Pure syntax and Interfaces: overt and covert arguments in L2 Chinese

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L2 acquisiton: non-convergence

- Convergence on the target grammar is not guaranteed in L2 acquisition.

- The lack of positive evidence may result in the divergence between the L2 grammar and the target grammar.

- The divergence between the L2 grammar and the target grammar may concentrate on functional categories, functional features or more specifically, the uninterpretable functional features that are not activated in L2 learners' L1 grammar (Hawkins 2005; Hawkins and Chan 1996; Hawkins and Hattori 2006; Tsimpli 2003; Tsimpli and Dimitrakopoulou 2007).

Interface Hypothesis

- Sorace (2005) notes that the divergent aspects of L2 grammars tend to be found at the interface between syntax and other cognitive systems, such as the lexicon, discourse or pragmatics. On the other hand, L2 learners do not have any trouble acquiring categories that are internal to the computational system of syntax proper.

- This hyopthesis is referred as Interface Hypothesis (IH) (Sorace and Filiace 2006).

- Interfaces are further divided into internal and external interfaces.

  Internal interface: between components of the language system, e.g.

    syntax-semantics

  external interface: between syntax and a cognitive system not specific to language, such as the syntax-discourse interface (Serratrice et al. 2004; Sorace 2011; Sorace et al. 2009; Tsimpli and Sorace 2006).

Interface Hypothesis

- The internal interfaces are assumed to be unproblematic.

- The external interfaces are the locus of ultimate fossilisation in L2 acquisition.

- The external interfaces are also subject to protracted delays in bilingual first language acquisition and are also easily affected under reduced input conditions in L1 attrition.

- Pure syntax is still predicted to be acquirable.

IH: supporting evidence

- A large body comes from the distribution of overt and covert pronominal forms in null-subject languages.

➢ simultaneous bilingual first language acquisition (e.g. Serrattrice et al. 2004; Sorace et al. 2009); L1 attrition (e.g. Tsimpli et al. 2004); heritage speakers (Montrul 2004) ; L2 ultimate attainment (e.g. Sorace and Filiaci 2006).

- The studies found that the discourse-pragmatic constraints of the distribution of pronominal forms posed problems but not the syntactic licensing of *pro*

- Empirical evidence supporting the successful L2 acquisition of internal interfaces have been reported for the lexicon-syntax interface in Montrul (2005) and for the lexcon-semantics interface in Montrul and Slabakova (2003) and Tsimpli and Sorace (2006), among others.

Why are external interfaces unacquirable

- Representational account

  ---Tsimpli et al.'s study of first language (L1) attrition
    of Greek and Italian (2004). The L1–L2 divergence is argued to underlie the
    attrition effects at the syntax–discourse interface.

  ---Hopp (2004): Persistent L1 influence underlies L2 learners' target-deviant
     behaviours on interfaces in a study of L2 acquisition of German.

  ---Montrul (2010): It is likely that L1 transfer contributes to the non-
     convergence of interfaces in the L2 acquisition of Spanish by heritage
      speakers.

- processing resources account (e.g. Sorace and Filiaci, 2006).

  ---The fated vulnerability of interfaces is due to processing difficulties.

  ---The acquisition of interface categories requires:
  - The relevant syntactic and discourse knowledge
  - Learners' ability to integrate the two types of knowledge, which may be beyond L2 learners' processing resources.

IA and L2 development

- Sorace (2011) describes L2 acquisition as unwarranted extension of IA.
- L2 learners should 'experience similar interface problems to those experienced by bilingual children in the course of their language development, an area encompassed by the IH' (White 2011: 109).
- Although IA emphasize its focus on ultimate (un-)acquirability, White argues that interface problems cannot possibly emerge out of the blue in near-native grammars and should exist in L2 development.
- Whatever (representation or processing) is difficult at the near-native level will be even more difficult at less proficient levels (Lardiere, 2011; Slabakova, 2008; White, 2011).
- L2 development should be considered as well as ultimate attainment to fully test the IH hypothesis.

The IH questioned

- Several studies have found the syntax–discourse interfaces are ultimately acquirable despite possible delays (Ivanov, 2009; Iverson et al., 2008; Kraš, 2008; Rothman, 2007, 2009; Slabakova and Ivanov, 2011).

- Yuan (2010) studied L2 acquisition of the relation between various types of licensing elements and the interpretation of *wh*-variables as existential polarity words.

- He found that the licensing relation was acquired for some licensors but not for others.

- Yuan proposes that L2 learners' success or failure in acquiring interfaces (in particular, syntax–semantics interface) is not domain-wide. They are variable dependent, e.g.'the categorical nature of elements involved in the interface relationship, the status of these elements in the target language speakers' grammar, the input the learners are exposed to, the cross-linguistic influence, etc.' (p. 258).

Overt and Covert arguments: English

- * *e* likes John.

- *John likes *e*.

- He likes John.

- John likes him.

- John$_i$ says that he$_{i/j}$ likes Tom.

- John$_i$ says that Tom likes him$_{i/j}$.

- Everyone$_i$ says that he$_{?i/j}$ likes Tom.

- Everyone$_i$ says that Tom likes him$_{?i/j}$.

Overt and Covert arguments: Chinese

- *Ta*/*e* xihuan Xiao Zhang.
  he/*e*   like   Xiao Zhang
  '*He*/*e* likes Xiao Zhang.'

- Xiao Zhang xihuan *ta*/*e*.
  Xiao Zhang like   him/*e*
  'Xiao Zhang likes *him*/*e*.'

Interpretation of *ta* in the embedded argument position

- Xiao Zhang$_i$ shuo *ta*$_{i/j}$ xihuan Lao Wang.

  Xiao Zhang   say   he   like   Lao Wang

  'Xiao Zhang$_i$ says that *he*$_{i/j}$ likes Lao Wang.'

- Xiao Zhang$_i$ shuo Lao Wang xihuan *ta*$_{i/j}$.

  Xiao Zhang say   Lao Wang like   him

  'Xiao Zhang$_i$ says that Lao Wang likes *him*$_{i/j}$.'

The Overt Pronoun Constraint (OPC)

- Montalbetti (1984): The interpretations of overt pronouns are more restricted in null-subject languages. For instance, the overt Spanish pronoun *él* 'he' in the embedded subject cannot refer to the quantified matrix subject *nadie* 'nobody'.

- *Nadie$_i$ sabe   que él$_i$ vendrá.

  nobody know: 3Sg that he come: 3SgFUT

  'Nobody$_i$ knows that he$_i$ will come.'

                          (Alonso-Ovalle and D'Introno 2000: 3)

- The Overt Pronoun Constraint (Montalbetti 1984) does not apply in Chinese.

Meigeren$_i$ dou shuo $ta_{i/j}$ xihuan zhe bu   dianying.
everyone all   say   he like   this CL film
'Everyone$_i$ says that $he_{i/j}$ likes this film.

Meigeren$_i$ dou shuo Lao Wang xihuan $ta_{i/j}$.
everyone all   say   Lao Wang like   him
'Everyone$_i$ says that Lao Wang likes $him_{i/j}$.'

The interpretation of the embedded null arguments in Chinese

- Zhangsan$_i$ shuo $e_{i/j}$ xihuan Lisi.
  Zhangsan say   like   Lisi
  *'Zhangsan$_i$ says that $e_{i/j}$ likes Lisi.'

- Meigeren$_i$ dou shuo $e_{i/j}$ xihuan Lisi.
  everyone all   say   like   Lisi
  *'Everyone$_i$ says that $e_{i/j}$ likes Lisi.'

- Zhangsan$_i$ shuo Lisi xihuan $e_{*i/j}$.
  Zhangsan say   Lisi   like
  *'Zhangsan$_i$ says that Lisi likes e_j.'

- Meigeren$_i$ dou shuo Lisi xihuan $e_{*i/j}$.
  everyone all   say   Lisi like
  *'Everyone$_i$ says that Lisi likes e_j.'

Romance languages such as Italian and Spanish also allow null subjects.

a. [*e*] parle. (Italian)

    speaks

 b. [*e*] habla. (Spanish)

    speaks

Syntactic analysis of *pro*

- Taraldsen (1978) observes that the possibility of *pro*-drop in a language often correlates with the existence of an inflectional morphology paradigm, in particular a rich system of agreement.

- Rizzi (1986): *pro* has to be licensed and identified.

    a. Formal licensing:

    pro is Case-marked by X^0.

    b. Identification:

    Let X be the licensing head of an occurrence of *pro*: then *pro* has the grammatical specification of the features on X coindexed with it.

(Rizzi 1986: 520-524)

- Rizzi's theory cannot explain how null subjects are identified in languages like Chinese.

Morphological Uniformity Principle

- Jaeggli and Safir (1989):

   a. Null subjects are permitted in all and only languages with morphologically uniform inflectional paradigms.

   b. Morphological Uniformity

   An inflectional paradigm P in a language L is morphologically uniform iff P has either only underived inflectional forms or only derived inflectional forms.

(Jaeggli and Safir 1989: 29)

- It fails to explain why Swedish does not allow null subjects, although it has a uniform paradigm (Alexiadou and Anagnostopoulou 1998).

Null subjects: Huang (1984)

- He suggests that the following principle is crucial in the identification of *pro*.

- *Generalized Control Rule* (GCR)
 Coindex an empty pronominal with the closest nominal element.
(Huang 1984: 552)
- The nominal element can be both an NP and an AGR.
- No AGR in Chinese

    Zhangsan$_i$ shuo e_i xihuan Lisi.
    Zhangsan say   like   Lisi
    *'Zhangsan$_i$ says that e_i likes Lisi.'

Null objects

- Huang argues that *pro* is not allowed in the object potion in Chinese.

    a. e_i, Zhangsan$_j$ shuo Lisi bu   renshi $t_{i/*j}$.

      Zhangsan   say Lisi not know

      *'Zhangsan$_j$ says Lisi does not know $e_{i/*j}$.'

    b. Zhangsan$_j$ shuo Lisi bu renshi $ta_{i/j}$.

      Zhangsan say   Lisi not know him

      'Zhangsan$_j$ said that Lisi does not know $him_{i/j}$.'

- GCR: an empty pronoun needs to be co-indexed with the closest nominal element.
- Binding Principle B: A pronoun cannot be A-bround in its governing category.

- Huang assumes that the null object is derived by topicalization, through which the object is moved to the topic position. What is really missing is the topic rather than the object of the sentence.

- The null object is a variable.

- Chinese allows variable type of null element as it allows a 'Topic NP Deletion Rule', which operates across discourse to delete the topic of a sentence under identity with a topic in a preceding sentence (Huang 1982, 1984; Tsao 1977). The result of such a deletion process is formally a 'Topic Chain' (Huang 1984: 549).

- The variable type of null element is also allowed in the subject position in Chinese.

- Susan yang le   yi   zhi xiao gou, *e* hen ke'ai.

  Susan raise PART   one CL little dog   very cute

  *'Susan has a puppy, *e* is very cute.'

The minimalist proposal of null elements

Holmberg (2005):

- empty categories in the GB theory are incompatible with the Minimalist Program.

- The traces, including variables, are the most obvious cases of this incompatibility.

- Traces are considered to be copies that are deleted at PF in a process of chain-reduction (Chomsky 1993; Nunes 1995, 2004).

- The analysis of *pro* put forward by Rizzi (1986) cannot be maintained within the Minimalist Program (Chomsky 1995, 2000, 2001).

TP

      pro$_i$ T'

        T$_i$

       [3Pl]

(Roberts 2007: 3)

- Rizzi argues that *pro* needs to be identified by I.

- Chomsky (1995, 2000, 2001) distinguishes between valued and unvalued formal features such as φ-features. The φ-features of an NP are interpretable, as they restrict the denotation of the NP. The person, number or gender features of a verb, auxiliary or adjective are uninterpretable.

- In accordance with Chomsky (2001), the φ-features of T are unvalued, and are assigned values by entering into an Agree relation with a valued counterpart, such as the subject DP.

- It is not possible for an inherently unspecified pronoun to be specified by the φ-features of I, as those features are themselves inherently unspecified.

- *Hypothesis A*

Different from languages that prohibit null subjects, the φ-features of T are valued in languages that allow null subjects. Spec TP is either absent or filled by an expletive *pro*, depending on whether the EPP feature of T can be satisfied independent of the agreement features.

- *Hypothesis B*

The φ-features of T are unvalued in null-subject languages as well as in languages that do not allow null subjects. Null-subject languages allow *pro* with valued φ-features. Similar to any overt pronoun, *pro* occupies Spec TP position and values the unvalued features of T. The fact that *pro* is silent is a PF matter.

- Holmberg (2005) points out that Hypothesis A is empirically inadequate in explaining Finnish. Finnish first person pronoun *minä* can be phonologically unrealized.

(Minä) puhun   englantia.

  I   speak-1Sg English   (Holmberg 2005: 10)

- If Hypothesis A is adopted, ϕ-features of the verb *puhum* 'speak' are valued. The EPP feature of T is either satisfied by the valued ϕ-features of *puhum* 'speak' or by a covert expletive pro.

- If the EPP feature of T is checked by the ϕ-features of the verb or a covert expletive pro, the existence of the expletive *sitä* will crash the sentence below as it is generally assumed that expletives only fulfil the function of checking the EPP feature.

- Minä sitä   olen   käynyt Pariisissa.

    I   EXPL have-1Sg visited Paris-INE

 'I've been to Paris (would you believe it).'/'I'm the one who has been to Paris.'

    (Holmberg 2005: 20-21)

- The null subject is a pronoun that is not pronounced.

- Roberts (2010a, 2010b) further formalises this idea and proposes that the null subject is derived from deletion of a subject pronoun in Romance null-subject languages.

e canto.

   sing: 1Sg

$$TP$$

$$T \qquad vP$$

[u$\color{red}{D}$, Pers:__,Num:__, EPP]

     (D)

    [iD, Pers:1, Num: Sg]

- A goal is defective if and only if the goal's formal features are a proper subset of those of the probe. Defective goals always delete/never have a PF realisation independently of their probe.

- The English T lacks the D-feature, so the subject cannot be a defective goal of T and has to be phonologically realized.

Problem with Chinese null elements

- East Asian languages do not have ϕ-features on C, T or v, and thereby allow radical pro-drop.

- Saito (2007): null arguments in East Asian languages are elements that are constructed in the preceding discourse and subsequently copied into the argument positions at LF.

- Tomioka (2003): null elements in discourse *pro*-drop languages are simply phonologically null versions of bare NPs

- Neeleman and Szendrői (2007, 2008): the distribution of radical null arguments can be accounted for by a zero-realization rule.

- a. Zhangsan$_i$ shuo $e_{i/j}$ renshi Lisi.

  Zhangsan say   know Lisi

  'Zhangsan says that $e_{i/j}$ knows Lisi.'

 b. Zhangsan$_i$ shuo Lisi renshi $e_{*i/j}$.

  Zhangsan say Lisi know

  'Zhangsan$_i$ says that Lisi knows $e_{*i/j}$.'

A new account for Chinese null elements

- The embedded subject position allows two types of null elements. An embedded null subject is derived from deletion of a bare reflexive or deletion of a topicalized element.

- Chinese allows the bare reflexive *ziji* to appear in the embedded subject position.

- *ziji* is an NP for the following reasons.

➢ First, *ziji* is different from pronouns in that it does not have valued φ-features (Huang 1982, Huang and Tang 1991), and its antecedent has to be a sentence-internal element.

➢ The lack of valued φ-features is instantiated by the fact that it does not distinguish gender, number or person in its reference. The

➢ NP assumption is also supported by the morphological structure of the complex reflexive *tazij* 'himself'. If *ta* occupies the determiner position (Abney 1987), it is natural to assume that *ziji* is in NP.

➢ It has been proposed in the literature that determiners are not of absolute necessity in Chinese, and that bare NPs without determiners can appear in argument positions (Chierchia 1998; Tomioka 2003).
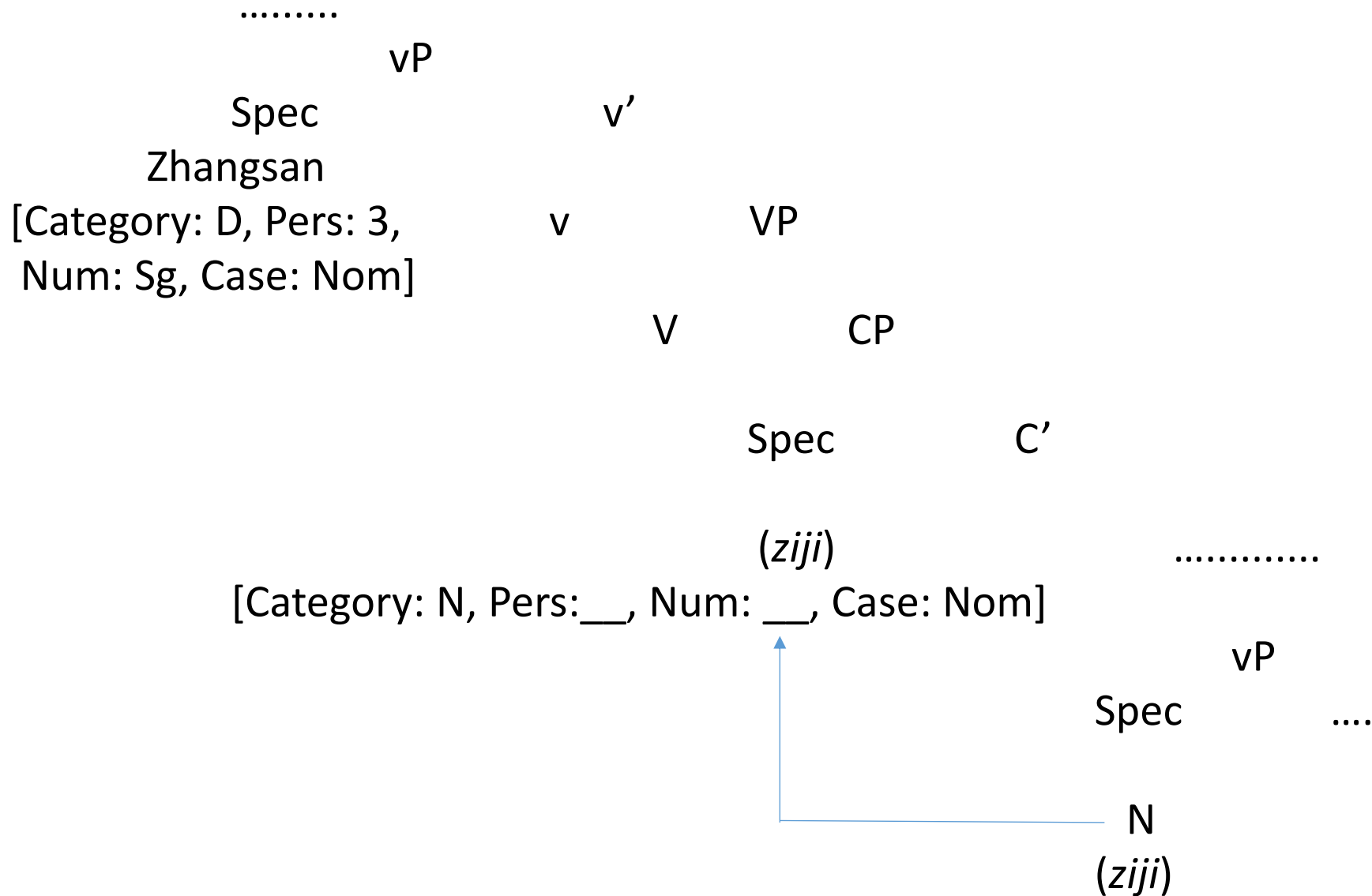
Thus it is possible for *ziji* to appear in the embedded subject position below.

Zhangsan shuo *ziji* qu guo Lundun.

Zhangsan say   self go EXP London

'Zhangsan says that *self* has been to London.'

Syntactic analysis: embedded subject

....

vP

Spec   v'

Zhangsan
[Category: D, Pers: 3,   v   VP
 Num: Sg, Case: Nom]

                                        V   CP

                                    Spec   C'

                                    (*ziji*)   ....
[Category: N, Pers:__, Num: __, Case: Nom]

                                                                    vP

                                                                Spec   ....

                                                                    N
                                                                (*ziji*)

- I assume that the embedded C in (15) probes *ziji* in Spec vP of the embedded clause and values its unvalued case feature.

- Chomsky (2008) proposes that only phase heads (i.e. C and v) have ϕ-features. In some languages such as English, the ϕ-features of C are transmitted to T.

- Chomsky further suggests that the notion of ϕ-feature inheritance by T from C is parameterized across languages.

- In line with this, I assume that the Chinese C does not transmit its unvalued ϕ-features to T.

- C rather than T probes ziji in Spec vP of the embedded clause.

- The EPP feature of C then moves *ziji* from Spec vP to Spec CP.

- The ϕ-features of *ziji* are determined by the matrix subject, *Zhangsan*.
- Let us investigate if it is possible to establish Agree between *Zhangsan* and *ziji*.
- In line with the Phase-Impenetrability Condition (PIC), *ziji* in Spec CP is visible to *Zhangsan*.
- Both of them are active in the matrix vP phase.
- I assumed that the he unvalued ϕ-features trigger *ziji* to probe upward, and get valued by the matrix subject. For discussion of upward probing, refer to Baker (2008), Hicks (2006) and Rezac (2004) among others.
- The crucial thing is that deletion takes place at PF, after the computation of the whole sentence is completed.
- At PF, *ziji* has the same ϕ-features with the matrix subject. In the meantime, being a nominal category, *ziji* has a nominal feature— the [N] feature. The matrix subject has a [D] feature, which is the definiteness feature (Longobardi 1994; Roberts 2010a, 2010b). The [D] feature properly includes the [N] feature. The features of *ziji* are properly included in those of *Zhangsan*, leading to the deletion of *ziji*.

(2) Q: (Lisi qu guo Lundun ma?)

   Lisi go EXP London Q

   'Has Lisi been to London?'

A: a. Zhangsan shuo *e* qu guo Lundun.

   Zhangsan say   go EXP London

   'Zhangsan says that *e* (*e = Lisi*) has been to

   London.'
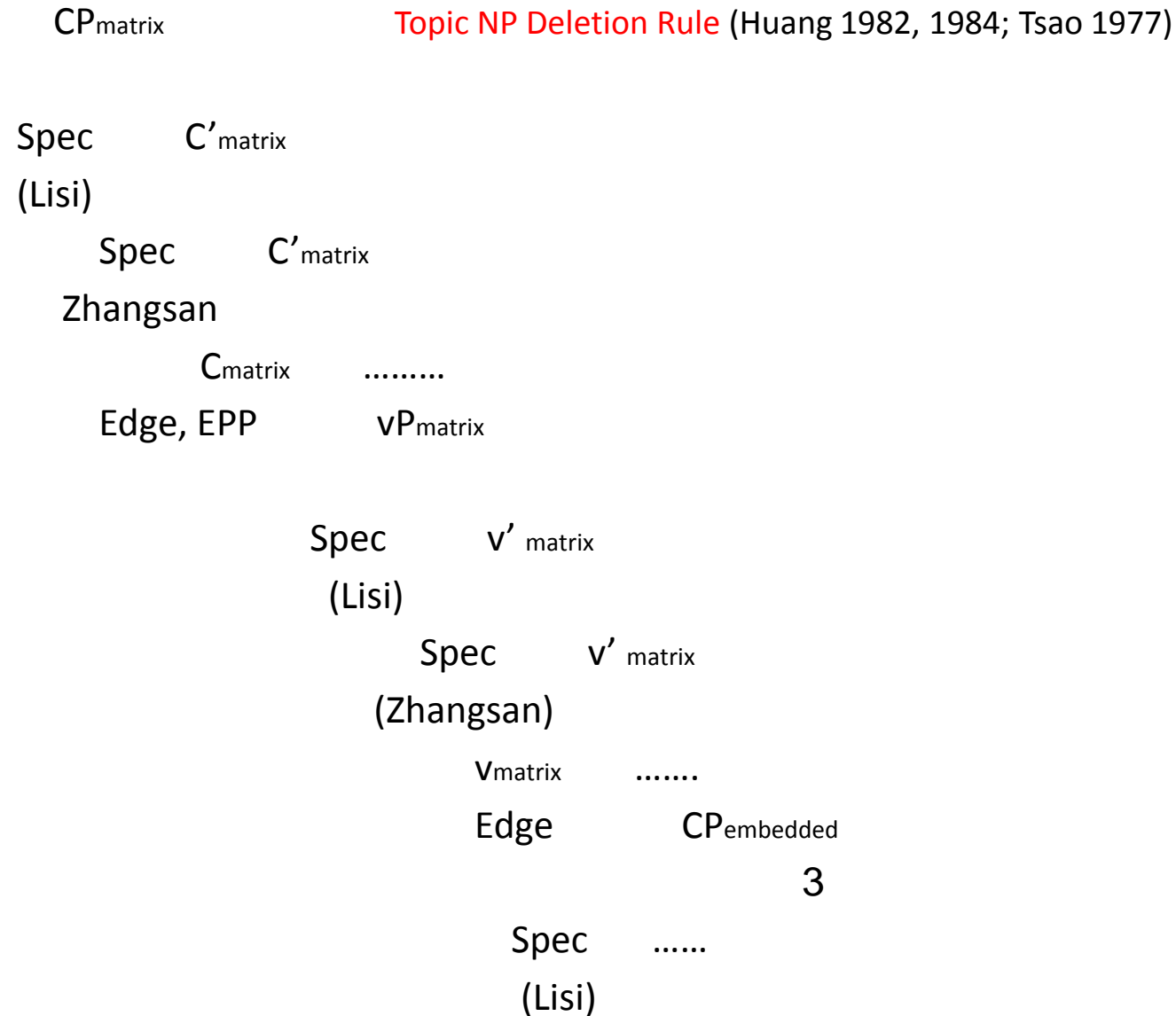
   b. Zhangsan shuo *ziji* qu guo   Lundun.

   Zhangsan say   self go EXP London

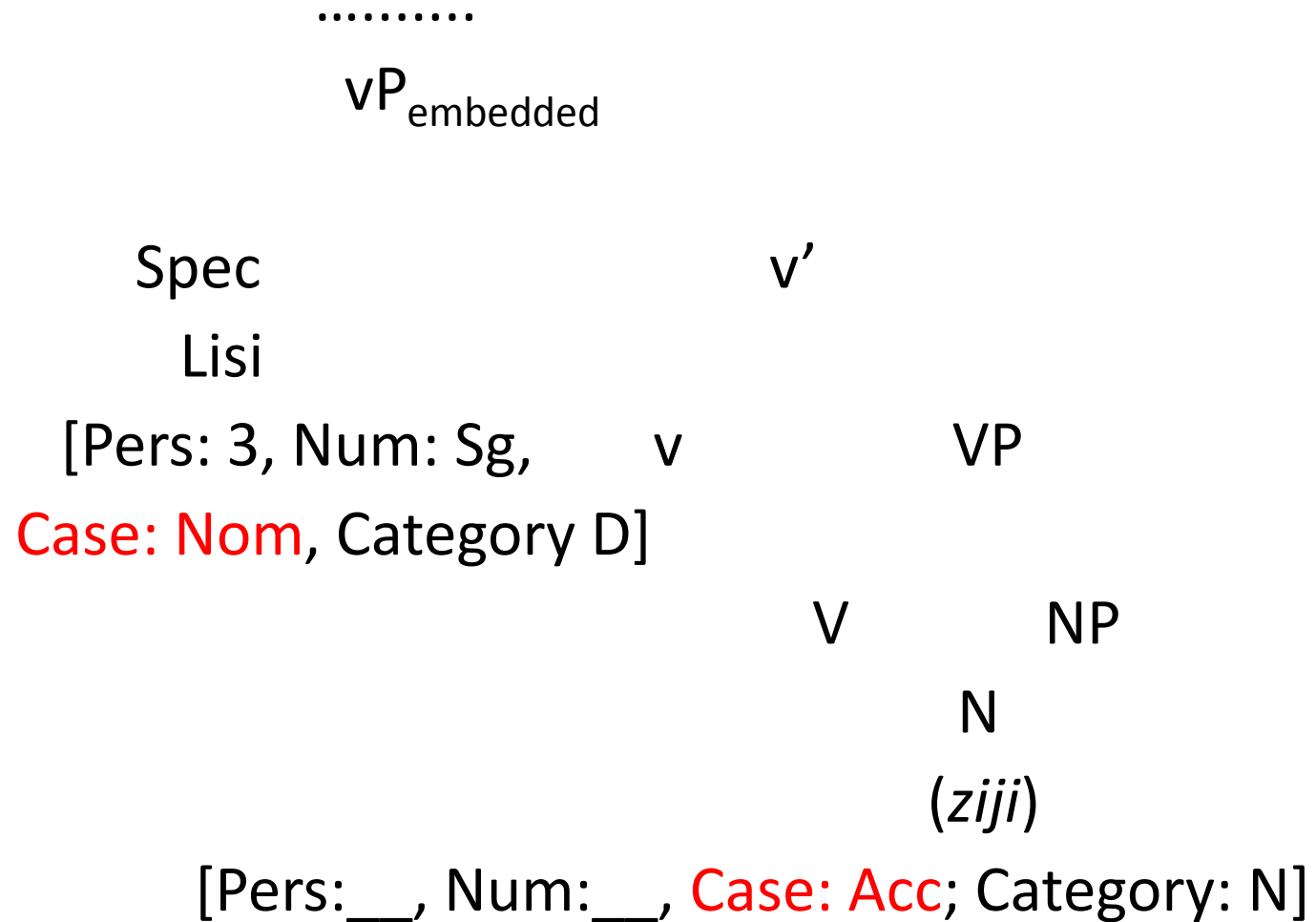   'Zhangsan says that *self* (*self ≠ Lisi*) has

   been to London.'

Syntactic analysis: embedded subject

Figure 2:

CP_{matrix} Topic NP Deletion Rule (Huang 1982, 1984; Tsao 1977)

Spec C'_{matrix}

(Lisi)

     Spec C'_{matrix}

    Zhangsan

       C_{matrix} ....

    Edge, EPP vP_{matrix}

           Spec v'_{matrix}

          (Lisi)

             Spec v'_{matrix}

            (Zhangsan)

               v_{matrix} ....

               Edge $CP_{embedded}$

                       3

                 Spec   ......

                 (Lisi)

- I assume that the topicalized element is riggered to move to the edge of vP and then to the topic position (Chomsky 2008). Then the interpretation is assigned.

- The Edge feature of the matrix v triggers *Lisi* to move to the upmost specifier position of the matrix vP, leaving a copy in the embedded Spec CP.

- The upmost specifier position is a left edge position, which is different from the specifier position where an external argument originates.

- The Edge feature of the matrix CP triggers *Lisi* to move further to the Spec CP$_{matrix}$.

- All the lower copies are suppressed because of chain-reduction except for the highest one.

- In line with the Topic NP Deletion Rule, the topic of a sentence can be deleted as a piece of old information in the previous discourse.

Syntactic analysis: embedded object (1)

....

vP$_{embedded}$

Spec   v'

Lisi

[Pers: 3, Num: Sg,   v   VP

Case: Nom, Category D]

V   NP

N

(*ziji*)

[Pers:__, Num:__, Case: Acc; Category: N]

- *ziji* is base-generated in the complement position of the embedded VP.

- Its Case feature is valued as accusative by agreeing with v.

- Its unvalued ϕ-features trigger it to probe upward as they cannot be valued in its c-commanding domain.

- They are valued by those of the embedded subject *Lisi*.

- At PF, the features of *ziji* do not constitute a subset of those of the embedded subject, as *ziji* has an accusative Case feature, whereas the embedded subject has a nominative Case feature.

- *Ziji* is not defective with respect to *Lisi* and therefore cannot delete.

(3) Q: Lisi renshi Lao Wang ma?

Lisi know Lao Wang Q

'Does Lisi know Lao Wang?'

A: Zhangsan shuo Lisi bu   renshi *e*.

Zhangsan say   Lisi not know

*'Zhangsan says Lisi does not know *e* (*e*

= Lao Wang).'

- The embedded object is base-generated as the complement of VP.

- The Edge feature of each phase triggers *Lao Wang* to move cyclically until it reaches Spec CP$_{matrix}$.

- All the lower copies are suppressed except for the one at Spec CP$_{matrix}$. We will have the sentence if the topicalized object is spelled out.

Previous studies

- The interpretation of overt and covert embedded subjects has been investigated in Spanish (Lozano, 2003; Pérez-Leroux and Glass, 1997, 1999) and Japanese (Kanno, 1997; Marsden, 1998).

- An important focus of these studies is the acquisition of the Overt Pronoun Constraint (OPC): i.e. the overt pronoun can take a referential matrix subject as a possible antecedent but not a quantified one.

- The OPC is used to test Universal Grammar access in second language acquisition in these studies. Several subsequent studies raise doubts about the universality of the OPC (Gürel, 2002; Ojima, 2004; Yamada, 2005).

- These studies indicate that the overt pronoun in an embed- ded argument position cannot refer to the matrix subject in Turkish or Japanese, whereas the null element can, whether the matrix subject is quantified or referential. The null element in these studies is analysed as *pro*. The interpretation of the overt pronoun and *pro* in native grammars and L2 grammars are explained through parameterized governing categories or Distributed Morphology.

- Like the English *he*, the Chinese pronoun *ta* can refer to both referential and quantified matrix subjects. The distinction between the referential matrix subject and the quantified one is not important to the L2 study of the interpretation of *ta* and the null element in Chinese. Most of the studies above only research the subject position except for Yamada (2005). Nonetheless, the subject–object asymmetry in Chinese noted in this article is not reported in Yamada's study.

- Yuan (1993) researches if null arguments are allowed in L2 Chinese grammars of English speakers at different states through an Acceptability Judgment task. The results indicate that English-speaking learners accept both null subjects and null objects from a very early stage onwards.

Research questions

- Can English-speaking L2 learners interpret *ta* in the embedded argument posi- tions in the same way as native Chinese speakers?

- Can they acquire Øziji as a defective goal?

- Can they acquire Øtopic and represent it as deletion of the topicalized subject/object

- under identity with the chain topic of the topic chain (i.e. as a piece of old infor- mation in the discourse)?

Participants

Group	No. of subjects	Average age	Average no. of months learning Chinese	Average no. of months in Mainland China/Taiwan	Mean scores in the cloze test (n=40)	
					M	SD
HI	26	22	30.7	10.9	24.3	3.3
AD	13	21	43.3	21.0	33.4	2.1
NS	16	25	n/a	n/a	38.4	1.5

Materials

- The participants were required to complete three tasks:

➢ a proficiency cloze test

➢a written interpretation task (WIT)

➢a picture judgment task (PJT).

Written Interpretation Task

- The task format of the WIT followed those of Kanno (1997), Marsden (1998) and Yamada (2005).

- (10) Da Wei shuo mingtian *e* yao qu Beijing.

-     Da Wei say tomorrow   will go Beijing

-     'Da Wei says that *e* will go to Beijing tomorrow.

- **Question: According to the sentence above，who is going to Beijing tomorrow?**

- (a) Da Wei   (b) someone other than Da Wei

-    (c) either (a) or (b)   (d) incorrect sentence

-    (e) I don't understand the sentence

-

- There were 48 test sentences in the WIT, of which 12 are relevant to the current article.

The PJT task

- The PJT consisted of thirty-six context-providing pictures, twelve of which were concerned with the current study.

- Each picture is accompanied by four sentences. Two of them are concerned with the current study.

- Each sentence is accompanied by a scale ranging from -2 to 2 (from 'completely untrue to the picture' to 'completely true to the picture').

- An option 'incorrect sentence' was also included. The participants were instructed to choose this option if they thought the sentence was unacceptable. According to Yuan (1993), L2 learners allow null arguments from a very early stage onwards. This option only served as a precaution. As reported in the following section, it was rarely chosen.

- Variables: sentence position (subject vs. object); NP type: (*ta* vs. null element); and reading (i.e., the type of picture: coref vs. disj). Test sentences accompanying a coreferential picture were either the same with or minimally different from those accompanying the corresponding disjoint picture. At the most, the differences between them were the names of the cartoon figures which were given in the pictures in both English and Chinese.

Picture judgement task

- A disjoint picture   A coreferential picture

Type	
1) *Subj+coref Ta*	The picture depicts a situation where *ta* in the embedded subject position needs to be coreferential with the matrix subject.
2) *Subj+disj Ta*	The picture depicts a situation where *ta* in the embedded subject position needs to refer to an entity other than the matrix subject.
3) *Subj+coref Null*	The picture depicts a situation where the embedded null subject needs to be coreferential with the matrix subject.
4) *Subj+disj Null*	The picture depicts a situation where the embedded null subject needs to refer to an entity other than the matrix subject.
5) *Obj+coref Ta*	The picture depicts a situation where *ta* in the embedded object position needs to be coreferential with the matrix subject.
6) *Obj+disj Ta*	The picture depicts a situation where *ta* in the embedded object position needs to be coreferential with the matrix subject.
7) **Obj+coref Null*	The picture depicts a situation where the embedded null object needs to be coreferential with the matrix subject.
8) *Obj+disj Null*	The picture depicts a situation where the embedded null object needs to refer to an entity other than the matrix subject.

Results

- Mean scores of L2 learners and controls

Subject groups	HI		AD		NS	
	M	SD	M	SD	M	SD
Subj+coref Ta	1.44	0.68	1.49	0.65	1.63	0.45
Subj+disj Ta	1.55	0.58	1.62	0.45	1.77	0.45
Subj+coref Null	1.49	0.40	1.19	0.91	1.75	0.48
Subj+disj Null	0.07[†]	1.18	0.95	0.70	1.38	0.64
Obj+coref Ta	1.6	0.50	1.69	0.25	1.69	0.45
Obj+disj Ta	1.54	0.42	1.44	0.66	1.5	0.56
Obj+coref Null	0.17[†]	1.09	-0.92	1.24	-1.85	0.30
Obj+disj Null	1.37	0.78	1.23	0.92	1.71	0.61

- Table 4: Individual results for *Subj+disj Null*

	Full acceptance (3/3)	Partial acceptance (2/3)	No acceptance
HI (26)	7 (26.9%)	4 (15.4%)	15 (57.7%)
AD (13)	7 (53.8%)	4 (30.8%)	2 (15.4%)
NS (16)	12 (75%)	4 (25%)	0

Table 5: Individual results for *Obj+coref Null*

	Full rejection (3/3)	Partial rejection (2/3)	No rejection
HI (26)	5 (19.2%)	3 (11.5%)	18 (69.2%)
AD (13)	6 (46.2%)	4 (30.8%)	3 (23.1%)
NS (16)	16 (100%)	0	0

Summary of results

- Table 6: A brief summary of the findings

		Subject position		Object position	
		Null	Ta	Null	Ta
HI	Coref	√	√	??	√
	Disj	??	√	√	√
AD	Coref	√	√	X	√
	Disj	√	√	√	√
NS	Coref	√	√	X	√
	Disj	√	√	√	√

Discussion

- The hypothesis made in line with the IH is borne out for the interpretation of *ta*. L2 learners do not have any problem interpreting *ta* correctly.

- The interpretation of *ta* tested here stems from the D-pronoun nature. At the most it involves lexicon-syntax and syntax-semantics interfaces (Tsoulas and Gil 2011). It does not involve external interfaces, as no pragmatic constraint is concerned.

- It is also possible that transfer plays a positive role here, as *ta* is a D-pronoun like *he/him* in learners' native language.

Discussion

- L2 learners do not have any problem relating the embedded null subject to the matrix subject.

- It is argued in Section II that the Chinese embedded null subject that refers to the matrix subject results from deletion of *ziji* as a defective goal of the matrix subject. It is possible that learners correctly represent Øziji in the embedded subject position from the HI state onwards.

- However, we cannot deny the possibility that learners may perceive the embedded null subject as a phonetically null equivalent of an English pronoun. If this is the case, we have no clear evidence to show the state at which the coreferential embedded null subject is represented as Øziji.

- As argued later, it is possible that learners are not fully aware until the advanced state that null pronouns are not allowed in Chinese. Then it is likely that only advanced learners correctly represent the coreferential embedded null subject as Øziji.

- In either case, the data support the IH that purely syntactic knowledge is acquirable.

Discussion

- Øtopic contributes to the disjoint reading of the embedded null subject. This type of null element is derived from the deletion of a topicalized embedded subject under identity with the chain topic of the topic chain.

- As its derivation involves both the syntactic computation and the discourse notion of topic chain, it is a syntax-discourse interface category and is hypothesized to be vulnerable to fossilisation according to the IH.

- This hypothesis is not supported by the data here: The L2 learners successfully take a discourse entity as the referent of the embedded null subject at the advanced state, althought they fail to do so at the HI state.

- This supports the claim that syntax-discourse interfaces may be prone to delays but they are ultimately acquirable (*inter alia* Rothman 2007, 2009; Slabakova and Ivanov 2011).

Discussion

- L2 learners do not correctly reject the coreferential reading of the embedded null object until the advanced state. L2 learners may have considered the embedded null object as a null *ziji* or *ta* at earlier states (see Zhao (2008) for details).

- I argued that case clash rules out the possibility of Øziji in the embedded object position. Null pronouns are not allowed, as Chinese T does not have a D feature. The disallowance of Øziji or null pronouns here is due to purely syntactic reasons.

- The fact that L2 learners eventually reject the coreferential reading of the embedded null object are consistent with the IH that pure syntax is acquirable.

Discussion

- Learners have acquired Øtopic in the embedded object position by the HI state.

- Recall that Øtopic is not acquired in the embedded subject position until the advanced state.

- The fact that Øtopic as a syntax-discourse interface category is eventually acquired in both positions supports Yuan's (2010) claim that problems with interface categories may not be domain-wide.

- More importantly, sentence position is an important factor in the acquisition of Øtopic. It is acquired later in the subject position than in the object position.

- Why?

Discussion

- The processing account alone obviously cannot account for it, as the processing of Øtopic involve the integration of multiple types of information in both positions.

- Øtopic is derived from deletion of the topicalized element as a piece of old information in the discourse in compliance with TNPDR.

- In this sense, the successful representation of Øtopic takes topicalization and TNPDR as two prerequisites.

- The derivational difference of Øtopic in the two positions lies in the element that is topicalized: the embedded subject vs. the embedded object.

- Both English and Chinese allow the topicalization of the embedded object, as in (12).

  a. Jeff, Tom thinks that Lee knows.

  b. Zhangsan, Lisi yiwei Wangwu renshi.

    Zhangsan Lisi thinks Wangwu know

    Zhangsan, Lisi thinks that Wangwu knows.

Discussion

- Chinese diverges from English regarding subject topicalization.

    a. Zhangsan, *e* shi ge hao haizi.

      Zhangsan   be CL good child

       *'Zhangsan, *e* is a good child.'

    b. *John, *e* is a good child.

    c. Xiao Zhang, Lao Wang shuo *e* xihuan Lisi.

    Xiao Zhang Lao Wang say   like Lisi

    'Xiao Zhang, Lao Wang says that *e* likes Lisi.'

Discussion

- This difference between English and Chinese can be explained in line with Rizzi and Shlonsky (2007), who propose that an element cannot be moved out once it has been moved to the subject position (i.e., Spec TP in the framework adopted in this article) during computation.

- I assumed above that the Chinese subject moves to a position (i.e., Spec-CP) other than the usual subject position and thus allows subject topicalization.

- For the *that* trace effect in English, I assume that the embedded subject moves to Spec-CP when *that* does not exist. It moves to Spec-TP otherwise, where it gets frozen.

  a. *Lee, Tom thinks that *e* knows Jeff.

  b. Lee, Tom thinks *e* knows Jeff.

Discussion

- The comparison between English and Chinese regarding topicalization points to a possibility that crosslinguistic influence may have contributed to the difference between the subject position and the object position in the acquisition of Øtopic.

- It is possible that L1 transfer may have positively influenced L2 grammars in terms of the embedded object topicalization. Consequently, L2 learners allow the topicalization of the embedded object from the very beginning.

- This speculation is supported by Yao (2007), who finds that English-speaking learners are aware that an embedded object in Chinese can be topicalized as early as the beginners' state.

- In comparison with object topicalization, the influence L2 learners possibly get from their native language is more complex and thus may be more confusing regarding subject topicalization.

- The Spec-vP to Spec-CP movement prevalent in the target language is restricted in learners' native language.

- Alternatively, the Spec-vP to Spec-TP movement of the embedded subject may be a developmental stage that all L2 learners of Chinese go through.

Discussion

- Processing difficulties may also contribute to the later acquisition of Øtopic in this position.

- Even after learners become aware that the Chinese subject occupies Spec-CP, they may be still faced with added difficulty in processing Øtopic in the embedded subject position, as they need to integrate a newly established syntactic derivation and discourse information.

- By contrast, the acquisition of Øtopic in the embedded object position requires the integration of discourse information and syntactic derivation that is acquired early due to positive L1 transfer.

Discussion

- Two types of positive evidence may possibly trigger the awareness of subject movement from Sepc-vP to Spec-CP: subject topicalisation and the allowance of complex reflexives in the embedded subject position.

Zhangsan renwei *taziji* shi ge tiancai.

 Zhangsan think himself be CL genius

*'Zhangsan thinks that *himself* is a genius.'

Chomsky (2008) suggests that the Binding Principle A can be explained as a case of Agree. I argue that in order for *Zhangsan* to probe *taziji,* the latter has to be seen by the former. *Taziji* cannot be seen by *Zhangsan* if it is at Spec-TP. It can be seen only if it is at Spec-CP according to the PIC.

Discussion

- Neither the topicalization of matrix subjects nor the use of complex reflexives in embedded subject positions appears very frequently in Chinese.

- In addition, the topicalized matrix subjects can be easily mistaken for subjects.

- In written Chinese, although a comma or a topic marker can be used to mark *Zhangsan* as a topic, not all topics are followed by them.

- In spoken Chinese, some Chinese speakers use a pause or a topic marker to mark the topic of the sentence. Nonetheless, not everybody does so. Even when a pause or topic marker is used, learners may not be able to detect it, because of its subtlety or its lack of phonological prominence.

   Zhangsan$_i$ a, e_i shi ge laoshi.

   Zhangsan TOP   be CL teacher

   'Zhangsan$_i$, e_i is a teacher.'

- And the differenece between input and intake (Carroll 1999, 2001). Although the above positive evidence exists from the very beginning, L2 grammars may not be sophisticated enough to allow learners to perceive or perceive enough of it to fully expunge their initial grammars until the advanced state.

Conclusion

- While purely syntactic categories such as Øziji and the internal interfaces such as the interpretation of *ta* are acquirable, some syntax-discourse external interface categories such as Øtopic are also acquirable, contra the IH.

- Øtopic is acquired earlier in the embedded object position than in the embedded subject position. This study provides supporting evidence to Yuan's (2010) claim that the interfaces should not be treated holistically, and that variables such as L1 transfer and input should be considered in their acquisition.

- Empirically, it finds that *ta* and the covert element do not always share the same meaning in embedded argument positions in either the native Chinese grammar or English-speaking learners' L2 grammars.