Interfaces in Linguistics
Interfaces in Linguistics

New Research Perspectives

Edited by
RAFFAELLA FOLLI AND CHRISTIANE ULRBRICH

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General Preface

The theoretical focus of this series is on the interfaces between subcomponents of the human grammatical system and the closely related areas of the interfaces between the different subdisciplines of linguistics. The notion of 'interface' has become central in grammatical theory (for instance, in Chomsky's recent Minimalist Program) and in linguistic practice: work on the interfaces between syntax and semantics, syntax and morphology, phonology and phonetics etc. has led to a deeper understanding of particular linguistic phenomena and of the architecture of the linguistic component of the mind/brain.

The series covers interfaces between core components of grammar, including syntax/morphology, syntax/semantics, syntax/phonology, syntax/pragmatics, morphology/phonology, phonology/phonetics, phonetics/speech processing, semantics/pragmatics, intonation/discourse structure as well as issues in the way that the systems of grammar involving these interface areas are acquired and deployed in use (including language acquisition, language dysfunction, and language processing). It demonstrates, we hope, that proper understandings of particular linguistic phenomena, languages, language groups, or inter-language variations all require reference to interfaces.

The series is open to work by linguists of all theoretical persuasions and schools of thought. A main requirement is that authors should write so as to be understood by colleagues in related subfields of linguistics and by scholars in cognate disciplines.

The current volume provides a snapshot survey of the kind of empirical and explanatory success that an interface-based approach to the analysis of linguistic phenomena brings. It spans the field, crossing boundaries between lexical semantics, syntax, compositional semantics, morphology, phonology, phonetics, and discourse. The chapters employ cross-linguistic methodologies, insights from acquisition, processing, and psychology, as well as careful linguistic analyses within single languages. The book as a whole highlights the explanatory success that may arise from bringing to bear, upon the problem at hand, generalizations and technologies developed independently in theories of radically different kinds of linguistic phenomena.

David Adger
Hagit Borer
L2 problems would be treated as essentially syntactic and grammar internal and located inside the computational system (e.g. Belletti and Leonini 1994). We will refrain from doing either here. We have illustrated cross-linguistic differences concerning the relationship between word order and discourse pragmatics in V2 declaratives in Swedish and German and shown that learners—subtly but persistently—transfer information-structural patterns from their L1 into the L2. In our view, this evidence for transfer can and should stand independently of any particular theoretical slant.

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Processing (In)alienable Possessions at the Syntax-Semantics Interface

CHIEN-JER CHARLES LIN

20.1 Introduction

Possession is an important predicative function commonly expressed in human languages. It is expressed in the form of verbs such as have and be as in John has a car in English and C’est livre est de Charles "This book is of Charles (literal translation)" in French, and in the nominal domain, via possessive noun phrases such as John’s mother and the mother of John. In this chapter, we focus on the construction and interpretation of possessive relations in sentences. In particular, we discuss the special syntactic and semantic properties of relational nouns in contrast with those of non-relational nouns. We show that alienable and inalienable nouns have distinct linguistic behaviours and they induce distinguishable processing patterns in online sentence comprehension.

Possession is used here as a cover term for a wide range of relations held between nominal entities. The phrase the girl’s professor, for example, can be interpreted in multiple ways, some of which are listed in (i).

(i) the girl’s professor:
   a. the person who teaches the girl as a professor in college
   b. the professor that the girl assisted
   c. the professor that the girl is investigating
   d. the professor that the girl writes about

Possessive constructions serve to associate two noun phrases while not specifying precisely how this association should be interpreted. Nevertheless, certain interpretations seem to dominate over others. For instance, within a neutral context, the girl’s professor is preferably interpreted as the professor of the girl in college in (1a), rather than the professor that the girl writes about in (1d). In (2)–(4), the interpretations in the (a)s are preferred in comparison
with those in the (b)s. That is, relations such as kinships terms, ownership, part/whole, and agentivity, are the preferred interpretations in comparison with other pragmatically motivated interpretations.

(2) the boy’s mother:
   a. the woman who is the female parent of the boy
   b. the mother who the boy was painting a portrait of

(3) the boy’s hand:
   a. the hand on the arm of the boy
   b. the hand of a sculpture that the boy was sketching

(4) the boy’s essay:
   a. the essay that the boy wrote
   b. the essay by E. B. White that the boy will talk about in class

Due to the range of plausible interpretations in these possessive phrases, how to reach an appropriate interpretation based on the syntactic, semantic, and discourse information available becomes a critical issue. In this chapter, we look at a specific group of nouns—the inalienable nouns (e.g., kinship terms and body parts)—which are inherently relational. These nouns are not derived from verbs, so their relational nature cannot have been a result of the argument structure of verbs. They are relational in the sense that they create a relation between the noun itself and another entity, which is usually interpreted as the possessor of the noun. Interpretations of these possessive relations lie at the interface of syntax, semantics, and pragmatics as these interpretations can be felicitous or infelicitous due to violations in these different aspects.

20.2 Alienable and Inalienable Nouns: An Initial Differentiation

In some languages, inalienable nouns appear differently than alienable nouns inside noun phrases. Chatino—an Otomanguean language of the Zapotecan family, for instance, places possessor NPs immediately after relational nouns that denote ‘body parts, body pain and body fluids, family members, and certain concrete possessions like houses and clothes, as well as certain abstract possessions like language and memory’ (Carleton and Waksler 2000: 332). Inalienable nouns require the adposition ji to appear between the noun being possessed and the possessor. The following Chatino examples (Carleton and Waksler 1991) illustrate this difference. Examples (5) and (6) are both noun phrases with relational nouns, while (7) is a noun phrase with an alienable noun.¹

(5) yane kunuk
   neck woman
   ‘woman’s neck’

(6) ike niți
   head house
   ‘the house’s roof’

(7) xoːo? ji?i jua
   knife of Juan
   ‘Juan’s knife’

In many other languages (e.g., Chinese, English, Japanese, Korean, French), even though alienable and inalienable nouns are not overtly distinguishable, there remain unique semantic and syntactic properties associated with these nouns. Patterns of sentence comprehension, which we report in section 20.4, provide evidence that corroborates this distinction.

These alienable and inalienable nouns have been given distinct semantic representations. In Barker’s (1995) treatment of possessive descriptions, nouns are distinguished into those that express intrinsic possessive relations (e.g., child) and those that construct possessive relations extrinsically (e.g., human). The denotation of child presupposes the existence of a person that takes this child as an offspring. It is, therefore, a two-place predicate, relating a possessor argument and a person that is possessed as a child. A human, on the other hand, composes a one-place predicate; it is itself argument-complete. This distinction is characterized by the contrastive grammaticality in (8–9; cf. Barker 1995: 76):

(8) Lexical possession:
   a. a child of John
   b. John’s child

(9) Extrinsic possession:
   a. a human (‘of John’)
   b. John’s human

Postnominal possessives (8a and 9a) in English can only be used with relational nouns since the nominal head is obligatorily supplied with an internal argument. Given that human does not take an internal argument,

¹ One of the reviewers suggested that, in languages such as Vietnamese, the preposition in noun phrases with alienable nouns such as (7) tends to be omitted when the possessive relation between the two nouns is unambiguous. The appearance of the preposition between the nouns may have to do with the potential ambiguity that exists between the noun phrases. When the relation is unambiguous, the preposition tends to be omitted.
a human of John in (9a) is ill-formed. Prenominal possessives like (8b) and (9b) take both intrinsic and extrinsic possessive arguments depending on at which level the possession is formed. In prenominal possessions, therefore, the two nominal arguments hold an ambiguous relation—both lexical and extrinsic possessions are possible. Lexical possession is formed at the level internal to the noun phrase, creating an inherent inalienable relation only in (8b). Extrinsic possession is obtained by coercing a relation between the possessor and the possessor based on the pragmatic context, which is possible in both (8b) and (9b). Thus, while John's child can mean either 'the offspring of John (i.e., lexical possession)' or 'the child (of someone else) that John is taking care of (i.e., extrinsic possession with the internal argument suppressed),' John's human exclusively denotes a human that is not possessed by John but is related to John in some way based on the context (i.e., extrinsic possession). For instance, this human can be a sketch of a human body that John just created.

Barker (1995: 54) represents the meaning of lexical possession as (10), and that of extrinsic possession as (11). R stands for a two-place predicate, while P stands for a one-place relation. \( \pi \) stands for the extrinsic possessive relation, which is interpreted based on the context.

(10) Lexical possession: \( \lambda R[R] \)

(11) Extrinsic possession: \( \lambda P \lambda X \lambda y [\pi(x, y) \land P(y)] \)

The notion of relational nouns is often discussed under the rubric of inalienable possession. Vergnaud and Zubizarreta (1992: 596) referred to inalienable nouns as 'inherently defined in terms of another object, of which it is a part and involving 'argument dependency in lexical representations' [italics original].' Accordingly, inalienable nouns take semantic arguments at the lexical level, assigning the role of possessor to these obligatory arguments that they take. Body-part terms are the 'inherent, universal' inalienable nouns, with the extended categories including 'nouns for clothes, kinship terms, picture nouns, and still others' (Vergnaud and Zubizarreta 1992: 597). In this chapter, we focus on kinship terms.²

Based on argument saturation at the lexical level and the additional discourse-linked operator \( \pi \) for interpreting extrinsic possessions, the asymmetry presented in (2)–(4) has a representational explanation. For inalienable nouns such as mother and hand, a genitive construction naturally takes the available argument as the possessor, satiating the possessor argument requirement at the lexical level of possession. The secondary discourse-motivated interpretations can be construed when the required possessor argument is suppressed and when a discourse-bound operator \( \pi \) is coerced into existence.³

20.3 Alienability and Syntactic Alternations

As discussed so far, inalienable nouns subcategorize for an internal possessor argument at the lexical level of the representation. Based on this subcategorizational difference, inalienable and alienable nouns also diverge in syntax (Alexiadou 2003; Castillo 2001; Español-Echavarria 1997). In (12), where a part-whole relation has to exist between the external argument position (John) and the secondary predicate, for instance, only inalienable nouns such as body parts can appear in these secondary predicates, not alienable nouns. In (13), the inalienable noun son has to be licensed by a possessor argument. When the possessor of this kinship term cannot be identified, the sentence (e.g., 13b) is ungrammatical.⁴

(12) a. Mary kicked John on the leg.
   b. *Mary kicked John on the door.

(13) a. A man came into the room.
   b. *A son came into the room.
   c. Mary's son came into the room.
   d. Mary has a son.

Previous syntactic literature on alienability (e.g., see review in Antrim 1996) generally agrees that inalienable nouns take arguments. This argument has to be bound by an antecedent at a higher level—either in the same sentence or in the discourse. In (13), the possessor appears at the specifier position of the possessive DP in (13b), and at the specifier of the sentential CP in (13d).

² Barker (2000: 7) analyses this process as applying a detransitivizing type shifter Ex and then applying the 'pragmatically-controlled relational variable' \( \pi \).

⁴ Note that this structure is limited to part-whole relations and does not extend to the kinship relations. That is, it is ungrammatical to say Mary kicked John on the father, even though the father here is an inalienable noun.

⁵ Given enough contextual information about the possessor, however, this sentence can become more acceptable as in A son came into the room to look for his mother.
Notably, what is crucial in these sentences with inalienable nouns is that a c-commanding relation has to exist between a possessor argument and the noun itself, not just the linear precedence of the possessor relative to the inalienable noun. In Lin (2006), I demonstrated that in Mandarin possessive relative clauses, where the relative clauses are followed by their head nouns, a kinship term that appears at the sentence-initial position as in (14a) can linearly precede its possessor argument (i.e., the head of the relative clause). This sentence is nevertheless grammatical because the inalienable noun is c-commanded by the head-noun. (14b), however, is ungrammatical because the possessor argument of the inalienable noun is not bound by any c-commanding antecedent.

(14) a. 女兒被卡車撞死的那位校長感到痛心。
    nyuer bei kache zhuangsi de nawei xiaozhang gandao
dughter BEI truck hit-dead REL that president feel
tongxin
heartbroken
‘The president whose daughter was hit dead by a truck was heartbroken.’

b. *女兒被卡車撞死。
    nyuer bei kache zhuangsi
dughter BEI truck hit-dead
‘Daughter was hit dead by a truck.’

Binding relations can be satiated not only within the same sentence by a c-commanding relation but also within the immediate discourse whereby the possessor is can be inferred. Therefore, (14b) can become acceptable if the context provides sufficient information to license the possessor argument (i.e., the parent(s)) subcategorized for by daughter.

One consequence of the analysis that an inalienable noun takes a syntactic argument is that the possessor argument is subcategorized for and receives its theta role at the lower base-generated position close to the inalienable noun. Syntactic derivations associated with this implicit possessor argument have been accounted for using possessor extraction or possessor raising, which occur across predicate boundaries such as those of secondary predicates. In the following, we provide examples where secondary predications involving alienable and inalienable nouns have distinct syntactic realizations in three languages—Japanese, Korean, and Chinese. These languages demonstrate the existence of a possessor argument position that needs to be licensed by a possessor operator.

In Japanese, the alienability of a noun phrase is related to whether it can compose a secondary predicate. Inalienable nouns form argument-taking predicates while alienable nouns do not. This can be shown by contrasting (15a–b) and (15c–d) (Ogawa 2001: 13).

(15) a. Taroo ga Hanako no syasin o mita.
    Taroo NOM Hanako GEN picture ACC saw
    ‘Taroo saw Hanako’s picture.’

b. Taroo ga Hanako no syasin-de mita.
    Taroo NOM Hanako GEN picture-in saw
    ‘Taroo saw Hanako in a picture.’

c. Taroo ga Hanako no kuruma o mita.
    Taroo NOM Hanako GEN car ACC saw
    ‘Taroo saw Hanako’s car.’

d. *Taroo ga Hanako no kuruma-de mita.
    Taroo NOM Hanako GEN car-in saw
    ‘Taroo saw Hanako in a car.’

Like John’s child in (8b), Hanako no syasin ‘Hanako’s picture’ in (15a) is ambiguous. In the inalienable sense, Hanako is the person whose picture has been taken; in the alienable sense, Hanako can be the person who took the picture or just a person who owns the picture (in which someone else appears). Only the inalienable sense is possible with (15b), where the inalienable noun forms a stage-level predicate that appears in a secondary predicate. The possessor position is licensed by Hanako, a possessor argument that has been raised to receive the accusative case. In (15c), where kuruma ‘car’ is an alienable noun, a secondary predicate like (15d) is unlicensed as there is no possessor position inside the secondary predicate to be bound by the possessor, Hanako.

Analogous examples are drawn from the ‘multiple object construction’ in Korean (Choe 1987: 101, cited in Ogawa 2001: 6), in which only body parts are allowed to appear in secondary predicates:

4 Abbreviations used in the transliteration: ACC: accusative case; BEI: passive marker in Mandarin;
CL: classifier; DEC: declarative marker; GEN: genitive case; NOM: nominative case; PST: past tense;
REL: relativizer.

7 See Castillo (2001) for a typological review of possessor raising across languages. An alternative
account resorts to binding relations between the higher possessor argument and the empty posses-
sive pronoun. The fact that a possessive pronoun can sometimes appear at the possessor argument
position in some languages suggests that the empty position can be a pronoun bound by the possessor.
Therefore, even though we adopt a raising analysis for most of the data discussed below, the possibility
of a pronoun analysis is not excluded.
    Chelsoo NOM Yenghi-ACC eye ACC see-PST-DEC
    'Chelsoo saw Yenghi’s eye.'

b. 'Chelsoo ka Yenghilul kwaja lul mek-et-ta.
    Chelsoo NOM Yenghi-ACC cookie ACC eat-PST-DEC
    'Chelsoo ate Yenghi’s cookie.'

Similar patterns can be found in Mandarin Chinese. In the following, we focus on sentences with secondary predicates embedded in Mandarin BA constructions. As in Japanese and Korean, these secondary predicates can only be licensed when they are headed by an inalienable noun with an empty possessive pronoun being c-commanded by a possessor argument. Mandarin BA construction has the linear structure of (17). Semantically, DP1 denotes the do-er; DP2 the do-ce. The VP within the BA-phrase contains a secondary predicate, out of which DP2 moves.8

(17) DP1 BA DP2 V tDP2

The examples in (18) show that when the alienable and inalienable nouns appear inside a possessive phrase headed by the genitive marker de in Mandarin (similar to's in English and no in Japanese denoting both internal and external positions), all three DPs—his two legs, his drumstick, and his lecture—can appear as DP2. That is, (18a–c) are well-formed both semantically and syntactically. However, only (18a), in which the noun is inalienable, has a grammatical counterpart in (19).

(18) a. 我把他打斷雙腿。
    wo ba ta de shuang tui daduan
    I BA he GEN two leg break
    'I broke his two legs.'

b. 我把他打斷鼓棒。
    wo ba ta de gubang daduan
    I BA he GEN drumstick break
    'I broke his drumstick.'

c. 我把他的演講打斷。
    wo ba ta de yanjiang daduan
    I BA he GEN lecture break
    'I broke (disrupted) his lecture.'

(19) a. 我把他打斷雙腿。
    wo ba ta da duan shuang tui
    I BA he break two leg
    'I broke his two legs. (lit. I broke him two legs.)'

b. *我把 他打斷 鼓棒。
    wo ba ta daduan gubang
    I BA he break drumstick
    'I broke his drumsticks.'

c. *我把 他 打斷 演講。
    wo ba ta daduan yanjiang
    I BA he break lecture
    'I broke (disrupted) his lecture.'

Such contrasts in grammaticality can be accounted for by postulating a possessor argument subcategorized for by shuangtui 'the two legs' in the secondary predicate of (19a). This argument position holds a dependency with the possessor ta 'he' (i.e., DP2), which has been raised to the specifier position above the VP to receive case. The lack of this possessor argument in (19b) and (19c) broaches the dependency between DP2 and a trace inside the VP, thus leading to the ungrammaticality.9

Putting together evidence from the syntax and semantics associated with alienable and inalienable nouns, we propose the structure in (20). Inalienable nouns take an argument at the specifier position, composing a narrow inalienable possessive interpretation.10

(20) Structure of inalienable noun phrases

\[ \text{[possessor]} \triangleleft \text{N} \]

\[ \text{N (inalienable noun)} \]

---

8 See Li (2006) for a comprehensive review of the syntax of Mandarin BA.

9 The grammaticality judgements in this article are based on Mandarin Chinese spoken in Taiwan. Similar judgements were also provided by Cheng and Ritter (1987).

10 Similarly, adopting the distinction between S-syntax and L-syntax of Hale and Keyser (1993), it has been proposed that inalienable possessors are at the level of L-syntax, and alienable possessors at S-syntax. Suzuki (1997), for instance, proposed a structure where x is a relational head that takes the possessor at the specifier position and the possessee (i.e., the inalienable noun itself) as the complement.
Alienable possessive phrases are constructed as a functional phrase taking the alienable noun as the complement and another DP at the specifier position as the external possessor. This functional phrase is headed by a relational variable $\pi$, which is interpreted based on the context. The proposed syntactic representation for alienable possessive phrases is provided in (21). In the next section, we examine the processing consequences of these different representations.

(21) Structure of alienable noun phrases

```
  PossP
     / \    /
    /   \  /  
  DP   Poss'
     \   /    
    \  /  
     \|/    
      \|/   
       \|/  
       Poss

| N [+alienable]  
```

20.4 Processing Alienable and Inalienable Possessions: A Self-paced Reading Experiment

A sentence-comprehension experiment was conducted to investigate the processing of possessive relations. We hypothesize that inalienable noun phrases such as kinship terms subcategorize for a possessor argument. This argument position facilitates the integration of a possessor argument in a sentence as the possessor noun can tightly integrate with the thematic grid created by the inalienable noun. Possessive relations involving alienable nouns, on the other hand, would require additional integration costs because the possessive relation is not readily coded within these alienable noun phrases and an additional functional phrase needs to be coerced, with the operator heading the functional phrase ($\pi$) being licensed by a dominant relation in the context.

The distinctive processing of inalienable and alienable possessions mirrors processing differences between arguments and adjuncts in the sentence-processing literature. Much research on sentence comprehension investigated whether the theta role of a gap position is assigned immediately or left unspecified until the verb is reached (Altmann 1999; Aoshiha, Phillips, and Weinberg 2004; Boland, Tanenhaus, Garnsey, and Carlson 1995; Stowe, Tanenhaus, and Carlson 1991). With regard to arguments and adjuncts, it is generally agreed that the arguments of a verb are more readily integrated into the sentence than its adjuncts (Ahrens 2003; Boland et al. 1995; Schütze and Gibson 1999; Speer and Clifton 1998). Speer and Clifton (1998), for instance, found that participants read preposition phrases faster when they are arguments of a verb than when they are adjuncts. Preposition phrases that can serve as either arguments or adjuncts also tend to be understood as arguments (Schütze and Gibson 1999).

In summary, the nominal entities associated with a verb can be distinguished into arguments and adjuncts. In sentence processing, the arguments of a verb are integrated and understood more easily, while adjuncts take more efforts. We therefore predict that if the possessors of inalienable nouns are indeed arguments, they will be processed faster than the possessors of alienable nouns.\footnote{See also Pytlíček and McElree (2006: 547–8) for a review on processing differences between arguments and adjuncts.}

The experiment reported below consisted of self-paced readings of sentences that contain Chinese possessive relative clauses like the following:

(22) Possessive Relative Clause in Mandarin Chinese

```
女兒 打翻水的 那位 先生 喝門很大
nyuer dafan shui de navei xiansheng sangmen hen da
daughter spill water REL that guy voice very loud
```

'The guy whose daughter spilled the water has a loud voice.'

Relative clauses in Chinese are prenominal; that is, the relativized positions are bound by head nouns that follow the relative clauses. In a possessive relative clause like (22), the head noun xiansheng 'guy' serves as the possessor of nyuer 'daughter' in the relative clause. In accordance with the syntactic and semantic evidence discussed, we hypothesize that the relativized possessor is located at the possesse position.\footnote{In Lin (2006) and Lin (2008), I showed that the parser is sensitive to the different structural positions of the possessee in a possessive relative clause, suggesting that a relativized possessor gap does exist at the positions of these possession noun phrases. When the possesse is at a higher structural position (e.g., the subject) thus being closer to the possessor head, the construction of a possessive dependency is easier than when it is located at a lower position (e.g., the object).} Reading-time data allow us to see whether the alienability of the possessee noun phrase affects how possessive relations are constructed. The following experimental results corroborate the alienable/inalienable distinction in Mandarin nouns.

20.4.1 Participants

Twenty-four undergraduate students (six males, eighteen females) from National Cheng-Chi University were paid to participate in the experiment. All participants were native speakers of Mandarin Chinese, who were exposed to Mandarin Chinese since birth. The participants had normal vision, and were naive to the purpose of the experiment.
20.4.2 Materials

The experimental materials were sentences with passive possessive relative clauses, in which the first noun was a possessee and the head noun of the relative clause served as the possessor. In the inalienable condition, the first noun was an inalienable noun (i.e., a kinship term). In the alienable condition, the first noun was an alienable noun (i.e., a non-kinship personal term). Examples of the materials are provided in (23)–(24):

(23) Condition A: Inalienable kinship terms

父親被警察抓住的總裁顯得十分

faqin bei jingcha zhuazou de zongcai xiande shifén

father BEI police take REL chairperson appear very

huangzhang

tensions

'The chairperson whose father was taken by the police appeared very nervous.'

(24) Condition B: Alienable non-kinship personal terms

員工被警察抓住的總裁顯得十分

yuwangong bei jingcha zhuazou de zongcai xiande shifén

employee BEI police take REL chairperson appear very

huangzhang

tensions

'The chairperson whose employee was taken by the police appeared very nervous.'

Twenty-four pairs of sentences were created (see Appendix for the paired list of alienable and inalienable nouns used); these pairs of nouns used across conditions were matched on word frequency (based on Sinica Corpus; CKIP, 1995) and online response times on possessive relations. All the target nouns (the alienable and inalienable nouns and the head nouns) appeared only once in the experiment. The materials were arranged by a Latin-Square design, so that each participant only read a sentence once in either condition A or condition B. In addition to the target sentences, 122 filler sentences of various syntactic types were included as distractors.

20.4.3 Procedure

A self-paced reading experiment, with a moving-window presentation, was conducted using Linger 2.94 developed by Doug Rohde at MIT. No spaces were inserted between words or phrases since the standard writing of Chinese does not contain spaces. All materials were presented randomly, with consecutive occurrences of the target items avoided. After the last word of each sentence, the whole sentence disappeared. A comprehension question on the content of that sentence appeared. The comprehension question was either a true/false question or a multiple-choice question. No feedback was given if the participant response was correct. Participants were instructed to read the sentences at a natural rate, and to understand the sentences in order to answer the comprehension questions correctly. Twelve practice trials were presented before the main section started. The reading time for each region, the time taken to answer the comprehension questions, and the responses to the comprehension questions were recorded. Participants took a break every fifty sentences. The whole experiment took twenty to twenty-five minutes to complete.

20.4.4 Results and Discussion

Comprehension accuracy did not differ across conditions (93.06 per cent for sentences with inalienable nouns; 90.63 per cent for sentences with alienable nouns). The average reading times of each region were compared across conditions. Only reading times of the sentences that were correctly understood were analysed. The regions in the experimental sentences were coded as in (25).

patien; the chairperson has a(n) father/employee), on the computer screen. The participants determined if such relations were possible. The results showed no significant differences on response times between inalienable nouns (kinship terms) and alienable nouns (non-kinship personal terms), suggesting that the possibility of possessive relations was not an interfering factor in this experiment.

In Mandarin, multiple terms sometimes refer to the same kinship relationship. In this study, husband appeared twice as 李老 and as 丈夫 zhongtong), and father appeared twice as 父亲 fujing and as 老家 laoba). All other kinship relations only appeared once.

For example, the comprehension question for (23) was: Was the nervous person a leggar? The question for (24) was: Who was nervous? The employee or the chairperson?
where the possessive relation between N1 and N3 gets constructed. Since the N3s in both inalienable and alienable conditions are identical, the reading-time difference on this region should be due to the differences in integrating these nouns with the alienable/inalienable nouns (N1s).

These experimental results were consistent with the syntactic and semantic analyses provided in previous sections, that possessive relations involving inalienable nouns are more easily constructed since the possessor noun phrase directly saturates the argument requirement of the relational noun. Possessions involving alienable nouns are more consuming to construct because an additional functional phrase needs to be inserted, and a context-dependent variable (π) needs to be postulated at the possessive head for semantic interpretation.

20.5 Concluding Remarks

In this chapter, we provided linguistic and processing evidence for the existence of thematic relations between inalienable nouns and their possessors. Inalienable nouns can appear in secondary predicates where an implicit possessor position located at the inalienable noun is licensed by a higher possessor argument. The lack of such a position in the secondary predicate keeps inalienable nouns from being c-commanded by a possessor argument in these constructions. Semantically, an inalienable noun assigns the thematic role of (inherent) possessor to its argument, while an alienable possessive relation is constructed by coercing a context-dependent relation between the external possessor and the alienable noun. A sentence comprehension experiment demonstrated that inalienable nouns are indeed processed differently from alienable nouns. The parser is more efficient in associating an inalienable noun with its possessor argument than constructing a possessive relation between an alienable noun and an external possessor. Both the linguistic and processing evidence, therefore, suggests that inalienable nouns are inherently relational, subcategorizing for an internal possessor argument. This relational property of an inalienable noun can account for its syntactic patterns, the dominant semantic interpretations, and the processing efficiencies that are distinct from those of alienable nouns.

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Appendix: N1(inalienable)/N1(alienable)-N2-N3(head noun) in the experiment

1. 女兒(daughter)/病人(patient)-歹徒(gangster)-醫生(doctor)
2. 外甥(son of sister)/球友(ballgame mate)-流氓(mob)-男子(guy)
3. 父親(father)/員 工(employee)-警察(police)-總裁(chairperson)
4. 孫子(grandson)/同 作(friend)-經理(manager)-婦人(woman)
5. 老婆(wife)/團員(tour mate)-壞人(bad guy)-導遊(tour guide)
6. 父母(parents)/同學(school mate)-鄰居(neighbor)-工讀生(part-time student worker)
7. 外公(mother's father)/保母(nanny)-恐怖份子(terrorist)-小朋友(kid)
8. 祖父(father's father)/雇主(employer)-大學學生(college student)
9. 兒子(son)/主任(section manager)-地下錢莊(illegal loaner)-行員(banker)
10. 老公(husband)/長班(class leader)-卡車(truck)-女老師(female teacher)
11. 孩子(child)/學生(student)-濃煙(smoke)-研究員(researcher)
12. 夫妻(husband)/顧客(customer)-海浪(sea wave)-老闆娘(female boss)
13. 妻子(wife)/讀者(reader)-癌症(cancer)-作家(writer)
14. 姊姊(elder sister)/秘書(secretary)-仰慕者(admirer)-董事長(business president)
15. 养女(mother's brother)/歌迷(fan)-警衛(security guard)-明星(showbiz celebrity)
16. 表弟(younger male cousin on mother's side)/保鑣(bodyguard)-法官(judge)-國大(senator)
17. 媳婦(daughter in law)/長官(supervisor)-記者(reporter)-隊長(captain)
18. 妹夫(brother in law)/士官(Sergeant Major)-貨車(cargo truck)-連長(lieutenant)
19. 姑娘(aunt on father's side)/廚師(chef)-火(fire)-飯店經理(hotel manager)
20. 外婆(maternal grandmother)/藝人(performer)-蜜蜂(bee)-製作人producer
21. 堂哥(elder male cousin on father's side)/貴賓(guest of honour)-香蕉(banana)-小開(rich kid)
22. 兄長(elder brother)/幹事(administrative secretary)-敵人(enemy)-議員(legislative representative)
23. 外孫(daughter's son)/僕人(servant)-洪水(flood)-富豪(very rich man)
24. 老爸(father)/工友(janitor)-不良少年(teenage gangster)-校長(principal)