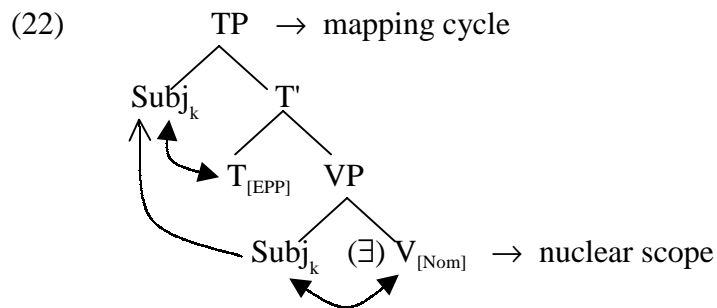
The subject in question then raises to Spec of IP to check the EPP feature (a strong D feature in Chomsky's 1995 terms) on I, as shown by the second step of (20). This proposal is independently motivated by the existential constructions headed by *you* 'have' such as (21a):

- (21) a. you liu-ge ren lai-le.
 have six-CL person arrive-Prf
 'There are six people who have arrived.'



Here the existential predicate *you* serves as an unselective binder of the numeral subject in Spec of VP. In the vein of Huang (1988) and Cheng (1991), we analyze *you* as the head of a modal projection which takes VP as its complement, as illustrated by (21b). In this configuration, nominative case checking must be done VP-internally, while the EPP feature on I is checked off by an empty expletive in Spec of IP (cf. Huang 1987, Huang et al. 1998). Similar conclusions have been reached for inversion and unaccusative structures in other pro-drop languages such as Japanese (Yatsushiro 1996) and Italian (Pinto 1997). It is therefore safe to assume that, in Chinese, nominative case are uniformly checked in Spec of VP for both transitive and unaccusative constructions. The difference is that the former involves subject raising to fulfill the EPP, while the latter employs the empty expletive strategy.¹⁵

Another important aspect of our theory concerns its prediction about Dutch, a language riddled with rich inflectional morphology. As far as the distribution of cardinal subjects is concerned, Dutch unaccusative constructions pattern with Chinese (cf. (3) and (4)), while its transitive constructions pattern with English (cf. (1) and (5)). Here we would like to pursue Reuland & Kosmeijer's (1987) intuition that inflectional features are realized on V in Dutch. The idea is that unaccusative verbs do not move to a higher functional head in non-V2 clauses, not only because there is no accusative case to check, but also because nominative case is realized on V instead of I. As a result, nominative case is checked off in situ, as illustrated below:



Here we hold the view that a category does not project trivially, in the spirit of Chomsky (1994). Since the unaccusative verb of (3a,b) has only one THEME argument, it projects directly to VP,

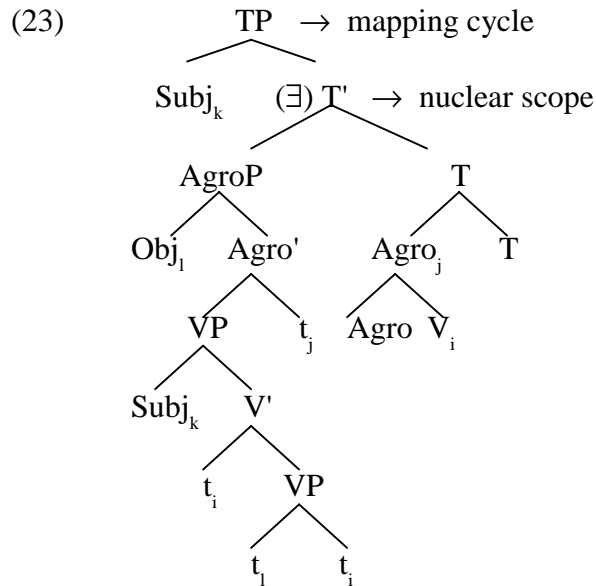
¹⁵ This way, we also maintain Huang's (1993) argument for the internal subject hypothesis, who has argued quite forcefully that constituents undergoing VP-fronting contain a subject trace: Since all of the examples discussed there are transitive in nature, it is fully expected that the trace in question resides in Spec of VP, and carries the index of the local subject.

and counts as a syntactic predicate by itself, which is in turn mapped to the nuclear scope according to the EMH. The subject then raises to Spec of IP to check the EPP feature. The subject chain is therefore outside of the nuclear scope. As a result, only an indefinite with a [+strong] cardinal determiners. We therefore have a straightforward account for the contrast between (3a,b). It is in this respect that Dutch and Chinese pattern together except for the lexical idiosyncrasies of their numeral specifiers.

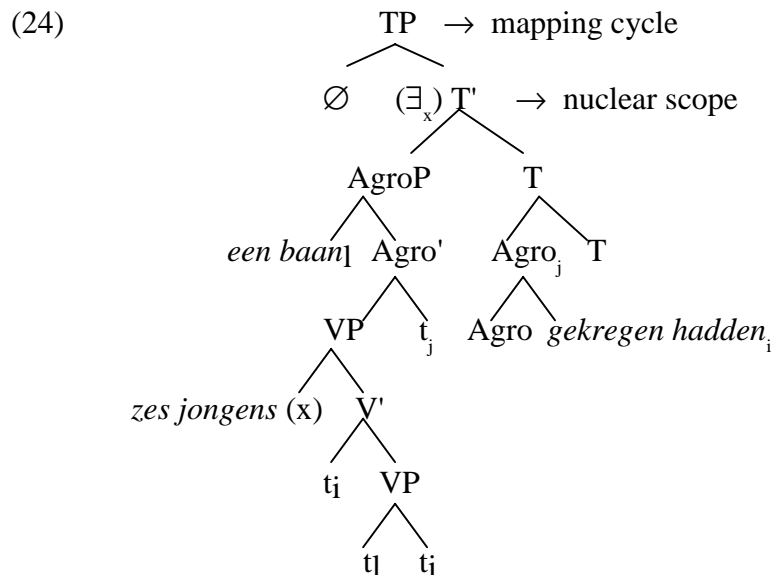
Transitive constructions, on the other hand, are a different story. First note that Dutch is classified as an overt Object Shift language, where overt V-to-I raising is ensured for transitive verbs such as *gekregen* 'got' and *geslagen* 'hit' of (5a,b) (cf. Holmberg 1986, Bures 1992, 1993, Bobaljik & Jonas 1996, among others):

- (5) a. Judy dacht dat zes jongens een baan gekregen hadden.
 Judy thought that six boys a job got had
 'Judy thought that six boys had got a job.' (specific, nonspecific)
- b. Judy dacht dat een man die hond geslagen hadden.
 Judy thought that a man the dog hit had
 'Judy thought that a man had hit the dog.' (*specific, nonspecific)

Following Bobaljik & Jonas (1996), we would like to suggest that the indefinite subjects of (5a,b) are hosted by Spec of TP, which is in turn licensed by overt Object Shift. Consequently, we have a mapping geometry akin to the English LF (16b):



That is, while the head of the subject chain is above the local nuclear scope and the domain of existential closure, the tail is not. This gives rise to the nonspecific interpretations of (5a) when the upper copy is deleted, as illustrated by the following diagram:



To sum up, by employing the cyclic mapping mechanism, we not only capture the unlikely alignments among Chinese, Dutch, and English with respect to the distribution of cardinal subjects, but also reconcile the discrepancy between Diesing's IP-VP dichotomy and Bobaljik & Jonas's [Spec, TP] parameter, in that the domain of nuclear scope is extended along verb raising, and a VP-external subject is in principle eligible for existential closure.

3. Mapping Geometry of Chinese Modality Sentences

3.1. Cardinal Subjects in a V-to-V Type Language

It is widely observed that Chinese (plural) numeral indefinites cannot appear as subjects without being licensed by *you* 'have/exist', an existential modal verb triggering specific reading, as evidenced by the contrast between (25a,b):

- (25) a. *you* *liang-ge ren* *yiqian jian-guo* *Akiu*.
 exist two-Cl person before meet-Exp Akiu
 'There are two people who met Akiu before.' (specific, *nonspecific)
- b.* *liang-ge ren* *yiqian jian-guo* *Akiu*.
 two-Cl person before meet-Exp Akiu
 'Two (nonspecific) people met Akiu before.'

The above observation, however, is not entirely true: Modality sentences, as well as some non-root clauses, do allow numeral indefinites to appear without the escort of *you*, expressing cardinality or quantity (see also Lee 1986, Li 1996). In this paper, we focus on the following four types of modality construction, as they are most relevant to the head movement typology discussed here:¹⁶

¹⁶ Audrey Li (1996) points out a range of interesting facts which do not quite fall under the EMH. They can be divided

(26) V-de-V/V-bu-V Constructions

wu-ge ren chi-de-wan/chi-bu-wan shi-wan fan.
five-Cl person eat-can-finish/eat-cannot-finish ten-Cl rice
'Five people can/cannot finish ten bowls of rice.'

(27) Modal Constructions

san-ge bu-bing keyi/neng/yinggai/bixu dai jiu-fen kouliang.
three-Cl foot-soldier may/can/should/must carry nine-Cl ration
'Three foot soldiers may/can/should/must carry nine rations.'

(28) Flip-flop Constructions

- a. liu-ge ren shui liang-zhang chuang.
six-Cl person sleep-in two-Cl bed
'Six people should/may sleep in two beds.'
- b. liang-zhang chuang shui liu-ge ren.
two-Cl bed sleep-in six-Cl person.
'Two beds should/may hold six people in sleeping.'

(29) *Gou*-Constructions

into three groups: One contains sentences headed by individual-level predicates such as *yonggan* 'brave', which is relatively unproblematic since they are generally taken to involve a control structure (see also section 3.6). The second group consists of sentences like (i):

- (i) *san-ge xuesheng (yinggai) qu kan Wang laoshi.
three-Cl student should go visit Wang teacher

Here the addition of the deontic modal *yinggai* 'should' does nothing to rescue the cardinal subject. But when we pick the right modal conforming to the context, the sentence improves:

- (ii) san-ge xuesheng keyi qu kan Wang laoshi. zaiduo jiu bu hao le.
three-Cl student may go visit Wang teacher more-than-that then no good Inc
'Three students may visit Professor Wang. More than that would be inappropriate.'

The final group contains modality sentences which do not license cardinal subjects:

- (iii) *wu-ge xuesheng zuo-de-wan gongke.
five-Cl student do-can-finish homework

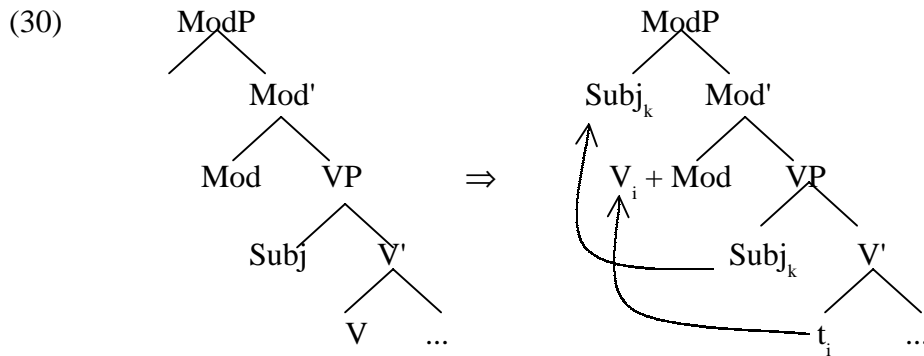
The curious thing here is that when we make the object NP definite to avoid the compound reading, (iii) improves considerably:

- (iv) wu-ge xuesheng zuo-de-wan zhexie gongke.
five-Cl student do-can-finish these homework

Here the point is not that we can find exceptions to exceptions, and thereby cancel out the counterargument, but that there are a lot of factors lying around which have not yet been thoroughly examined and formally represented: Some of them may not be syntactic in nature. In this sense, Li is quite right to object to the claim that cardinal subjects are licensed by modals, which, for one thing, is not what the EMH say anyway. The EMH provides a way to assign cardinality to subject indefinites when the required configuration is met, and if a cardinal subject licensed this way cannot get along with a particular type of predicate, it should follow from a lexical semantics of cardinality rather than the EMH. In fact, the EMH can be made compatible with Li's observation on the assumption that existential closure is a prerequisite for cardinality, which in turn provides a formal basis for the amount and quantity interpretations.

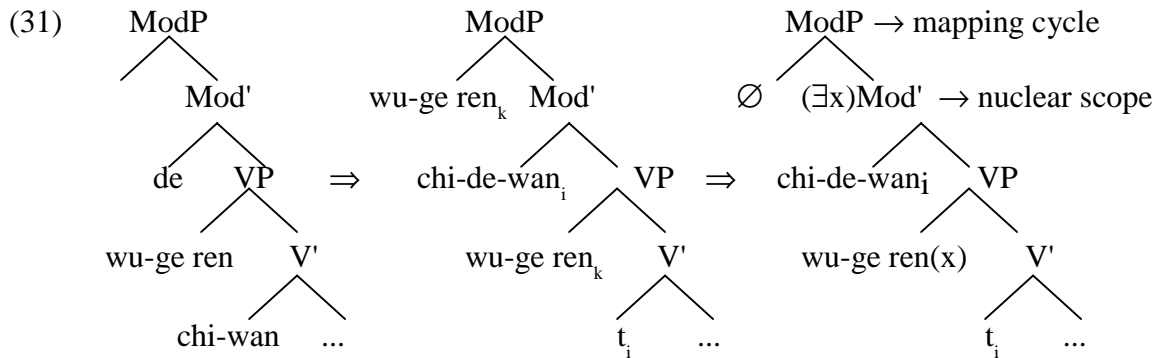
- a. liang-zhang chuang gou shui liu-ge ren.
 two-Cl bed enough sleep-in six-Cl person
 'Two beds are enough for six people to sleep in.'
- b. liang-zhang chuang gou liu-ge ren shui.
 two-Cl bed enough six-Cl person sleep-in
 'Two beds are enough for six people to sleep in.'

Picking up the thread of our inquiry in the last section, we would like to entertain the possibility that all the four types of modality construction involve V-to-Mod raising, overtly or not, creating the now familiar configuration which licenses cardinal subjects:



3.2. V-de -V and V-bu -V Constructions

The V-de-V construction (26a) and the V-bu-V construction (26b) provide clear-cut cases of V-to-Mod movement.¹⁷ Take (26a) for example: *wu-ge ren* 'five people' moves into Spec of ModP, forming a chain and leaving a copy in Spec of VP, while the verb complex *chi-wan* 'eat-finish' raises to wrap around the infixal modal *-de-*:



¹⁷ Mei (1987:27) points out that the modal-verb complex in question cannot occur within VP, and therefore must locate in a higher projection, as evidenced by (i):

(i) * ta [_{VP} ba yi-kai da shitou ban-de/bu-dong].
 s/he BA one-Cl big stone lift-can/cannot-move

The lower subject copy is deleted at PF under identity, deriving the surface form of (26a). At LF, if the upper copy is deleted and the lower copy is mapped into the nuclear scope, the subject variable in Spec of VP is licensed by existential closure, as in (31). The nonspecific reading of (26) is thus accounted for. In contrast, if the lower copy is deleted at LF, the upper copy is mapped outside of the nuclear scope with respect to (7b), where the licensing from existential closure is unavailable. Since the numeral specifier *wu-ge* 'five-Cl' is [-strong], the subject variable in Spec of ModP cannot be bound within the local mapping cycle, resulting in vacuous quantification according to (7d). The semantics of (26) is thus in order:

- (32) $\diamond \text{GEN}_s [s \text{ is a situation}] \exists_{x,y} (x \text{ is a group of five people in } s \ \& \ y \text{ is a group of ten bowls of rice in } s \ \& \ x \text{ finishes } y \text{ in } s)$

Here the generic operator GEN ranges over typical situations, introduced under the possibility modal to account for the free-choice *any* reading of (26).

Things becomes even more interesting once we add an existential modal *you* 'have' in the sentence-initial position:

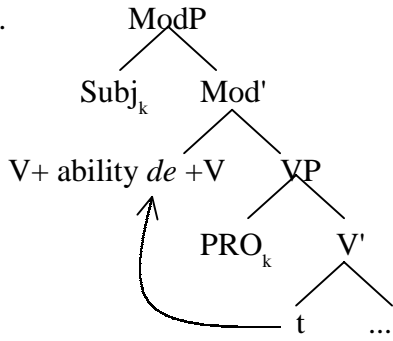
- (33) you wu-ge ren chi-de-wan shi-wan fan.
 have five-Cl person eat-can-finish ten-Cl rice
 a. 'There is a group of five people such that it is possible for them to finish ten bowls of rice.' (possibility modality: collective reading \rightarrow total capacity: 10 bowls)
 b. 'There are five people such that it is possible for each of them to finish ten bowls of rice.' (possibility modality: distributive reading \rightarrow total capacity: 50 bowls)
 c. 'There are five people each of whom is able to finish ten bowls of rice.'
 (ability modality: distributive reading only \rightarrow total capacity: 50 bowls)

The presence of *you* in (33) licenses the three specific interpretations (33a,b,c) (vs. the nonspecific readings of (26a)). With appropriate contexts and predicates, it is possible to tease apart the possibility and ability readings (data due to Tzong-Hong Lin p.c.):

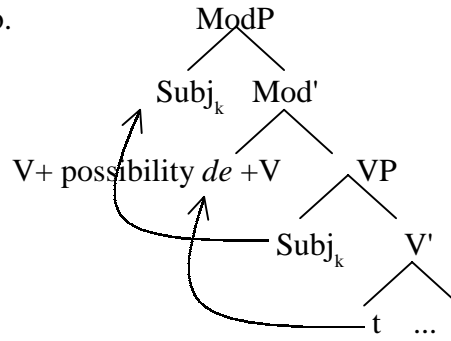
- (34) a. you wu-ge ren qu-de-liao/qu-bu-liao Taiwan.
 have five-Cl people go-can-finish/go-cannot-finish Taiwan
 'There are five people such that it is possible/impossible for them to go to Taiwan.'
 b. you wu-ge ren pa-de-shang/pa-bu-shang Yu Shan.
 have five-Cl people climb-can-up/climb-cannot-up Yu Mountain
 'There are five people each of whom is able/unable to climb Yu Mountain.'

The possibility reading is prominent in (34a), while the ability reading is prominent in (34b). Here we propose to attribute the ambiguity in question to a structural distinction between control and raising modals, as illustrated in (35a) and (35b) respectively:

(35) a.

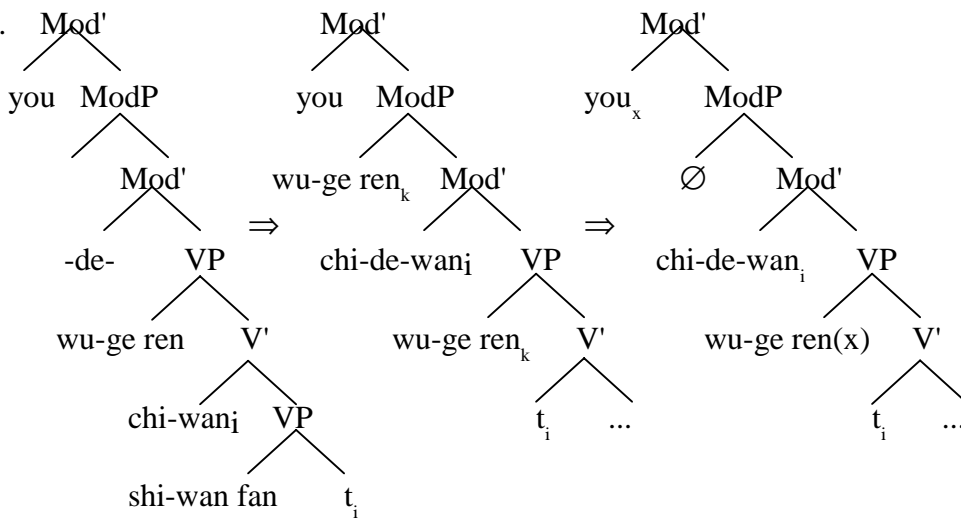


b.

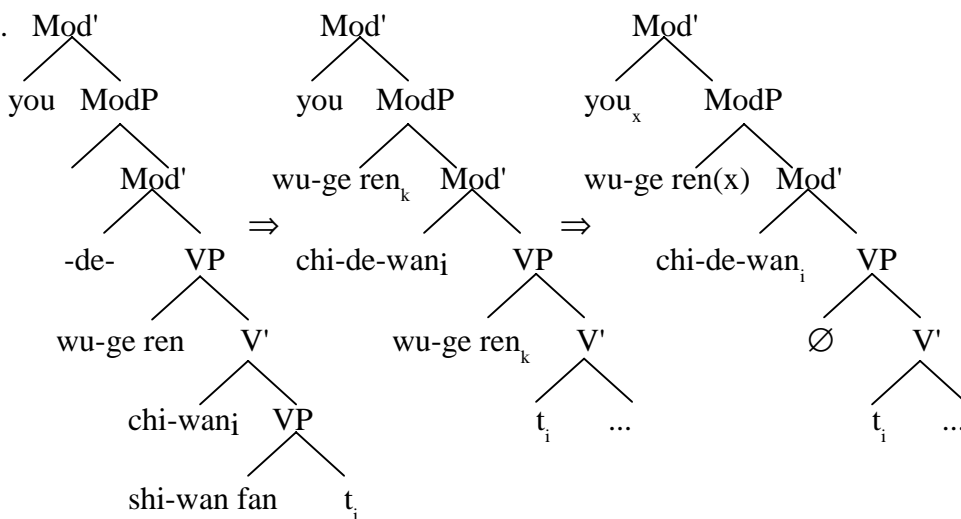


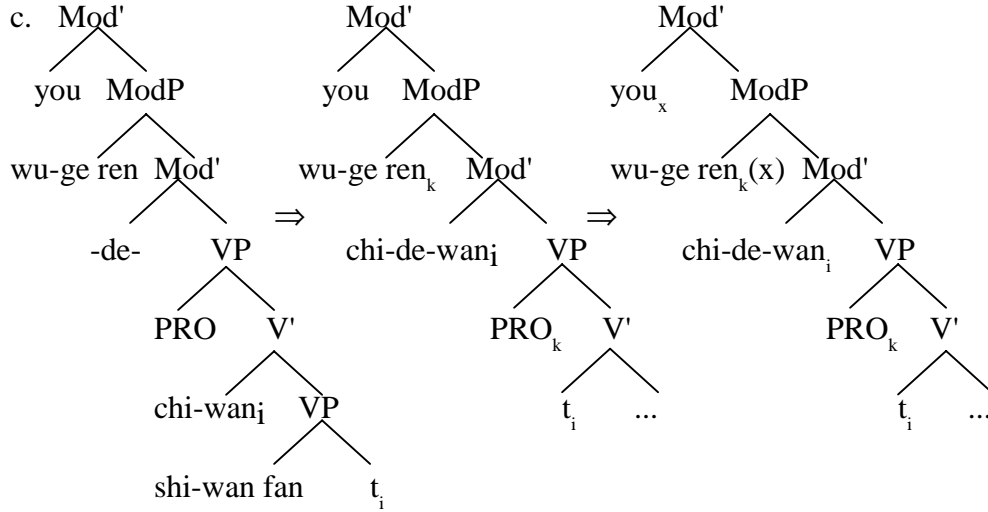
Control modals like ability *neng* 'can', volition *hui* 'will', *gan* 'dare', and *xiang* 'want' bear thematic relations to their subjects, whereas raising modals like possibility *neng* 'can', future *hui* 'will', *bixu* 'must', and *yinggai* 'should' do not (cf. Huang 1988, Lin & Tang 1995). It follows that there are three logically possible derivations, each of which corresponding to one of the reading of (33):

(36) a.

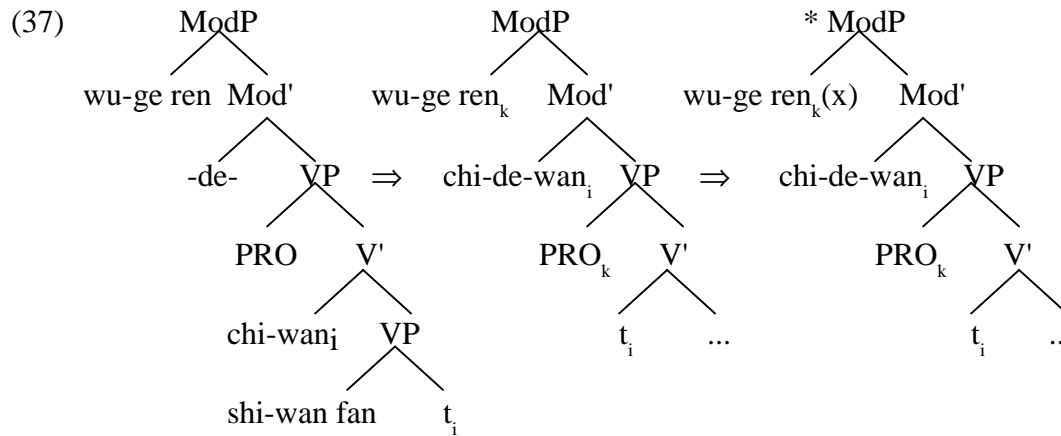


b.





One problem remains to be tackled: Why does (26) allow only a collective interpretation? The answer is straightforward under our approach. As illustrated by (37), since ability *-de-* is thematically related to its subject *wu-ge-ren* 'five people', the subject is base-generated in Spec of ModP, and Spec of VP is filled by PRO:



Consequently, the numeral indefinite is outside the local nuclear scope, which means that the variable introduced is beyond the scope of existential closure. Since the existential modal *you* 'have' is not available there, the unbound variable in Spec of ModP results in vacuous quantification. The ability-distributive reading is thus ruled out for (26).

In contrast, possibility *-de-* has the subject in Spec of VP, and raises it to Spec of ModP subsequently: If the lower copy is deleted, the derivation is ruled out due to vacuous quantification. The possibility-distributive reading is therefore unavailable. But if the upper copy is deleted, the lower copy is scoped over by the modal-verb complex and licensed by the existential closure on Mod'. As a result, only the possibility-collective reading survives for (26).

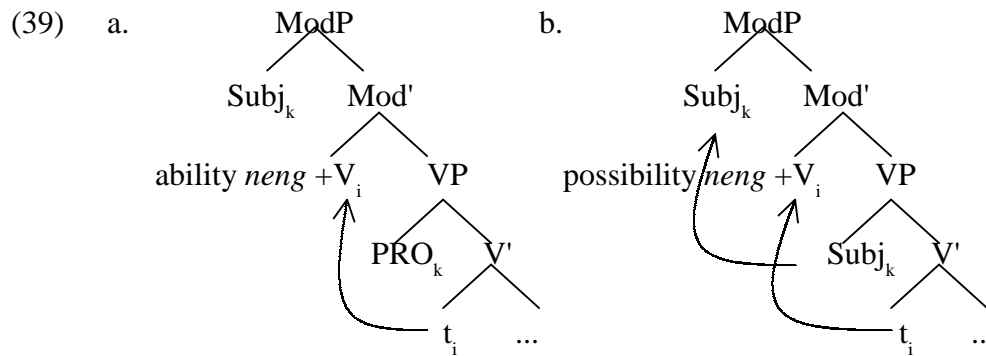
3.3. Modal Constructions

The same analysis applies to (27) once we adopt the view that V undergoes LF movement to Mod

in ordinary modal constructions, as shown below:

- (38) you san-ge bu-bing neng dai jiu-fen kouliang.
 have three-Cl foot-soldier can carry nine-Cl ration
 a. There is a group of three foot soldiers such that it is possible for them to carry nine rations.
 b. There are three foot soldiers such that it is possible for each of them to carry nine rations.
 c. There are three foot soldiers each of whom is able to carry nine rations.

The ability-distributive reading need existential *you* to survive, as in the case with (33c), as illustrated by (39a):



Again, we distinguish the ability reading and the possibility reading based on the contrasts between (40a) and (40b):

- (40) a. ming nian you wu-ge ren neng xiu-jia.
 next year have five-Cl people can go-on-vacation
 'There are five people such that it is possible for them to go on vacation next year.'
- b. you wu-ge ren neng kai qiche.
 have five-Cl people can drive car
 'There are five people who have the ability to drive.'

The possibility reading is prominent for the former, whereas the ability reading is prominent for the latter. Our position is further strengthened by the fact that once we substitute typical control modals for the raising modals in (27), the sentence becomes ungrammatical, as evidenced by (41):

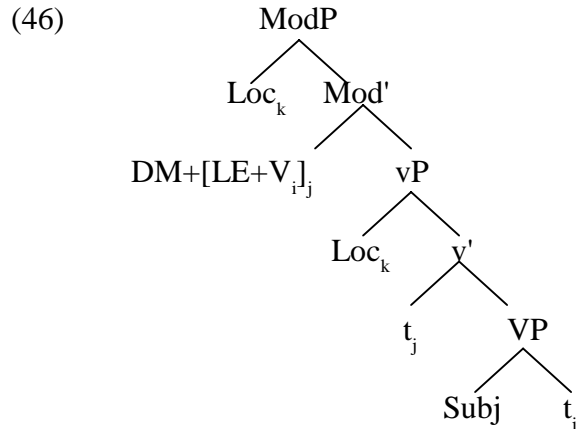
- (41) * san-ge bu-bing gan/ken/xiang dai jiu-fen kouliang.
 three-Cl foot-soldier dare/willing/want carry nine-Cl ration
 'Three foot soldiers dare/are willing to/want to carry nine rations.'

This is because, with a PRO in Spec of VP, the numeral subject indefinite can no longer be licensed by existential closure. Since there is no licenser outside of nuclear scope either, (41) is ruled out in violation of vacuous quantification, as illustrated by the following derivations:

(28b), on the other hand, appears to a variant of Chinese locative-existential constructions, and can be paraphrased as follows:

- (45) liang-zhang chuangkeyi you liu-ge ren shui.
 two-Cl bed may exist six-Cl person sleep-in
 'Two beds may have six people to sleep in.'

Therefore, we postulate two implicit heads for (28b), each of which corresponds to *keyi* 'may' and *you* 'have/exist' respectively (LE: locative-existential light verb; vP: light verb phrase):



Now we can get the EMH working to derive the semantic representation of (28b), as sketched below:¹⁸

¹⁸ For one thing, the collective-distributive ambiguity emerges again in presence of *you* 'have':

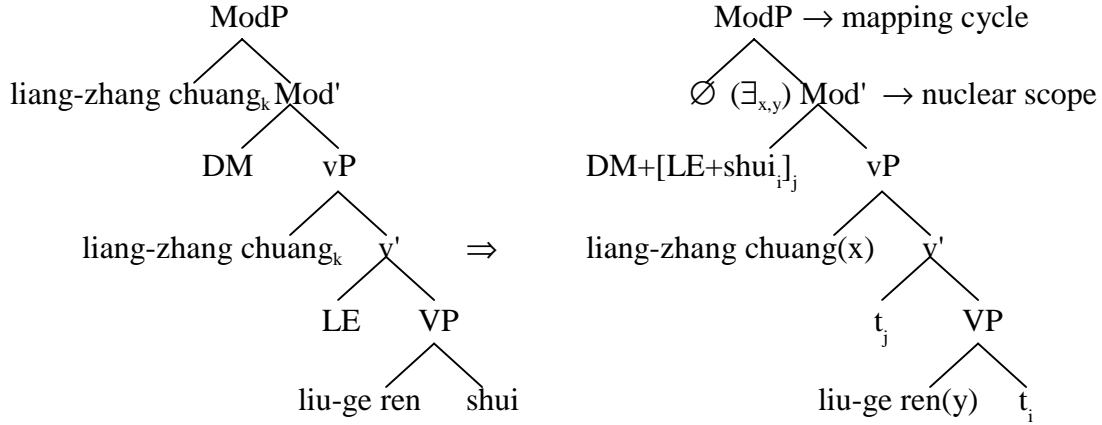
- (i) you liu-ge ren shui liang-zhang chuang.
 have six-Cl person sleep-in two-Cl bed
 a. 'There are six people who sleep in two beds.'
 b. 'There are six people each of whom sleeps in two beds.'
- (ii) you liang-zhang chuang shui liu-ge ren.
 have two-Cl bed sleep-in six-Cl person
 a. 'There are two beds which collectively hold six people in sleeping.'
 b. 'There are two beds each of which holds six people in sleeping.'

Here the reading is factive, and the flavor of deontic modality somehow disappears. Consequently, the scope interaction approach developed so far does not apply here. What seems responsible here is the general property of a plural subject (Link 1983), which, depending on the type of predicate, can be either collective or distributive. Therefore, the ambiguity in question patterns with that of (iii):

- (iii) you san-ge ren chi-le jiu-wan fan.
 have three-Cl person eat-Prf nine-bowl rice
 a. 'There are three people who collectively ate nine bowls of rice.'
 b. 'There are three people each of whom ate nine bowls of rice.'

Since the issue is beyond the scope of this paper, we will not attempt an explicit treatment here.

(47)



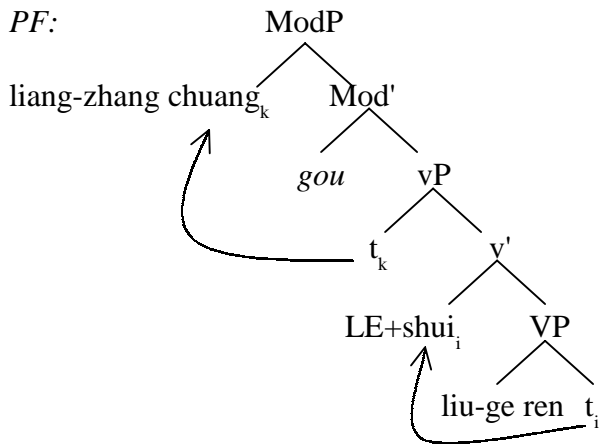
3.5. *Gou*-Constructions

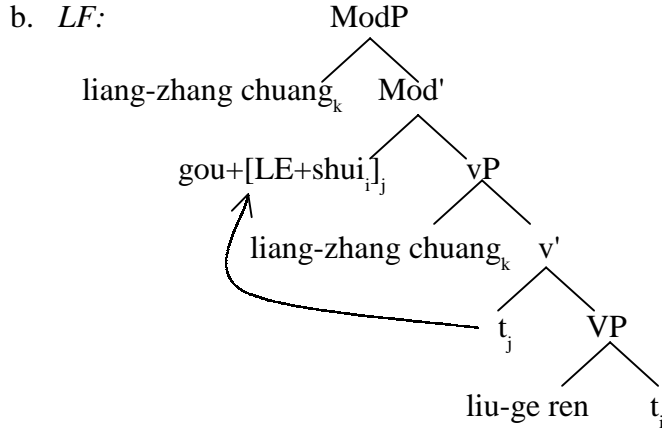
As a verb, *gou* 'enough' expresses a measurement of adequate degree or quantity, and behaves rather like a one-place predicate taking a clausal argument, as evidenced by (48a,b):

- (48) a. [_{CP} liang-zhang chuangshui liu-ge ren] gou-le.
 two-Cl bed sleep-in six-Cl person enough-Inc
 'It is enough for two beds to hold six people in sleeping.'
- b. [_{CP} liang-zhang chuangliu-ge ren shui] gou-le.
 two-Cl bed six-Cl person sleep-in enough-Inc
 'It is enough for two beds to hold six people in sleeping.'

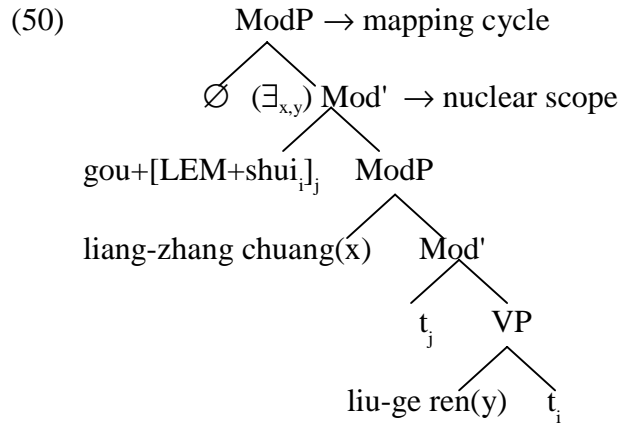
Argument structures of this sort are a prerequisite for a raising construction. Furthermore, the adequacy criterion in question is contextually determined, which qualifies *gou* as a modal on semantic grounds. These observations together lead us to the conclusion that *gou* should be analyzed as a raising modal in (29a,b). Along this line, we may visualize the PF and LF representations of (29a) as follows:

(49) a. PF:





When syntax-semantics mapping applies, if the lower subject copy is deleted in (49b), we again have a case of vacuous quantification. If the upper copy is deleted, both the subject and the object are licensed by existential closure on Mod', as illustrated in the diagram below:



(29b) has exactly the same syntax and semantics of (29a) except that its main verb *shui* 'sleep in' undergoes head movement in LF rather than in syntax.¹⁹

¹⁹ Problems arise when the existential modal *you* is introduced: Namely, only the distributive reading is available in either type of *gou*-constructions, as exemplified by (i) and (ii):

- (i) you liang-zhang chuang_k gou t_k shui liu-ge ren.
 have two-Cl bed enough sleep-in six-Cl person
 a. #'There are two beds which together are enough for six people to sleep in.'
 b. 'There are two beds each of which is enough for six people to sleep in.'

- (ii) you liang-zhang chuang_k gou t_k liu-ge ren shui.
 have two-Cl bed enough three-Cl person sleep-in
 a. #'There are two beds which together are enough for six people to sleep in.'
 b. 'There are two beds each of which is enough for six people to sleep in.'

One way to approach the problem is to suggest that *gou* is actually a matrix predicate: Since existential quantification is clause-bound, only the upper copy of the subject chain is licensed. Hence the distributive readings of (i) and (ii). This treatment is independently motivated by constructions headed by *kanqilai* 'seem', a typical raising verb:

- (iii) you san-liang che_k kanqilai t_k zuo-le wu-ge ren.
 have three-Cl car seem sit-Prf nine-Cl person
 a. #'There are three cars which seem to have held five people in sitting.'
 b. 'There are three cars each of which seems to have held five people in sitting.'

3.6. Some Residue Issues

A reviewer notes that conditional and passive constructions also license nonspecific subjects in Chinese (also cf. Lee 1986). First take (51) for instance:

- (51) *ruguo yi-ge ren zhong-le caipiao, ta hui hen fuyou.*
 if one-Cl person win-Prf lottery s/he will very rich
 'If a person has won a lottery, s/he will become very rich.' (*specific, nonspecific)

Here the numeral indefinite can only be construed as nonspecific. For one thing, it is also the case that conditionals license indefinite *wh*'s, as evidenced by (52):

- (52) *ruguo shei zhong-le caipiao, ta hui hen fuyou.*
 if who win-Prf lottery s/he will very rich
 'If someone has won a lottery, s/he will become very rich.'

Therefore, it seems reasonable to suggest that *ruguo* 'if' licenses a sentential existential closure just like other polarity triggers (e.g., negation, A-not-A questions, etc.) do in Chinese. On the other hand, since the non-root conditional clause involves an intensional context, the specific construal is blocked. Hence the obligatory nonspecific reading of (51). Next consider the passive construction (53):

- (53) [*ershiliu-wei xuesheng*]_k *bei song t_k dao Shanghai non-xueyuan.*
 twenty six-Cl student by send reach Shanghai agriculture-college
 'Twenty six excellent students have been sent to a Shanghai agriculture college.'

The reason (53) is good has little to do with modality or verb movement. It is the tail of the A-chain that is at work here: If the lower copy is deleted, the derivation crashes due to vacuous quantification (recall that plural cardinal determiners are [-strong] in Chinese). If it is the upper copy that gets deleted, the lower copy is then licensed by existential closure associated with the nuclear scope, resulting in the nonspecific reading of (53).

As noted by another reviewer, our theory predicts that individual-level predicates like *dong* 'understand' should not allow a nonspecific subject, since they involve a control structure akin to (35a) (Diesing 1992, Kratzer 1995). This is indeed the case, as evidenced by the deviance of (54):

- (54) * *san-ge ren_k [_{VP} PRO_k dong yingyu].*
 three-Cl person understand English
 'Three people understand English.'

More importantly, the sentence cannot be improved by adding a raising modal such as *keyi* 'may' and *yinggai* 'should':

- (55) * *san-ge ren_k keyi/yinggai [_{VP} PRO_k dong yingyu].*
 three-Cl person may/should understand English

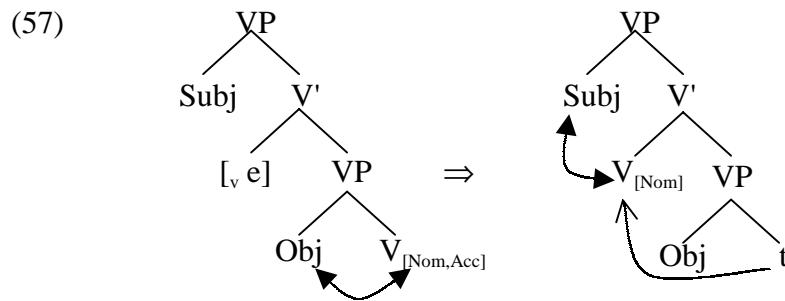
Here the only reading available is distributive, indicating it is the upper copy of the subject chain that gets existentially quantified.

'Three people understand English.'

The reason is that Spec of VP is filled by a PRO rather than by a subject trace/copy. Since the subject indefinite can be licensed neither by existential closure nor by a lexical operator like *you* 'have', (55) is ruled out due to vacuous quantification. Another prediction is that verbs with a CP complement cannot take a nonspecific subject, as there is no need for accusative case-checking. This is again borne out, but for a different kind of reason:

- (56) * Akiu yiwei liu-ge nanhai yaoqiu [CP zhengfu tigong xin gongzuo]
 Akiu think six-Cl boy require government provide new job
 'Akiu thought six boys required that the government provide new jobs.'

It has been established by Tsai (1995) that Chinese CP arguments can and must be case-marked, since they have the same distribution as NPs, and lack so-called case resistance effects (Stowell 1981). Moreover, since Chinese does not project AgroP due to the lack of agreement, accusative case is checked in Spec of VP uniformly for both CP and NP complements, following by V-to-V raising and nominative case checking, as illustrated below:



(56) is therefore as bad as (58):

- (58) * Akiu yiwei liu-ge nanhai yaoqiu [NP xin gongzuo]
 Akiu think six-Cl boy require new job
 'Akiu thought six boys required new jobs.'

Consequently, there is no case theoretic motivation for V-to-I raising, and (56) and (57) are again ruled out due to vacuous quantification on the part of the embedded subject.

4. Concluding Remarks

This paper distinguishes two types of language, V-to-I type vs. V-to-V type, with a view to deriving two distinct patterns of associating (non-)specific interpretations with subject positions. In the former type, verbs move to a higher functional head, either overtly or covertly, and nonspecific numeral indefinites may appear in Spec of IP at S-structure, as is the case with English, where cardinal subjects are a commonplace. In the latter type, verbs do not move to a higher functional head, and nonspecific numeral indefinites cannot appear in Spec of IP at S-structure, as is the case with Chinese, where cardinal subjects are relatively rare. With the Copy Theory and the

Extended Mapping Hypothesis, we account for the asymmetry between these two types of language type in terms of their distinct mapping geometries.

Furthermore, Dutch proves to be an interesting case to examine with respect to this typology: Transitive constructions pattern with English type languages, whereas unergative and unaccusative constructions pattern with Chinese type languages. We demonstrate that, under the EMH, this asymmetry follows directly from Holmberg's (1986) generalization, since Dutch count as an Object Shift language.

Finally, we show that even with a typical V-to-V type language, cardinal subjects can still be found in modality sentences, where verb-to-modal raising arguably takes place in both Syntax and LF, and the Mod' node is mapped into the local nuclear scope. Consequently, subject copies interpreted in Spec of ModP are ruled out due to vacuous quantification, while subject copies in Spec of VP are licensed by existential closure, resulting in the nonspecific reading in question.

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