Learning and Unlearning Object Drop in Anaphoric and Non-anaphoric Contexts in L2 English

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Abbreviations

ACC	accusative case
ACO	arbitrary cognate objects
Agr	agreement
AJIT	acceptability judgment and interpretation test
AJT	acceptability judgment test
ASP	aspect marker
BNC	British National Corpus
C	complementiser
CI	classifier
CIP	classifier phrase
CP	complementiser phrase
D	determiner
DP	determiner phrase
e/ec	empty category
EPP	extended projection principle
FFFH	failed (functional) features hypothesis
ForceP	force phrase
GEN	genitive case
I / Infl	inflection
IP/TP	inflection phrase/tense phrase
L1	first language
L2	second language
LE	le (aspect marker)
NCO	null cognate object
NEG	negation marker

NOM	nominative case
NP	noun phrase
NSL	null-subject language
Num	numeral
NumP	numeral phrase
O	object
PERF	perfective
POSS	possessive
pro	little pro
PRES	present
Q	question particle
R^2	effect size
RDH	representational deficit hypothesis
SFP	sentence final particle
SLA	second language acquisition
T	tense
TopicP	topic phrase
UG	universal grammar
VO	verb-object
VPE	verb phrase ellipsis
XP	X phrase

Abstract

Chinese allows object drop in contexts where there is an antecedent (anaphoric contexts), where English generally requires an overt object pronoun (e.g. *Mary's bike is broken. I am going to repair *(it) for her*). In non-anaphoric contexts, however, English allows a null cognate object *e* as in *Mary reads* [*e*] *every night* whereas Chinese requires an overt cognate object (*kan-shu*, literally 'read-book'). Previous SLA studies indicate Chinese learners of L2 English have problems unlearning anaphoric object drop in English, generally ascribed to effects of L1 transfer. This study brings a novel perspective to the L2 learnability problem by incorporating Cheng and Sybesma's (1998) proposed negative correlation between the two rules: that allowing object drop in anaphoric contexts is incompatible with allowing object drop in non-anaphoric contexts. The following questions are posed:

(1) To what extent can Chinese learners of English (CLE) learn the non-anaphoric null cognate object rule?

(2) To what extent do CLE use anaphoric object drop?

(3) To what extent does unlearning use of null objects in anaphoric contexts correspond to learning use of null objects in non-anaphoric contexts?

This study tested 85 adult CLE in Hong Kong, with 22 native English speaker controls, using an innovative battery of judgment and production tasks. The findings demonstrated that CLE could be 100% target-like in using null arbitrary cognate objects, but were more variable in using anaphoric object drop (ranging from 60-100%). It is concluded that CLE are not necessarily restricted by L1 transfer effects but can successfully learn the null arbitrary cognate object interpretation rule for L2 English, and this seems to demonstrate access to UG in L2 when there is learning under poverty of stimulus. The difference in success between the two rule conditions show no support for Cheng and Sybesma's (1998) hypothesis that there is a connection between allowing anaphoric object drop and disallowing non-anaphoric object drop.

Chapter 1. Introduction

Learnability of formal syntactic properties of the target language has been widely

studied to examine the role of Universal Grammar (UG) in L2 acquisition. One area

that has not yet been widely studied in the SLA literature is object drop. However, this

phenomenon has been quite extensively discussed in the theoretical literature (see Cole

1987; Huang 1984, 1991, 2009; Hoji 1998; Cummins and Roberge 2003), providing a

novel context for this study. Various types of object drop, or null objects,[1] are found

across languages; the most widely studied type is anaphoric object drop. In the most

general terms, anaphoric object drop means an object is dropped, i.e. not pronounced,

when there is an antecedent in the near context. In early literature on Chinese

grammar[2] (see Chao 1968; Li and Thompson 1981; Matthews and Yip 1994; Huang

2009), anaphoric object drop is said to be characteristic of Chinese. The following are

examples showing anaphoric specific and non-specific object drop in Chinese.

(1.1a)   Speaker A: Mali   kanjian Bide   le   ma?   (Mandarin)
                        Mary   see   Peter   ASP   Q
                        'Did Mary see Peter?'

          Speaker B: ta kanjian   le
                        She saw   ASP
                        'She saw him/Peter.'

The anaphoric specific object *ta/Bide* 'him/Peter' can be dropped in this context in

Chinese because there is an antecedent in the preceding sentence. In the following

example an anaphoric non-specific object drop can also be dropped in this context.

(1.1b)   Speaker A: Zhang   xihuan xiong   (Mandarin)
                        Zhang   like   bear
                        'Zhang like bears.'

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[1] The terms null object and object drop will be used interchangeably in this study.

[2] The syntactic properties of null objects investigated here are the same for both Mandarin and Cantonese.
Hence, illustrations in this study will use both languages interchangeably.

Speaker B: Mali   ye   xihuan
                Mali   also   like
                'Mary also likes them.'

The null object has a non-specific reference: Mary likes anything which belongs to the *kind* or *species* 'bear'. In an anaphoric context such as in (1.1a) and (1.1b), English still requires a pronounced object.

By contrast, English allows another type of object drop, in non-anaphoric contexts. Consider (1.2),

(1.2) David reads [*e*] every day.   (English)

In (1.2) the null object [*e*] does not refer to any specific entity but to some entity which, in the case of the verb *read,* is a 'readable' object, such as a book or a magazine. Hence, I refer to this null object as a *null arbitrary cognate object* (see section 3.4.4 for details). Chinese, however, requires a pronounced cognate object *kan-shu* 'read-book' to convey the cognate interpretation. This difference between Chinese and English has been discussed by Cheng and Sybesma (1998).The following are some examples where an arbitrary cognate object in non-anaphoric contexts is dropped in English but pronounced in Mandarin.

	Mandarin	**English**
(1.3)	kan-shu	read
	'read-book'	
(1.4)	kai-che	drive
	'drive-car'	
(1.5)	chi-fan	eat
	'eat-rice'	

Cheng and Sybesma (1998)

Thus we have two types of object drop, one characteristic of Chinese, the other of English: (i) anaphoric object drop in Chinese and (ii) non-anaphoric object drop in English.

With regard to a connection between anaphoric and non-anaphoric object drop, Cheng and Sybesma (1998) propose that the complementary distribution of those two types of object drop in Chinese and English is not accidental. They (ibid: 87) explicitly state the generalization as "if a language has object pro it does not have empty objects which are not referential". A similar generalization to Cheng and Sybesma's is made in Holmberg (2005, 2010a, b) about null subjects. Null subject languages have either a null third person singular referential subject pronoun (null versions of 'he, she, it'), or a null third person singular generic subject pronoun (a null version of generic 'one') (see section 2.3 for detailed discussion). This adds to the plausibility of Cheng and Sybesma's (1998) idea. That is to say, there may be a reason why Chinese allows anaphoric object drop but not non-anaphoric object drop, and vice versa in English. What could the reason be? There could be a functional explanation to do with avoiding ambiguity. The interpretation of a null argument anyway always requires some extra effort on the part of the listener (including search for an antecedent). If, in addition, a null argument can have several quite distinct interpretations this may just be too much of a burden on parsing to be sustainable as a grammatical property. There could also be a formal explanation, perhaps in terms of economy of derivation (Chomsky 1995: ch. 4) or in terms of a syntactic parameter. I will call this 'the hypothesis of no-ambiguity of null arguments' in this thesis, and will discuss possible explanations in section 3.4.4.

Cheng and Sybesma's (1998) generalization was made primarily on the basis of a comparison of native Chinese and native English language. It is obvious, however, from their presentation, couched in a Chomskyan generative framework, that the notion of language they have in mind is *I-language*, a person's internal linguistic system, a "state of the mind or brain", according to Chomsky (1995: 15-17). In this

thesis Cheng and Sybesma's generalization is tested on the interlanguage of Chinese learners of English, on the basis of the assumption that interlanguage is also an expression of I-language. Interlanguage is in fact widely assumed to be constrained by UG like native languages (e.g. see Selinker 1972; White 1989, 2003; Yip 1995) and therefore a legitimate source of study to investigate the potential applicability of hypotheses such as Cheng and Sybesma's to an L2 context. If Cheng and Sybesma's generalization is right for all internal linguistic systems, including interlanguage, Chinese learners of English should not allow both anaphoric object drop and non-anaphoric object drop. In other words, there is a prediction that we can make, which is that there will be a correlation between unlearning anaphoric object drop and learning arbitrary cognate object drop among Chinese learners of English. The importance of testing Cheng and Sybemas's generalization is that we want to find out whether the no-ambiguity hypothesis of null arguments applies to all internal linguistic systems, all I-languages, and if so, why.

If Cheng and Sybesma are right, there should not be any languages exhibiting both anaphoric object drop and non-anaphoric object drop. However, it seems that there is at least one language, Malayalam, which has both anaphoric object drop and a null arbitrary cognate object.[3] I will come back to this case in section 7.3.3. This may indicate that their generalization does not hold universally. It should be noted that Cheng and Sybesma (1998: 87) explicitly state the generalization "if a language has object pro it does not have empty objects which are not referential" as a generalization applying to all native languages. As we will also see in section 7.3.2, the results of my investigation relating to object drop in an interlanguage (L2 English) also point in the same direction: There is no necessary connection between allowing anaphoric object drop and disallowing non-anaphoric object drop, or vice versa. In other words, the

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[3] This is based on personal communication with Jay Jayaseelan. Malayalam is a Dravidian language from South India.

learnability[4] tasks in learning a null arbitrary cognate object and unlearning anaphoric object drop facing Chinese learners of English would not be formally associated. It is an important theoretical issue whether, or to what extent, data from the interlanguage of L2 learners can be used as evidence for or against generalizations concerning universal constraints on natural language, on a par with data from full-blown native languages. I will discuss this issue, and related issues in Chapter 4, section 4.1, where I will deal with UG-based theories of SLA and studies, discussing the notions of poverty of stimulus and 'access to UG in L2' and identifying the most appropriate SLA theory of transfer and access to adopt in this study.

A number of SLA studies (Fuller and Gundel 1987; Zobl 1994; Yuan 1997; Jiang 2009) have been devoted to understanding how Chinese unlearn anaphoric object drop in L2. Much less attention has been given to exploring acquisition of null arbitrary cognate objects in English by adult Chinese. Hence, my first research question is to what extent Chinese can acquire null arbitrary cognate objects in non-anaphoric contexts in L2 English. Would the impossibility of a null object in non-anaphoric contexts in their L1 pose a learnability problem for Chinese when acquiring a null arbitrary cognate object in L2? Secondly, the other main question is whether the hypothesis of no-ambiguity of null arguments is right: Is there a correlation between unlearning anaphoric object drop and learning non-anaphoric object drop? Or is some degree of ambiguity of null arguments tolerated? To sum up, this study brings a novel perspective to the issue of L2 acquisition of object drop, and null categories more generally, by putting Cheng and Sybesma's (1998) hypothesis to the test. Specifically, the following research questions drive the design of this study:

1. To what extent can Chinese learners of English learn non-anaphoric object drop, specifically null arbitrary cognate objects?

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[4] The terms 'learnability/ learning' and 'acquisition' are interchangeable throughout this thesis, and this also applies to 'learn' and 'acquire'.

2. To what extent can Chinese learners of English unlearn anaphoric object drop? Do they interpret a null arbitrary cognate object as discourse-linked anaphoric object drop?

3. Is there a correlation between learning non-anaphoric object drop and unlearning anaphoric object drop? Is there an interlanguage grammar where both types of object drop are accepted?

In this study, I devise three research tasks with pre-determined aims to address the above research questions and they are (i) an oral task, (ii) a written task and (iii) acceptability judgment and interpretation task (AJIT).[5] The oral and written tasks aim to elicit data specifically on the use of null arbitrary cognate objects in L2. The purpose of adopting more than one method of data collection is to triangulate the findings obtained for the sake of enhancing the reliability of the data. All the details of research questions and methodology will be covered in chapter 5.

In terms of structure and organization of this study, this chapter has introduced the two types of object drop in Chinese and English which will be the focus of the investigation. It has also introduced Cheng and Sybesma's (1998) hypothesis on the complementary distribution of anaphoric object drop and non-anaphoric object drop and highlighted the importance of testing their generalization on the interlanguage of Chinese learners of English. In addition, three research questions have also been presented here. Chapter 2 reviews theoretical approaches towards object realization and object drop, including the lexicon-driven approach and the syntax-driven approach. Chapter 3 examines object drop in Chinese, compared with the counterparts in English. An overview of types of anaphoric object drop including specific and non-specific

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[5] Thanks to an anonymous reviewer in Second Language Research Forum (2012) for his or her comment on naming this research task. This task was conventionally named as Acceptability Judgment Task, but the reviewer pointed out that this task investigates one's acceptance and interpretation of sentences. So, this task was renamed to reflect the task nature and it is Acceptability Judgment and Interpretation Task (AJIT) in this present study.

object drop will be presented. The use of pronounced cognate objects in non-anaphoric contexts in Chinese and its counterparts in English will be reviewed. Furthermore, the structure of the DP in Chinese will be examined. Finally, the derivation of object drop in anaphoric and non-anaphoric contexts is studied. Chapter 4 deals with UG-based theories of SLA and studies, exploring the notions of poverty of stimulus and 'access to UG in L2' and identifying the most appropriate SLA theories of transfer and access to adopt in this study. I look in particular at learning or unlearning object drop in this present SLA study from the point of view of parameter re-setting to discuss why this seems to be the most relevant view of UG-based L2 learnability for my study. The report of the empirical part of my investigation begins in chapter 5, where I turn to all research questions and methodology, explaining what the research tasks are. Participant selection criteria, sample size and ethical and confidentiality issues are also discussed in detail. I will particularly highlight the innovativeness of my study and major modifications on task design for the main study after feedback from two pilot tests. All data collected from research tasks in this study will be presented in chapter 6. Results and discussion will be given in chapter 7, with conclusion and discussion of limitations and implications for further research in chapter 8.

Chapter 2. Theoretical approaches to object realization and object drop

Object drop or object realization has always involved two components: syntax and lexicon. The syntax provides mechanisms that govern the licensing of an object and the recovery of a dropped object, i.e. missing object, whereas the lexicon provides classes of verbs that do or do not allow object drop. The syntax-driven approach suggests that syntax determines argument structure (e.g. Chomsky 1982; Hale and Keyser 1993, 2002; Cummins and Roberge 2003) and the lexicon-driven approach suggests that lexical items path the way syntax will project (e.g. Dixon 1991/2005; Levin, 1993; Levin and Rappaport 2005). There are two approaches to argument realization: the lexicon-driven and syntax-driven approach. The question I am especially concerned with here is the nature of null arbitrary cognate object as in *I read [e] every night*. Is there a null object here, or is there no object? In what follows, I review those two approaches towards argument structure particularly on object realization and object drop. Finally, I discuss Cummins and Roberge's (2003) critique of the lexicon driven-approach, and then assume following their arguments that the syntax-driven approach is the more sophisticated approach.

2.1 The lexicon-driven approach

The lexicon-driven approach is also called the semantic role approach (Levin and Rappaport 2005) because studies of lexical representation assume that grammatically relevant meanings of verbs are represented by different semantic roles (or thematic roles/theta roles) such as *agent, theme, patient,* and *location* and so on. Each single verb or each verb entry is associated with a set of semantic roles. Jackendoff (1990) argues that verbs assigning different semantic roles occur in significantly different syntactic configurations. He illustrates his argument with the two verbs *drink* and

butter, and argues that those two verbs differ syntactically as the former takes an optional object as in *John drank (the wine)* and the latter is obligatorily transitive as in *John buttered *(the bread)*. He proposes that the semantic role of the argument affects the number of arguments required by the verb. Levin and Rappaport (2005) argue that use of semantic roles can bring out differences and similarities in a verb meaning that are reflected in argument expression. They also claim that different argument realizations of a verb, including subject and object arguments, can be attributed to their semantic roles. Under the lexicon-driven approach, the two verbs *eat* and *devour* have often been used as an illustration to argue for different sub-categorizations of verbs, because the former verb allows object drop whereas the latter does not. Consider (2.1) and (2.2),

(2.1) John ate (his food).

(2.2) John devoured *(his food).

Levin (1993) and Rappaport and Levin (1998) contend that different sub-categorizations of verbs like *eat* and *devour* make different demands on object argument expression. Under the lexicon-driven approach, Levin (1993:1) argues that "the behavior of a verb, particularly with respect to the expression and interpretation of its arguments, is to a large extent determined by its meaning". In addition to the notion that two closely related verbs like *eat* and *devour* can have different semantic sub-categorizations, it has been argued under the lexicon-driven approach that different lexical entries can be postulated for a single verb form, with different demands on argument expression. For instance, there would be two different entries for the verb *eat*:

eat_1, unergative, 'eat a meal' (object drop)

eat_2, transitive, 'ingest food in some manner' (object realization)

The overt object after the transitive *eat₂* is assumed to be syntactically present, but the object after the unergative *eat₁* is not projected in the syntactic structure. Briefly put, the lexicon-driven approach basically argues that the above difference in object realization or object drop is attributed to differences in meaning or lexical representation of the verb. This approach argues that all of a verb's meanings are listed in the lexicon, from which the different syntactic frames are projected.

2.2 The syntax-driven approach

The syntax-driven approach proposes that a verb's meaning is derived from the syntactic structure in which it is projected. For example, the difference in interpretation related to object realization and object drop is attributable to mechanism that licenses the object drop within the projected structural representation itself. Cummins and Roberge (2003), criticizing the lexicon-driven approach to the previously-discussed examples of *devour* and *eat*, argue that both verbs have an object that is always in VP, and that verbs like *eat* always have an object, which may be unpronounced, as in *John ate*. They quote Chomsky's (1965) argument that represents the early generative approach to transitivity as an arbitrary lexical property specified on a verb item. They propose that there is an unpronounced cognate object that merges with the verb *eat*. Consider examples (2.1) and (2.2), repeated here.

sub-categorization rules (based on Chomsky, 1965)

(2.1) John ate (his food).   a. eat, V, [___ (NP)]

(2.2) John devoured *(his food).   b. devour, V [_____ NP]

Against the idea that there would be two entries of a single verb *eat* (*eat₁* and *eat₂*), Cummins and Roberge further argue that under the lexicon-driven approach, there should be a third possibility of a projected null object of the verb *eat*. They quote an example from Chomsky (1982) which illustrates a parasitic gap interpretation which

crucially relies on the existence of an available empty object for eat_3 (i.e. a projected

null object is needed):

(2.3) Which document did the spy memorize __ before eating ___?   (Chomsky 1982)

The above sentence has two readings: the natural reading is 'The spy had some

food after she or he had memorized a document', and the frivolous interpretation is

'The spy ate the document once she or he memorized it'. When using a lexicon-driven

approach, there would thus be three lexical entries for a single verb *eat*:

eat_1, unergative, 'eat a meal', incorporates an object component

eat_2, transitive, 'ingest food in some manner', incorporates a manner component that

   forces the presence of an object

eat_3, transitive with a null object, 'ingest specified food'

(Cummins and Roberge 2003)

Therefore, Cummins and Roberge argue that the lexicon-driven approach is not simple.

Instead, they argue that there is a covert cognate object to the verb eat_1 (unergative,

'eat a meal'), and the syntactically absent object is still involved in the compositional

interpretation of the sentence. A cognate object is conceived as an object whose

semantic content is derived from a verb. That is, they claim that the unergative

(intransitive) eat_1 has a cognate object (Cummins and Roberge, 2003). Cummins and

Roberge (2003) conclude that a syntax-driven approach is a simpler and sophisticated

approach that would provide one entry for *eat* and derive the three uses of the verb

from the nature of the object used. They also argue that intransitive verbs can appear

transitively, and that most transitive verbs can alternate between transitive and

intransitive use. That is, verbs can appear both with and without an object complement,

regardless of the verb's semantic content or the semantic relationship between verb and

object; the relationship that holds between an object position and the V head is a

complementation relation. Hale and Keyser (1993, 2002) discuss representation of the argument structure of a verb and argue that that relation is one of classificatory licensing whereby "the verb identifies the complement to some sufficient extent" (2002: 92). They use the term 'hyponymy' to refer to this selectional relation as in (2.4).

(2.4)

```
              V              Hale and Keyser (2002: 93)
             / \
            /   \
    V (dance)  N (dance)
        |
      dance
```
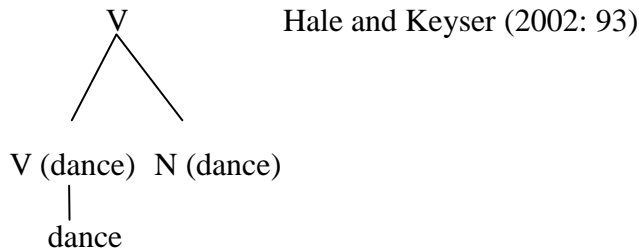
Cummins and Roberge (2003) echo Hale and Keyser's (2002) proposal and also propose that transitivity is best viewed as a universal grammatical property not a lexical property. The variability shown with regard to the realization of objects is due to different options for syntactic derivation. They also discuss some means of recovery (i.e. interpretation) of covert objects, such as linking to an antecedent in the discourse, or recovery by means of features within the VP/IP. In sum, Cummins and Roberge (2003) have argued that the lexicon-driven approach is neither simple nor accurate. They further propose that there is always an overt or covert object in VP, thus eliminating multiple lexical entries for a single verb, and that there are specific syntactic mechanisms to recover the meaning of covert objects.

In this thesis I will assume a syntax-driven approach to object drop. It will be shown that facts concerning different types of object drop in Chinese and English are consistent with the syntax-driven approach, and that differences between two languages can be characterized in terms of syntactic parameters. In these terms we can also deal with learning and unlearning of object drop in anaphoric and non-anaphoric contexts.

2.3 The pro-drop parameter: Types of null subjects

Prior to studying null objects, the null subject or pro-drop parameter is to be firstly reviewed as it has been widely studied. There is a division among the languages of the world such that some languages allow subject pronouns to be null, which other languages do not. This is traditionally discussed under the heading of the null-subject parameter or pro-drop parameter. Null subject languages (NSLs) such as Spanish and Italian allow subjects to be null in finite clauses, and non-null subject languages (non-NSLs) such as English do not allow null subjects in finite clauses. The traditional view, which is discussed and formalized in Rizzi (1982, 1986), is that null subjects depend on rich agreement. Languages have null subject/subject pro-drop if and only if they have rich subject-verb agreement; the null subject is formally licensed and interpreted by virtue of the agreement on the auxiliary or finite verb. However, it was noted early on (Huang 1984) that languages like Chinese and Thai which lack agreement systems also allow null subject and objects. These languages are often referred to as 'radical pro-drop languages' (radical in the sense that not even agreement features are pronounced when the subject is dropped) or as 'discourse pro-drop languages', meaning that the features of the missing subject or object are recovered purely on the basis of the discourse.

The traditional view of subject pro, articulated by Rizzi (1982, 1986), in which pro is an inherently unspecified nominal whose features are supplied by the features of Agr, the phi-features of I(NFL) (i.e. person, number and sometimes gender), cannot be maintained. Holmberg (2005) argues that in the context of a feature theory like that in Chomsky (1995: ch. 4, 2001) the phi-features of I (or T) are themselves uninterpretable (or unvalued), being assigned interpretation (or value) by agreement with the subject, so they cannot specify the value of the subject. Instead, he argues, the null subject pronoun has features just like an overt pronoun. "Following the Chomskyan approach to agreement, the null pronoun has interpretable phi-features and assigns values to the

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inherently unvalued features of Agr. In other words, the null subject pronoun identifies Agr (i.e. the finite verb or auxiliary agrees with the null pronoun), not vice versa." (Holmberg 2005: 548). The nullness is a phonological matter: the features of the pronoun are not spelled out in PF.

Holmberg (2010a) and Roberts (2010b) develop this idea further: If a language has enough phi-features in I/T, a subject pronoun assigning values to those features will end up sharing all its features with I/T. It will be a copy of I/T. As a copy, it can be deleted, i.e. not spelled out. This would be how a null subject is derived in a language with rich agreement. As the phi-features in I/T are so rich, all the features of the pronominal subject are represented in I/T, after valuation. The subject pronoun is a copy of I/T, and as such can be deleted (just like the copy left by movement can be, and usually must be, deleted, under the copy theory of movement; Chomsky (1995: ch. 3, 4). They propose null subjects in agreement pro-drop languages are deleted copies of a phi-feature set in I/T, which itself is derived by agreement with the subject pronoun. Holmberg further discusses a difference between two types of NSLs: consistent NSLs and partial NSLs. As for consistent NSLs like Italian, they have referential agreement, i.e. the phi-features in I/T include the feature [D(efinite)]. This means that a third person null pronoun is necessarily interpreted as definite, hence referential. It cannot be interpreted as indefinite in the manner of the generic pronoun 'one' (in 'One must always be patient'). Therefore they have to have an overt indefinite pronoun to serve as a generic pronoun (see Holmberg 2005, 2010a), thus there are no null generic 3rd person pronouns in such languages. As for partial NSLs like Finnish, they have agreement, but it is not referential, i.e. there is no [D] feature in I/T. The only way they can have a referential third person null pronoun is if it is bound, or controlled, by a higher referential NP. Without such a controlling antecedent, a null third person pronoun will have to be interpreted as generic or expletive. As for discourse pro-drop languages like Chinese, they have no unvalued phi-features in I/T (no subject-verb

agreement) (Holmberg 2005: 559). This means that, much as in partial NSL, a null subject can be interpreted as referential if it is controlled by a referential antecedent in the discourse, or, in the absence of an antecedent, the null subject can be interpreted as generic (Holmberg and Roberts 2012).

Summarizing, consistent NSLs have a [D] feature in I/T, partial NSLs have no [D] feature in I/T, and discourse pro-drop languages have no phi-features in I/T (no agreement), and therefore no [D] feature in I/T. Particularly relevant to the present study is the complementary distribution of referential and generic subject discussed by Holmberg (2005, 2010b). Putting discourse pro-drop languages aside, NSLs have either a null third person singular *referential* subject pronoun (null versions of 'he, she, it'), or a null third person singular *generic* subject pronoun (a null version of generic 'one'). Italian, European Portuguese, Arabic belong to the former type (the consistent NSLs), while Finnish, Brazilian Portuguese and Marathi belong to the latter type (the partial NSLs). This suggests that there may also be a connection between allowing definite null objects and disallowing a generic null object in a language.[6] Prior to testing the complementary distribution related to null objects, I firstly review object drop in Chinese, with the counterparts in English, in anaphoric and non-anaphoric contexts. The following chapter covers object drop in Chinese.

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[6] As mentioned by Holmberg (2005) and discussed by Holmberg and Roberts (2012) this complementary distribution is only found in languages that have subject-verb agreement, hence not in discourse-pro-drop languages like Chinese or Japanese, for example. It is nevertheless interesting as it shows that complementarity of referential and non-referential/generic null arguments exists.

Chapter 3. Object drop in Chinese

In the following I will make a distinction between anaphoric object drop and non-anaphoric object drop.

3.1 Anaphoric object drop and non-anaphoric object drop

In the most general terms, anaphoric object drop means an object is dropped when there is an antecedent in the near context. Consider (3.1),

(3.1)   Zhang   kanjian   zhe zhi xiong le   Mali   ye   kanjian   (Mandarin)
          Zhang   see   this CI   bear ASP Mali   also see
          'Zhang saw this bear. Mary also saw it.'

(3.1) clearly shows that the null object refers to an antecedent *zhe zhi xiong* 'this bear'. Anaphoric object drop is characteristic of Chinese and it is also found in several other East Asian languages such as Thai (see Pingkarawat 1985) and Japanese (see Nakamura 1987). However, this is not found in English. Consider (3.2),

(3.2)   Zhang saw this bear. Mary also saw *(it).   (English)

As for non-anaphoric object drop, it clearly has no anaphor. The following example (3.3) shows non-anaphoric arbitrary cognate object drop in English.

(3.3)   David reads [*e*] every day.

As mentioned in chapter 1, the null object is an 'arbitrary cognate object' because it is a cognate object which does not refer to any specific entity but to some entity (see section 3.4.4 for details). By contrast, an arbitrary cognate object interpretation in Chinese is achieved through the use of a pronounced cognate object. Consider (3.4), a pronounced cognate object *–shu* 'read-book' is required in Chinese and it can refer to written materials such as books or magazines.

(3.4)　　　John zai jia　　kan-shu　　　　　　　　　　　　　　　　(Mandarin)

　　　　　　John at home　read-book

　　　　　　'John reads at home.'

　　　In addition to arbitrary cognate object drop, there is another type of non-anaphoric

object drop: generic object drop. In this case, generic object drop exhibits generic

interpretation, referring to 'people in general' or 'some people'. Rizzi (1986) has

pointed out that Italian has this type of object drop. He posits a syntactically present

null object which refers to the third-person human interpretation, meaning 'people in

general'. Consider (3.5),

(3.5)　　　Questa　musica　rende __ allegri.　　　　　　(Italian) (Rizzi 1986: 507)

　　　　　　*'This　　music　　makes __ happy.'

English and Chinese however do not allow generic object drop and they require a

pronounced object as in (3.6) and (3.7).

(3.6)　　　This music makes *(people) happy.

(3.7)　　　zhe yinyue　　　ling　　　*(ren-men)　　kaixin　　(Mandarin)

　　　　　　this　music　　　make　　*(people)　　happy

　　　　　　'This music makes people happy.'

　　　Summarizing, there are anaphoric object drop and non-anaphoric object drop.

Under non-anaphoric object drop, there are arbitrary cognate object drop and generic

object drop, but I will not discuss generic object drop in this thesis due to lack of space.

I now begin by briefly reviewing previous literature on object drop in Chinese. Then, I

will examine various types of anaphoric object drop. They are distinguished by type of

antecedent and by type of object dropped.

3.2 Previous literature on object drop in Chinese

In anaphoric contexts, an object can drop when there is an antecedent and that specific null object generally refers to a definite antecedent. Chao (1968: 312) points out that "in general an object to a transitive verb is omitted if it has occurred in a near context".[7]

(3.8)	Jintian	de	baozhi	lai	le	ni	yao	kan	ma?	(Mandarin)
	Today	POSS	newspaper	come	ASP	you	also	read	PRT	

'Today's paper has come. Do you want to read it?'

Chao (1968: 701) also notes that "If it is implied in the situation context, no object word needs even to be present in the linguistic context". For example, if one person is washing the dishes, another may say:

(3.9)	rang	wo	lai	ca!	(Mandarin)
	let	me	come	wipe	

'Let me wipe them!' (even though no *dip* 'dishes' have been mentioned.)

Huang (1984, 2009) also points out that an object can be omitted. Consider (3.10),

(3.10)   Speaker A: Zhangsan   kanjian   Lisi le ma?
                     Zhangsan   see   Lisi LE Q
                     'Did Zhangsan see Lisi?'

         Speaker B: ta kanjian   le
                      He saw   LE?
                      'He saw Lisi.'   Huang (2009: 234)

An anaphoric object 'Lisi' can be dropped in a reply from the speaker B in (3.10) and English requires a pronounced object. Yip and Matthews (2007) make the same point when they draw attention to how a null object is understood. They explicitly identify two ways: By recourse to Discourse (explicit) or Speech Context (implicit). By recourse to discourse, a null object refers to an entity which has been explicitly

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[7] A current Chinese pinyin system is used in examples extracted from Chao (1968); there were no glosses in those original versions from Chao (1968).

mentioned in the preceding discourse, such as *ni gin saam* 'this dress' as in the example below:

(3.11)   A: lei   zung-m-zungji   ni   gin saam   aa?   (Cantonese)
                 you like-not-like   this CI dress   SFP
                 'Do you like this dress?'

        B: ngo zungji   aa!   (Cantonese)
                 I   like   SFP
                 'I like [it]!'

<div align="right">Yip and Matthews (2007: 135)</div>

Second, by recourse to speech context (implicit), a null object refers to an entity which is present in the speech context, even though it may not be pronounced explicitly, such as 'gift' as in the example below.

(3.12)   sung bei lei gaa   lei zung-m-zungji   aa   (Cantonese)
            Give   to you SFP   you like-not-like   SFP
            'This is for you.   Do you like [it]?' (A gift is given.)

<div align="right">Yip and Matthews (2007: 135)</div>

3.3 Types of anaphoric object drop

In what follows, I discuss various types of anaphoric object drop in detail. They are distinguished by type of antecedent and by type of object dropped. Anaphoric object drop is classified into two types: (i) specific object drop and (ii) non-specific object drop. Under non-specific object drop, there are: (a) non-specific existential object drop, (b) non-specific generic and (c) non-specific attributive object drop.

3.3.1 Specific object drop

In the following example (3.13a) a null object with specific reference has a definite antecedent *zhe zhi xiong* 'this bear', with a demonstrative *zhe* 'this'.

(3.13a)   Zhang   kanjian   zhe zhi xiong le   Mali   ye kanjian   (Mandarin)
           Zhang   see   this CI   bear ASP Mali   also see
           'Zhang   saw this bear.   Mary also saw it.'

(3.13b) Zhang saw this bear. (The context is that we are looking at a bear.)   (English)

       Mary also saw *(it).   (the same bear)

In the following example (3.14a) Chinese also allows specific object drop but the

antecedent does not have to be definite, and in fact, does not have to be specific.

(3.14a)   Zhang   kanjian yi   zhi xiong le   Mali   ye kanjian   (Mandarin)
           Zhang   see   one   CI   bear ASP Mali   also see
           'Zhang saw a bear.   Mary also saw it.'

(3.14b)   Zhang saw a bear.   (English)

       Mary also saw *(it).   (the same bear)

Here it can be specific in (3.14a), so that it means 'Zhang saw a specific bear' (it's the

one in the zoo), but it can also have a non-specific existential reading: 'There is a bear

such that Zhang saw it' (see 3.16a).

The plural of (3.14a) is

(3.15a)   Zhang   kanjian yi-xie xiong le   Mali   ye   kanjian   (Mandarin)
           Zhang   see   some bear ASP Mali also see
           'Zhang saw some bears.   Mary also saw them.'

(3.15b)   Zhang saw some bears.   (English)

       Mary also saw *(them).   (the same bears).

In this case, the antecedent is taken to be specific in (3.15a). As will be seen below, it

can also be taken to be non-specific existential (see 31.7a).

3.3.2 Non-specific object drop

3.3.2.1 Non-specific existential

In the following example (3.16a) a null object with non-specific reference has an

indefinite antecedent *yi zhi xiong* 'one bear'.

(3.16a)   Zhang   kanjian yi-zhi xiong le Mali   ye   kanjian   (Mandarin)
Zhang   see   one-CI bear ASP Mali   also see
'Zhang saw a bear.   Mary also saw one.'

(3.16b)   Zhang saw a bear.   (English)

Mary also saw *(one).   (meaning 'Mary saw a bear'. It can be a different

bear.)

The plural of (3.16a) is:

(3.17a)   Zhang   kanjian yi-zhi xiong le Mali   ye   kanjian   (Mandarin)
Zhang   see   some bear ASP Mali   also see
'Zhang saw some bears.   Mary also saw some.'

(3.17b)   Zhang saw some bears.   (English)

Mary also saw *(some).

3.3.2.2 Non-specific generic

In the following example (3.18a) a null object with non-specific reference has a

'generic reading': Zhang likes anything which belongs to the *kind* or *species* 'bear'.

(3.18a)   Zhang   xihuan xiong   Mali   ye   xihuan   (Mandarin)
Zhang   like   bear   Mali   also like
'Zhang like bears.   Mary also likes them.'

(3.18b)   Zhang likes bears.   (English)

Mary also likes *(them).

3.3.2.3 Non-specific attributive ('attributive reading of NP')

In the following example (3.19a) a null object with non-specific reference is non-specific in a different sense, and I will call this the 'attributive reading of NP'. It is non-existential; it does not mean that there is a car, and he or she wants it. It might be called a non-referential reading, but in a sense it is still referential. It refers to a hypothetical entity.

(3.19a) Zhang   yao yi-zhe   xin che Mali   ye yao   (Mandarin)
         Zhang   want one-CI   new car Mali   also want
         'Zhang wants a new car.   Mary also wants one.'

(3.19b) John wants a new car.   (English)

         Mary also wants *(one).

To sum up, there are anaphoric and non-anaphoric object drop. Anaphoric object drop is classified into two types: (i) specific object drop and (ii) non-specific object drop. Under non-anaphoric object drop, there are: (a) arbitrary cognate object drop and (b) generic object drop. The following figure 3.1 shows the classification of null objects.

Figure 3.1 Classification of null objects in anaphoric and non-anaphoric contexts
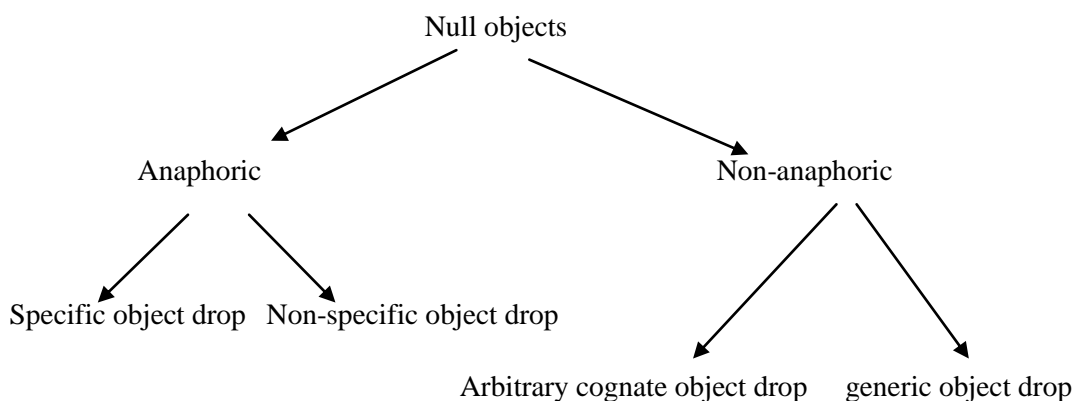
3.4 The derivation of object drop

I turn to study structure of the DP in Chinese and then examine how null objects are licensed, including specific and non-specific ones.

3.4.1 Structure of the DP in Chinese

Huang et al. (2009: 283) show that "bare nouns in Chinese can be interpreted as generic, definite, or indefinite, and can also be interpreted as singular and plural". They argue that the DP in Chinese has the structure of (3.20) as below.

(3.20)

DP Structure in Chinese (Huang et al. 2009)

```
                          DP
                        /    \
                       D      NumP
              pronoun /determiner  /  \
                  ta/ zhe      Num      CIP
                  (s)he/this    |      /   \
                               yi    CI     NP
                                |     |      |
                              one    ge      N
                                 classifier  |
                                            ren
                                          person
```
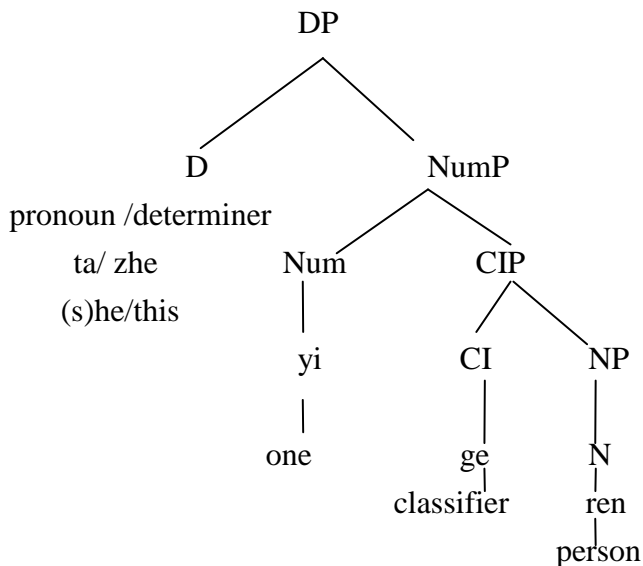
Since D is typically thought to be the locus of reference or definiteness, it should encode all the features related to reference or definiteness. Huang et al. (2009) argue that pronouns are the spell-out features of feature D. A definite article like *the* in English is in the D position, and a pronoun in Chinese also occupies the D position. The DP structure indicates that a pronoun can be followed by number, classifier, and noun which need not be, and typically are not, overt.

3.4.2 Anaphoric specific object drop

Following Phimsawat (2011), I assume that null arguments in discourse pro-drop languages are 'minimal DPs', consisting of just an unvalued D-feature and an N-feature.

(3.21)   [uD, N]

The [uD]-feature needs to receive a referential index as value, for the DP to be interpretable (see Holmberg 2010a). This means that it must have an antecedent.[8] The antecedent has to be an expression with a valued D-feature, i.e. it has to be referential. The valuation can be depicted as in (3.22), where DP needs to be in a local relation to the null pronoun.

(3.22) $DP_i ... [uD, N] \rightarrow DP_i ... [D_i, N]$

Again, consider (3.23) discussed by Huang (1984, 2009). The embedded object [e] may refer only to someone whose reference is fixed outside of the entire sentence, but not to the matrix subject *Zhangsan*.

(3.23) $Zhangsan_1$ shuo   [$Lisi_2$ bu renshi $e_{*1/*2/3}$]
             Zhangsan   say   Lisi not know
             '$Zhangsan_1$ said that $Lisi_2$ did not know [$him_{*1/*2/3}$].'   (Huang 2009: 242)

Instead, to get an antecedent, the null object has to move to the CP-domain of the main clause. In that position it can be coindexed with a referential expression outside the sentence. As discussed in section 3.2, this antecedent is often linguistically expressed, but need not be.

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[8] There is also the case of the generic null pronoun, which is interpreted without an antecedent (see Phimsawat 2011). I will ignore this type of null pronoun in this thesis.

3.4.2.1 An Aboutness topic feature accounts for specific object drop in Chinese

One difference between Chinese and English is that Chinese declarative sentences have

a feature in C which requires a topic specifier. I will call this feature [Aboutness topic]

(see Frascarelli and Hinterhölzl (2007) on the typology of topics). An aboutness topic

is an XP referring to the entity which the sentence is about. As such it is always

referential, always definite, and often has the function of subject. This topic can be an

overt phrase or a null pronoun. Typically this specifier will be the result of movement

from IP, leaving a copy behind (a 'trace' in theories prior to Chomsky 1995), where

this copy is 'deleted', i.e. not pronounced. The specifier may be a null pronoun, with a

null pronoun copy in IP. The null pronoun in spec, CP needs to receive a referential

index from a topic antecedent, and the copy in IP will share this index. There is also an

'EPP-feature' postulated with the Topic feature in Chinese C, which is the formal

trigger of the movement (see Chomsky 1995, 2001). Chinese also has the option of

base-generating a topic in spec, CP with no copy in IP. The following is an example to

illustrate a topic derived by base-generation.

(3.24)   shuigo, wo   zui xihuan   xiangjiao
         fruit,   I   most like   banana
         '(As for) fruits, I like bananas most.'   (Huang et al. 2009: 202)

As for English, it has no general aboutness topic-feature in C. What it has, as an

optional feature of C, is a [contrastive] feature, triggering movement of a

contrast-marked phrase to spec, CP. According to Lambrecht (1994), aboutness topic

represents what the sentence is about, while a contrastive topic has the discourse

function of focus by generating oppositional pairs in relation to a topic. The following

examples show that English does not allow movement of an aboutness topic, and that it

allows the movement of a contrastive topic.

(3.25)   A: Do you like that book?

         B_1:   I like that book.

B$_2$: That book, I like *(but not the other one).

The continuation represents the fact that B$_2$ is grammatical only if the fronted object is construed as contrastive.

(3.26)   A: Do you like it?

        B$_1$: I like it.

        B$_2$: *It, I like (but not the other one).

        B$_3$: *I like.

(B$_2$) is ungrammatical because the pronoun *it* cannot be contrastive.

(B$_3$) is ungrammatical because a null pronoun cannot be contrastive.

In English, when a referential interpretation is forced, a null object is impossible, that is, the topic cannot be dropped in English as shown in the following examples:

(3.27)   Mary's bike has broken down. I am going to repair **e/* it for her.

If this is right, the crucial difference between Chinese and English is that Chinese has a Topic feature in C (coupled with an EPP-feature). The interpretation of a null topic in terms of a topic chain follows from general, universal properties of null topics: a null topic will pick up the index of a local, salient topic in the immediately preceding discourse context, linguistic if there is an immediately preceding linguistic context, non-linguistic otherwise (see Frascarelli and Hinterhölzl (2007)). This makes null definite object pronouns possible in Chinese. Chinese has movement of different types of topics to spec, CP which can be null if it has an antecedent; English only has movement of contrastive topic that cannot be null.

3.4.3 Anaphoric non-specific object drop

Consider anaphoric specific and non-specific object drop in Chinese as in (3.14a) and

(3.14b) and (3.16a) and (3.16b), repeated here.

Specific object drop

(3.14a)   Zhang   kanjian yi zhi xiong le Mali   ye kanjian   (Mandarin)
Zhang   see   one   CI bear ASP Mali   also see
'Zhang saw a bear. Mary also saw it.'

(3.14b)   Zhang saw a bear.   (English)

            Mary also saw *(it).   (the same bear.)

Non-specific object drop

(3.16a)   Zhang   kanjian yi zhi xiong le   Mali   ye kanjian   (Mandarin)
Zhang   see   one CI bear ASP Mali   also see
'Zhang saw a bear. Mary also saw one.'

(3.16b)   Zhang saw a bear.   (English)

            Mary also saw *(one).   (meaning 'Mary saw a bear'. It can be a different

            bear; English would use *one*)

The definite case in (3.14b) can be topic drop as I have discussed earlier. However, the

indefinite case (3.16b) cannot be topic drop because an indefinite DP cannot be topic.

Therefore, the remaining question is how anaphoric non-specific object drop is to be

licensed.

     Huang (1991) claimed that null object construction in Chinese as in (3.28) can be

analyzed as VP-ellipsis in disguise. If the verb is first moved out of VP, and then VP is

elided, by standard VP-ellipsis, then the result is superficially indistinguishable from

object drop (in the case of a transitive verb); this is nowadays referred to as

V-stranding VP-ellipsis and claimed to be found in many languages (see Goldberg

2005). The evidence put forward by Huang (1991) was that (3.28) and (3.29) have the same interpretation.

(3.28) John kanjian le tade   mama   Mary   ye kanjian le.   (Mandarin)
        John see PERF his   mother Mary   also see PERF
        'John saw his mother, and Mary did, too.'

The verb is repeated in the coordinate structure proform corresponding to 'do' in English.

(3.29) John saw his mother, and Mary did [vp   e], too.   (English)

As well known, VP-ellipsis allows a sloppy identity reading, because a deleted VP can contain a variable, assigned a value from outside the VP. Hoji (1998) argues that null object constructions in Japanese cannot be treated as analogous to VP ellipsis in English. He argues that the 'sloppy readings' discussed by Huang are not genuine sloppy readings and that such readings arise because of the way the content of the null argument is recovered. Consider (3.30) and (3.31),

(3.30) A: John-ga   zibun-no   kuruma-o   aratta
            John-NOM   self-GEN   car-ACC   washed
            'John washed self's car.'

        B: Bill-mo ec   aratta
            Bill-also   washed
            'Bill washed ec too.'

(3.31) Bill-mo Bill-no   kuruma-o   aratta
        Bill-also Bill-GEN car-ACC   washed
        'Bill washed Bill's car too.'   (Hoji 1998: 139-140)

Hoji (1998) points out that we would understand (3.30B) to be analogous to (3.31), and it could appear that all sloppy-like readings can be reduced to coreference; however, that is not the case. Consider (3.32),

(3.32)   A: John-ga   zibun-no   kuruma-o aratta
             John-NOM   self-GEN   car-ACC washed
             'John washed self's car.'

         B: John igai-no   subete-no hito-mo (minna) ec aratta
             John except-GEN   all-GEN person-also (all)   washed
             'Everyone other than John also washed ec.'   (Hoji 1998: 140)

Hoiji argues that the sloppy-reading is also possible in (3.32B), but the sloppy reading

cannot be due to coreference since the null argument does not refer to a particular car.

Instead, the sloppy-like reading in (3.32B) seems similar to the sloppy-readings in

(3.33B) and in the English example (3.34B).

(3.33)   A: John-ga   zibun-no kuruma-o aratta
             John-NOM   self-GEN car-ACC washed
             'John washed self's car.'

         B: John igai-no   subete-no hito-mo (minna)   kuruma-o aratta
             John except-GEN   all-GEN person-also (all)   car-ACC washed
             '[Everyone other than John] also washed a car.'

(3.34)   A: John washed his own car.

           B: Everyone else also washed a car.   (Hoji 1998: 140)

Hoji further explains that a bare nominal in Japanese such as *kuruma* 'car' can translate

as any of 'a car', 'the car', 'cars', or 'the cars', and argues that this is because a

nominal projection whose sole content is its head N can be interpreted in various ways

as just indicated. He (1998: 142) proposes that "the content of the N head of the null

argument is supplied by the context of discourse. If the N head that is supplied by the

context is a Name, then it can participate in a coreference relation with another Name".

In addition, the supplied N head can be kuruma 'car' and it can function on a par with

an indefinite in English. He points out that the null argument in Japanese behaves

either like a definite or an indefinite. Tomioka (2003) agrees in part with Hoji's

approach to null arguments in Japanese. Tomioka argues that Japanese lacks obligatory marking of definiteness and plurality on NPs, and therefore bare NP arguments get a variety of interpretations. His main claim is null pronouns in discourse pro-drop languages like Japanese and Chinese are the result of NP-deletion without determiner stranding. This works as follows in section 3.4.3.1.

3.4.3.1 NP-deletion without an overt determiner stranding for non-specific object drop

Jackendoff (1971) described a rule which he called N'-deletion, which strands a genitive phrase, as in (3.35) as below, but cannot strand an indefinite or definite article. In the more current framework of the DP-hypothesis (Abney (1987)), the rule can be redefined as NP-deletion, deleting the complement of D under certain conditions.

(3.35) I have read Peter's book, but I haven't read [$_{DP}$ David's [$_{NP}$ ~~book~~]].

(3.36) *I have edited a book, but I haven't written [$_{DP}$ a [$_{NP}$ ~~book~~]].

(3.37) *I have seen a book, but I haven't had a chance to read [$_{DP}$ the [$_{NP}$ ~~book~~]].

(3.38)

NP-deletion:

```
              DP
             /  \
           XP    D'
                /  \
               D    N̶P̶
```
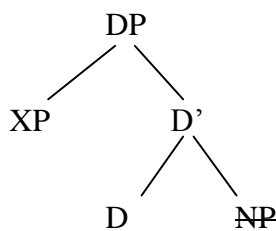
In the case of (3.36), the reason why it is ungrammatical may be morphological: A head which is stranded by deleting its complement has to be morphologically 'strong', capable of standing alone. The indefinite article *a* is morphologically light, hence

cannot be stranded. The corresponding strong form is *one*, which can be stranded by NP-deletion.

(3.39) I have edited a book, but I haven't written [$_{DP}$ one [$_{NP}$ ~~book~~]].

The definite article *the* is also morphologically light, and apparently does not have a morphologically strong counterpart.

Hoji (1998) and Tomioka (2003) argue that discourse pro-drop languages have bare, D-less NP arguments. If NP-ellipsis is applied in such a language, the result is a null argument. For Chinese, it is controversial whether overtly article-less arguments are bare NPs or DPs with a null article. In either case, if NP-ellipsis applies, the result will be a null argument. In a language like English that has overt determiners, these will be stranded by NP-deletion. For instance, in the case of (3.40a), the null object will be a deleted NP *xiong* 'bear', where I assume that there is a null [uD]: [$_{DP}$ [$_{D'}$ uD [$_{NP}$ Ø]]. In English, a DP cannot get an index without a pronounced form, specifically a pronounced D whereas in Chinese, a DP can have an index without a pronounced D (i.e. [uD] gets a value from an antecedent).

Referential index (specific interpretation)

(3.40a) Zhang   kanjian yi zhi   xiong le Mali ye kanjian   e (Mandarin)
         Zhang   see   one CI   bear$_i$ ASP Mali also see   [D$_i$ N]
         'Zhang saw a bear. Mary also saw it.'

Referential variable (non-specific interpretation)

(3.40b) Zhang   kanjian yi zhi xiong le   Mali   ye kanjian   e   (Mandarin)
         Zhang   see   one CI bear ASP Mali   also see   [D$_x$ N]
         'Zhang saw a bear. Mary also saw one.'

As for non-specific and specific object drop, I further assume that [uD] in Chinese can be valued from an antecedent, but it is with a referential index [D$_i$ N] (pronoun 'it') or a referential variable [D$_x$ N] (pronoun 'one'). A specific interpretation is the result

when [uD] is valued by a referential index, whereas a non-specific interpretation is the result when it is valued by a referential variable. In both cases the N of null [uD, N] is recovered by virtue of the overt noun of the antecedent. English cannot have an unvalued null D on the object in these contexts. Instead, English has an overt D, a definite pronoun in the specific case (e.g. *it*), and an indefinite determiner *one* in the indefinite case.

After the above discussion of NP-ellipsis, I will assume that Tomioka is right. Huang (1984) argues that there is a null topic mediating between the antecedent and the null object, but that cannot be so in the indefinite cases (because an indefinite DP cannot be a topic). In the cases of non-specific object drop, they are derived by NP-ellipsis, stranding a null D. In the cases of specific object drop, they are derived by movement, as under Huang's theory of topic drop. Summarizing, there would be two parameters where Chinese and English are different, affecting anaphoric object drop: (a) having or not having an Aboutness topic feature in C, and (b) having or not having a null D.

3.4.4 Arbitrary cognate object drop: Internally-licensed

In non-anaphoric contexts, English allows a null arbitrary cognate object as in *John reads every night*. As stated earlier in chapter 1, I refer to this as an 'arbitrary cognate object' because it is a cognate object which does not refer to any specific entity but to some entity, which, in the case of the verb *read* is a 'readable' object, such as a book or a magazine. Cummins and Roberge (2003) refer to this as internal-licensing, and propose that it is another means to recover the reference of null object within an IP/TP, in addition to the more familiar ones. The internally-licensed null object is not in a relationship with any specific nominal, and it is not an anaphor. Cummins and Roberge

(2003: 9) describe "the internally-licensed null object as a null cognate object (NCO)[9] which is structurally a bare empty noun". NCO is conceived of as an N whose semantic content is derived from the verb. A narrow definition of a cognate object is that it has the same root as the verb which governs it, as in for instance *I smile a happy smile*. A more general definition is that it is an object which shares semantic core features with the governing verb, as in *run a race*, and *ask a question*. Cummins and Roberge (2003) propose that the minimal instantiation of transitivity in a verb is represented in (3.41).

(3.41)

```
        V
       / \
      /   \
     V    N cognate
```
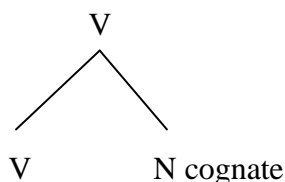
They also note that a null cognate object can be found in languages like French and English (see examples below). The difference between conventionally transitive verbs (e.g. *eat*) and unergatives (e.g. *sleep*) is that a NCO is the more marked object for the former class, and the less marked object for the latter class. In principle, both *eat* and *sleep* can have objects that are semantically dependent of the verb (sharing features with the verb), as in (3.42) and (3.43).

(3.42)
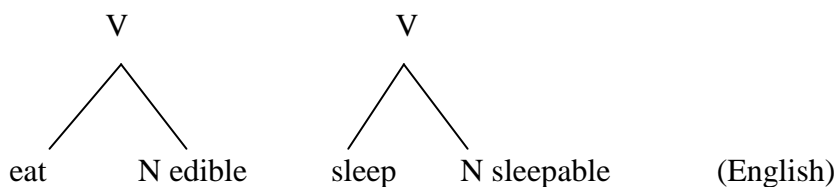
```
        V                    V
       / \                  / \
      /   \                /   \
    eat  N edible       sleep  N sleepable        (English)
```

(3.43)

```
        V                    V
       / \                  / \
      /   \                /   \
   manger  N edible     dormir   N sleepable      (French)
   'eat'                'sleep'
```
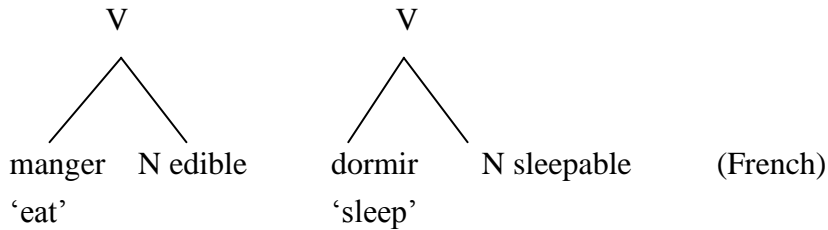
(Cummins and Roberge 2003: 9)

As verbs like *eat* have quite narrowly circumscribed selection restrictions (i.e. the content of the NCO is more or less predictable), the reference of the null cognate object is restricted to something edible, corresponding to the literal meaning of the verb.

As discussed in section 3.2, in Chinese, arbitrary cognate objects have to be pronounced (Chao 1968; Li and Thompson 1986; Cheng and Sybesma 1998). Like English, Chinese exhibits pronounced cognate objects which are derived from the verb such as *xiao yi-xiao* 'smile a smile' (the unergative case discussed by Cummins and Roberge). But with conventionally transitive verbs Chinese differs from English and French in that cognate objects have to be pronounced. Apparently they cannot be internally licensed, in Cummins and Roberge's sense. Cheng and Sybesma (1998) discuss cases of pronounced cognate objects required after a verb in Chinese as in *chi-fan* 'eat-rice', which is equivalent to *eat* in English (also see Matthews and Yip 1994; Ross 1997). They analyze the pronounced object in *chi-fan* 'eat-rice' as a syntactic dummy. 'Dummy' briefly means that the pronounced object adds no semantic content to the verb phrase. It is a bare noun which is a nominal that does not introduce any discourse referent, and the readings that result are generally indefinite, and there is no effect on any particular object though the object is overt. The following are some examples extracted from Cheng and Sybesma (1998).

verbs   - *drink, drive, eat, read*, etc.

Mandarin	**English**
he-jiu	drink
'drink-alcohol'	
kai-che	drive
'drive-car'	
chi-fan	eat
'eat-rice'	
kan-shu	read
'read-book'	

Cheng and Sybesma (1998) propose that the verbs that appear with cognate nouns like those given above are generally the Chinese equivalents of verbs without objects in English. Some other verbs that were not mentioned by Cheng and Sybesma (1998) can also have pronounced cognate objects and they include *hua-hua* 'draw-picture', *yun-yifu* 'iron-clothes', *zhu-fan* 'cook-rice', etc. Chinese requires an obligatory pronounced object in contexts whereas English allows null arbitrary cognate objects.

3.4.4.1 Arbitrary cognate object interpretation

First, I assume that all null arguments in Chinese and English have the same featural composition: [uD, N] (see Phimsawat 2011 on Thai). They have an unvalued D-feature which needs to be assigned a value in the course of the derivation, and a nominal feature which means they can occur in all positions where nominal constituents are found. One way that [uD] can receive a value is by coindexation with a discourse topic, as discussed above (the specific object drop case). Another way is by linking to an indefinite NP-antecedent (the NP ellipsis case). Yet another way is by a rule which interprets the null argument as an arbitrary cognate object (Cummins and Roberge's

'internal licensing'). The rule works as follows. Instead of a full DP object, a verb, for example *read*, can have an object which is a minimal nominal argument as discussed above in section 3.4.2, consisting of just the features [uD, N]. This object is assigned the interpretation of an existentially bound variable restricted by the meaning of the verb, as in (3.44a), where the V' has the structure in (3.44b), and where the object has the reading shown.

(3.44a)   I read every night.

(3.44b)

```
              V'
             / \
            /   \
           /     \
          /       \
         V        [uD, N]
        read      some x (x is readable)
```
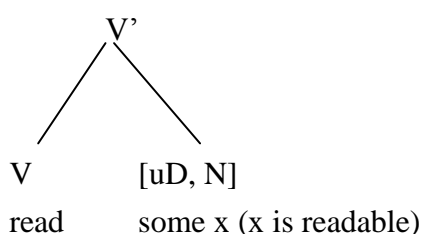
The interpretation of the sentence is therefore as follows, in quasi-logical notation:

(3.44c) For every night y, there is some x (x is readable and I read x at y).

In more ordinary language, (3.44a) means 'I read some written materials every night', and the null arbitrary cognate object refers to any kinds of books, magazines, or newspapers.

Chinese also has arbitrary cognate objects. I assume they have the same structure as in English, and are interpreted by the same rule. However, unlike the case in English, they cannot be spelled out as null. Instead, Chinese has to supply a pronounced object to exhibit the cognate interpretation. For example, *wo kan-shu,* (literally 'I read-book') in Chinese can mean 'I read books or magazines', which is equivalent to *I read* in English. Each arbitrary cognate object has a specific pronounced form.

Mandarin	Cantonese	English
kan-shu	tai-syu	read Ø
'read-book'	'read-book'	

hua-hua	waak-waa	draw Ø
'draw-picture'	'draw-picture'	
yun-yifu	tong-saam	iron Ø
'iron-clothes'	'iron-clothes'	

The pronounced arbitrary cognate objects in *kan-shu* 'read-book', *hua-hua*
'draw-picture' and *yun-yifu* 'iron-clothes' in Mandarin mean 'something readable (any
kinds of written materials)', 'something drawable (any kinds of pictures)', and
something ironable (any kinds of clothes).

The structure and interpretation of, for example, *yun-yifu* is (3.45):

(3.45)
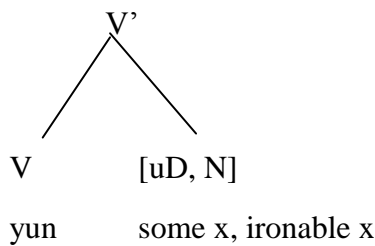
```
              V'
            /    \
           /      \
          /        \
      V         [uD, N]
      yun       some x, ironable x
```

Unlike the situation in English, the object cannot be spelled out as null. Instead,
Chinese has a family of rules of the following format:

(3.46) [uD, N] → *shu/ kan__*

         [uD, N] → *yifu/yun__*

         etc.,

i.e. [uD, N] is spelled out as *shu* 'book' in the context immediately adjacent to *kan*
'read', as *yifu* 'clothes' in the context immediately adjacent to *yun* 'iron', etc. English,
on the other hand, has a single spell-out rule (a rule spelling arbitrary cognate objects
as null):

(3.47) [uD, N] → Ø /_V(*drive, eat, iron, read,* etc.)

I will, from now on, refer to this rule as **the Null ACO rule**.

In addition, I propose that the above data does not deal with a Chinese and English peculiarity or an isolated phenomenon. Chinese-type languages including Korean (J. Lee, p.c.), Thai (S. Yaisomanang, p.c.) and Mundang (Cheng and Sybesma (1998)) do not have rule (3.47), the null spell-out of arbitrary cognate objects. Instead arbitrary cognate objects have a set of spell-out rules, specific to each verb. Many other languages are like English in having null spell-out of arbitrary cognate objects, including French (Cummins and Roberge (2003), Swedish, Finnish (A. Holmberg, p.c.) and Arabic (A. Algryani, p.c.). Summarizing, this is a case of parametric variation of having or not having a null arbitrary cognate object, now regarded as a matter of having or not having the Null ACO rule. English has it and Chinese hasn't. In this sense English has a plus value for the parameter, Chinese a minus value. Due to the contrast regarding this parameter in English and Chinese, a learnability problem concerning L2 acquisition of null arbitrary cognate objects may arise when there is underdetermination in the L2 input (see section 4.1.3). This leads to my first hypothesis: Chinese can acquire a rule, namely the Null ACO rule (3.47), which is not instantiated in L1 (see hypotheses in section 5.1 for details).

3.4.4.2 No-ambiguity of null arguments

Cheng and Sybesma (1998) propose that there is complementary distribution of allowing anaphoric object drop and disallowing non-anaphoric object drop. This underpins the second hypothesis that I am also testing in this study, which I have called the hypothesis of no-ambiguity of null arguments (i.e. one can accept anaphoric object drop or a null arbitrary cognate object, but not both). Cheng and Sybesma do not discuss how such a negative correlation would work, formally. For the sake of argument I postulate a hypothesis in this study: There is a universal condition (3.48) which could be called the no-ambiguity condition on null arguments.

(3.48) No ambiguity of null arguments: A null argument can only have one interpretation.

The null arguments I have discussed until now are nominals with minimal feature content: [uD, N]. Thus an alternative formulation of (3.48), in the present framework, could be (3.49):

(3.49)   [uD, N] can only have one interpretation.

Then languages differ with regard to the interpretation that [uD, N] can have, as follows:

English, French, Swedish, etc.: [uD, N] → arbitrary cognate object

Chinese, Thai, Mundang, etc.: [uD, N] → null topic

Non-specific object drop, as discussed above, would not be instances of [uD, N], but of $[D_i, N]$, where D is specified/valued, having its own referential index, but is a null D in Chinese. Only the noun is anaphoric, being interpreted by recourse to an antecedent.

The alternative hypothesis is that there is no connection between allowing anaphoric object drop and disallowing a null arbitrary cognate object. In that case, we just postulate that Chinese lacks the Null ACO rule spelling out an arbitrary cognate object as null. Instead, it has a set of spell-out rules for arbitrary cognate objects, different for each verb. It also has an aboutness topic feature in C, which English does not have, which triggers movement of objects to spec, CP, including null objects, where they can be linked to an antecedent in the context. Furthermore, Chinese has null articles, while English has spelled-out articles, with the effect that NP-ellipsis results in a null argument in Chinese, but in a stranded article in English. The co-occurrence of these properties would be just a matter of historical accident. Some

degree of ambiguity would be tolerated in this case of null arguments, as in a number of other cases in the grammar (see hypotheses in section 5.1).

3.5 Summary

In this chapter, I have reviewed object drop and object realization in anaphoric and non-anaphoric contexts in Chinese, with the counterparts in English. Particularly, structure of the DP in Chinese and types of anaphoric object drop in Chinese were also examined. Finally, two types of anaphoric object drop in Chinese were studied: anaphoric specific and non-specific object drop. Both anaphoric specific and non-specific object drop were analyzed to be due to the existential state of an antecedent. As for the derivation of object drop, I firstly assume that all null arguments in Chinese have the same featural composition: [uD, N]. They have an unvalued D-feature which needs to be assigned a value in the course of the derivation, and a nominal feature which means they can occur in all positions where nominal constituents are found. I explain that [uD] in Chinese can be valued from an antecedent, but it is with a referential index $[D_i \, N]$ or a referential variable $[D_x \, N]$. In other words, a specific interpretation is the result when it is with a referential index, whereas a non-specific interpretation is the result when it is with a referential variable. In non-anaphoric contexts, there is no antecedent that an object argument can refer to, and an overt object in Chinese is required. An overt cognate object is needed when conveying arbitrary expression in Chinese. Due to the contrast in the use of null arbitrary cognate objects in English and Chinese, one hypothesis that I am testing in this study, Hypothesis 1a, is that Chinese can acquire a rule, the Null ACO rule (3.47), which is not instantiated in L1. The alternative hypothesis, Hypothesis 1b, is that Chinese cannot acquire the Null ACO rule. In addition, I have discussed Cheng and Sybesma's (1998) hypothesis and I put the hypothesis of no-ambiguity of null

arguments to the test. Hypothesis 2a is that either anaphoric object drop or a null arbitrary cognate object is accepted, but not both. The alternative Hypothesis 2b is that some degree of ambiguity of null arguments can be tolerated and both anaphoric object drop and a null arbitrary cognate object are accepted.

Chapter 4. UG constrained SLA Theories and Studies

4.1 UG constrained SLA theories

Evidence of marked variability in SLA attainment has led to different acquisition theories developed by researchers in the generative SLA field. They are particularly interested in finding out whether adult L2 learners transfer their L1 mental grammar at the initial state, and whether they, partially or fully, have access to UG with respect to new parameter settings or feature settings. One main interest of the UG approach for SLA studies is to provide a descriptive framework which enables researchers to formulate well-defined hypotheses about L1 and L2 representation and L2 acquisition in a focused manner. Predictions about route and rate of acquisition and effects of transfer or access to UG can be made after the parameter or feature settings in both L1 and L2 languages are compared and analyzed. In this empirical SLA study, I compare and analyse targeted aspects of grammar in L1 and L2 which I argue require access to UG for successful acquisition of L2 parameter settings. There are several competing theories including (i) Full Transfer/Full Access (Schwartz and Sprouse 1994, 1996), (ii) Full Transfer/Partial Access (Tsimpli and Roussou 1991; Hawkins and Chan 1997) and (iii) Partial Transfer/Full Access (Vainikka and Young-Scholten 1994, 1996a).[10] As theories about UG access developed, White (2003:17) comments that "interest began to shift from overarching questions like "What kind of UG access is there in L2" to a closer examination of the nature of the interlanguage grammar". White (1989, 2003) concludes that UG still constrains L2 acquisition, specifying that non-native grammar is interlanguage grammar. She (2003: 1) suggests that "the linguistic behavior of non-native speakers can be accounted for in terms of interlanguage grammars which are constrained by principles and parameters of UG". Interlanguage grammar is

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[10] There are more nuanced theories that have emerged in very recent years, in line with minimalist approaches, such as feature reassembly (see Lardiere 2008, 2010). Lardiere argues that language variation is seen to have their origins in differences in feature combination.

typically defined as the non-conscious underlying linguistic system of an L2 learner (e.g. see Selinker 1972; White 1989, 2003; Yip 1995). In this present study, one research question is to find out if there is an interlanguage grammar where a null anaphoric object and a null arbitrary cognate object are accepted (see section 2.1). Another question is to investigate whether there is a connection between unlearning anaphoric object drop and learning a null arbitrary cognate object in L2 English. In order to set the context for these questions, I therefore review some previous SLA studies related to unlearning anaphoric object drop by Chinese learners of English. Those SLA studies include Yuan (1997) and Jiang (2009) and their empirical studies are discussed in relation to the theories of (i) Full Transfer/Full Access or (ii) Full Transfer/Partial Access.[11] Prior to conducting review of empirical SLA studies, I now turn to review the two above-mentioned UG constrained SLA theories.

4.1.1 Full Transfer/Full Access (Schwartz and Sprouse 1994, 1996)

Under Schwartz and Sprouse's (1994, 1996) Full Transfer/Full Access, the initial state in SLA is a particular grammar. They propose that the initial state grammar equals the steady state or end state grammar of a learner's first language. Full transfer indicates that the entire grammar of learners' first language will be transferred to their initial L2 grammar. After the initial state, learners start developing their interlanguage grammar on the basis of input by accessing UG and then resetting their parameters for L2, where they differ from L1. As for full access, it means that L2 learners have recourse to all aspects of UG available to L1 learners, and can make use of them to reset any parameters in L2. According to White (2003: 61), "when the L1 grammar is unable to

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[11] Another principal UG constrained SLA theory is Partial Transfer/Full Access (Vainikka and Young-Scholten 1994, 1996a). Vainikka and Young-Scholten (1994, 1996a) propose their Minimal Trees Hypothesis (now Organic Grammar) which considers the initial state as a grammar, and L1 as playing a key role in the formation of the initial state grammar. However, they differ in hypothesizing that only L1 lexical categories are transferred and that functional categories (e.g. the inflectional phrase (IP)) are not.

accommodate properties of the L2 input, the learner has recourse to UG options not instantiated in the L1, including new parameter settings, functional categories and feature values…". Whilst numerous SLA studies argue for Full Transfer/Full Access (e.g. Yuan 1998; Slabakova 2000), other studies argue against this hypothesis because it fails to account for why native or near native competence of L2 learners is (arguably) not found, as it should be if UG is fully accessible (e.g. Hawkins and Chan 1997).

4.1.2 Full Transfer/Partial Access (Smith and Tsimpli 1995; Hawkins and Chan 1997)

Tsimpli and Roussou (1991) argue that L2 learners are unable to reset parameters. When the L1 and L2 parameter values are different, L2 will be unattainable as a result. This position was further developed by Smith and Tsimpli (1995) who focus on the parameterization of functional categories. They claim that L2 learners cannot acquire new functional categories or features after the end of a critical period. They argue that the critical period for language ends at puberty. After this period of time, "maturational constraints" (ibid: 24) mean the brain no longer has the adaptability found at earlier stages of biological development. They argue (ibid) that there may be access to UG but no possibility of parameter-resetting for adult learners, evidenced by the difficulties found by L2 learners in resetting parameters or to acquiring new parameters. Hawkins and Chan (1997), on the other hand, in their Failed Functional Features Hypothesis (FFFH), take a less extreme position: they propose that L2 learners have different mental representations from those of native speakers only in specific respects. Under the FFFH, they claim that certain subcomponents of UG are inaccessible to L2 learners, while others are fully available. In the case of learners whose L1 have functional feature specifications that are different from those of L2, it is not possible under the FFFH for an L2 learner to be native-like. In Hawkins and Chan's (1997) study, they focus on the extent to which L2 Chinese can acquire English operator movement in

restrictive relative clauses when Chinese is said to lack the strong [wh] feature triggering this movement. The FFFH predicts that there would be significant differences between the Chinese and French speakers at comparable English levels and ages, because Chinese speakers lack the required [wh] feature, and are in principle unable to learn it, but French speakers have it. They conclude that it is not possible for an L2 learner to reach native-like attainment in the L2 syntax due to a deficit relating to L1 transfer. Hawkins (2003, 2005) extends the FFFH, proposing that L2 learners can acquire interpretable syntactic features; however, uninterpretable syntactic features still remain problematic for L2 learners. He argues that L2 learners are subject to a critical period affecting uninterpretable features. The uninterpretable features, after the critical period, are still inaccessible for acquisition. This is called the Representational Deficit Hypothesis (RDH). In other words, features and categories instantiated in the L1 are always available to the L2 learner, as are interpretable syntactic features absent from the L1, but uninterpretable syntactic features that are absent from the L1 cannot be acquired. To conclude, Smith and Tsimpli (1995) and Hawkins and Chan (1997) reject the idea that there is the full access to UG after the critical period, arguing instead for partial access.

The above UG constrained SLA theories have been advanced by different researchers with various research findings. However, there is still no consensus on what extent L2 learners transfer their L1 to L2 grammar, and whether they have access to UG. The present SLA study sets out to investigate the acquisition of a null arbitrary cognate object which is not instantiated in L1 for L2, aiming to shed some light on L2 acquisition and specifically on access to UG.

4.1.3 Poverty of stimulus and the notion 'access to UG in L2'

It is clear from the competing models alluded to above that 'access to UG in L2' remains a contentious issue and needs clearly defining. More specifically, how do we know whether L2 acquisition of a grammatical property requires access to UG? White (1989: 45) states that "When one considers the L2 acquisition task and the assumed complexity of the grammar attained by successful L2 learners, this grammar appears to go far beyond the input, suggesting that there must be something like UG guiding L2 acquisition." I now point out that access to UG in L2 must be postulated if and only if a grammatical property is acquired in L2 for which there is underdetermination in the L2 input[12] and no explicit instruction. That is to say, access to UG must be assumed when there is learning under poverty of the stimulus.

The poverty of the stimulus argument was first proposed by Noam Chomsky (1980) in his work *Rules and Representations,* in the context of first language acquisition (see Chomsky 1981, 1995; M. Thomas 2002)). The essential idea is that human beings must have innate linguistic capacity that provides additional knowledge to language learners when the input is relatively limited (Smith 2004)). Lakshmanan (1994: 3) points out that "while the child must necessarily be exposed to input before language acquisition can take place, the input data that are available are deficient in that they do not provide adequate information about complex structures in the language for the child to acquire these on the basis of the input alone". Lakshmanan (ibid: 5) further states, "Adult L2 learners, like child L1 learners, have to determine the complex properties of the grammar of the target language on the basis that there is insufficiently rich and precise input". In generative L2 research, proponents of the access to UG hypothesis heavily rely on the assumption that the poverty of stimulus applies to both L1 and L2 acquisition (White 1985; Flynn 1987; Cook 1988; White

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[12] The term 'underdetermination [in the input]' was adopted in White (1989: 38). She (1989: 38-39) also used other equivalent phrases including 'far beyond the input' or 'improvised input'.

1989; Schwartz 2004). Specifically, Schwartz (2004: 97) states that "poverty of stimulus effects do exist as the "conceptual core" of generative grammar and as a fundamental insight into the nature of both first and second language acquisition." Schwartz and Sprouse (2000: 158) explain that "in order to determine whether UG continues to constrain (adult) L2 acquisition, an attempt must be made to exclude the possibility that so-called UG effects are the result, in actuality, of the L1 grammar". They also argue that we must rule out the possibility of learning on the basis of explicit instruction or by means of general learning principles. White (2003: 23) also concludes that "to demonstrate convincingly that the interlanguage grammars are constrained by principles of UG, the following conditions should hold:

(4.1) *The phenomenon being investigated must be underdetermined by the L2 input. That is, it must not be something that could be acquired by observation of the L2 input, including statistical inferencing based on frequency of occurrence, on the basis of analogy, or on the basis of instruction.*

(4.2) *The phenomenon should work differently in the L1 and L2. That is, it must be underdetermined by the L1 grammar as well. In this way, transfer of surface properties can be ruled out as an explanation of any knowledge that L2 learners attain.*

White (2003: 23)

White's (2003) proposed conditions above provide a suitably precise remit for investigating the notion of 'access to UG in L2', so I will relate my analysis to them when discussing what the results of my investigation imply for theories of SLA in chapter 7. It should be noted that assessment of the poverty of the stimulus in the case of a particular grammatical feature F is typically, or even always, based on assessment

of the *probability*[13] that F could have been acquired by observation of the input. Short of recording every minute of a person's life, we typically cannot *know* that there has not been some additional crucial input provided relevant to acquisition of F. Nevertheless, if we know that evidence of F is exceedingly rare in the primary data, then the probability that a learner has acquired F solely on the basis of input is correspondingly low. If not just one, but a group of learners, have independently acquired F, then the probability that they have all had access to the relevant input may be so low that we can legitimately assume that F is not acquired solely on the basis of input, and therefore that F is argued to be acquired on the basis of UG. This reasoning will be relevant when discussing the implications of my results in chapter 7.

4.2 Previous SLA studies on the acquisition of objects in L2 English by Chinese

I now turn to review previous SLA studies on acquisition of objects in L2 English by Chinese in order to further contextualize the research questions of this study. To my knowledge, there is no previous research on the acquisition of null arbitrary cognate objects in non-anaphoric contexts in L2 English by L1 adult Chinese (e.g. *Mary reads [e] every night*). Thus, I only focus on some studies on acquisition of objects in anaphoric contexts. As for acquisition of objects in L2 English by Chinese, there have been some studies that have investigated to what extent Chinese had difficulties in acquisition of objects in English (see Fuller and Gundel 1987; Zobl 1994; Yuan 1997;

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[13] Alongside the UG approach to language acquisition, there have been numerous studies developing a statistical probability approach to language acquisition (Saffran, Newport & Aslin, 1996; Seidenberg, 1997; Seidenberg & MacDonald, 1999). It should also be noted that some studies argue that both UG and statistical probability approaches are involved in language acquisition. Specifically, Yang (2004: 455) argues that "There is evidence that statistical learning, possibly domain-general, is operative at both low-level (word segmentation) as well as high-level (parameter setting) processes of language acquisition". In this study, I also assume that both statistical probability and UG play a role in language acquisition.

Jiang 2009). Fuller and Gundel (1987) investigated the role of topic-comment structure in the acquisition of English as a second language by adults. In their study, Chinese participants were asked to tell a story in English to a native English speaker after viewing a film. Their findings revealed that Chinese learners of English allow both null subjects and null objects in their oral production. They pointed out, however, that there were few null pronouns in subject position, and what they found were in object position (e.g. *He win a golden fish – he is very happy and (great). He take ∅ and he put ∅ in a glass bowl.*) They conclude that anaphoric object drop in the interlanguage data could be due to L1 transfer. Zobl (1994) also found that some Chinese accepted null subjects and objects in a judgment task, with the acceptance rate being rather higher for null objects (e.g. *She looked for her key, but she couldn't find *(it) anywhere*.). The native English speakers group rejected ungrammatical English sentences with null objects at a rate of 80%, whereas Chinese rejected them only at a rate of 43.8%. These results support the claim that the null objects at issue are the product of L1 transfer. In what follows, I only focus on Yuan (1997) and Jiang (2009) because Yuan (1997) was the first systematic study on acquisition of objects in L2 English by Chinese and Jiang (2009) was a recent SLA study related to acquisition of objects by Chinese. Those two studies will be reviewed in more detail because they are most relevant for my research on unlearning anaphoric object drop.

4.2.1 Yuan (1997)

Yuan (1997) was the first systematic study of the null object phenomenon in L2 English by Chinese. His study (1997) set out to examine systematically intuitions about null subjects and objects in the L2 English of 159 Chinese at different levels of proficiency, and to understand if Chinese might acquire subjects more successfully than obligatory objects, and if so, why. His research instrument consisted of an acceptability judgment test. Nine sentence structures were used to test whether Chinese

were aware that L2 English does not allow null subjects in finite sentences or null objects in any sentences. Four sentence structures related to null objects were developed. All null objects were anaphoric specific null object in all test items (Yuan 1997: 480):

Inanimate null object in matrix sentence:
(4.1) Mary's bike has gone wrong. Tomorrow I am going to repair *(it) for her.

Inanimate null object in embedded sentence:
(4.2) Mary lost her bike last week, but John says the police have found *(it) for her.

Animate null object in matrix sentence:
(4.3) I immediately recognized the students, and later Mary also recognized *(them).

Animate null object in embedded sentence:
(4.4) John said those students were in the library, but I told him I didn't find *(them) there.

Yuan found that all of the groups including the most advanced English group were significantly worse at rejecting null objects than the native English controls. To account for the difficulty in unlearning null objects in L2 English by Chinese, he adopted Huang's (1984) theory of the topic chain in his explanation of null objects. In relation to topic drop in Chinese, I have discussed an aboutness topic feature that accounts for anaphoric specific object drop in Chinese in section 3.4.2. I propose that English has no general aboutness topic-feature in C. What English has, as an optional feature of C, is a [contrastive] feature, triggering movement of a contrast-marked phrase to spec, CP (see section 3.4.2.1). As for Yuan's (1997) study, he assumes that Chinese transfer the obligatory [topic] feature of C into their L2 grammars for English. Hence, Chinese could allow null topics identifying null subject and objects in their English grammar. However, he proposes that noticing that English has verbal inflections leads Chinese to understand that English Infl cannot license subject *pro*. The triggering evidence includes the verbal inflections for tense and agreement, use of

copulas and auxiliaries, etc. (Yuan 1997: 489). Therefore the Chines allow null objects but not null subjects. Yuan concludes that there is a lack of evidence in the input to unset the [+topic-drop] setting, required for unlearning anaphoric object drop; therefore Chinese acquire obligatory subjects faster than obligatory objects.

4.2.2 Jiang (2009)

A more recent study about acquisition of objects in L2 English by L1 Chinese, Jiang (2009), reconsidered Yuan's findings investigating whether Chinese can acquire the obligatory status of English objects. Jiang's (2009) study also covered the acquisition of the local binding characteristics of English reflexives, but I only review her findings related to the acquisition of English objects here because that is what I am most concerned with in my study. In Jiang's study, she considered knowledge of the possibility of anaphoric object drop in L2 focusing specifically on Chinese with advanced English proficiency. There were 48 adult Chinese with English as their foreign language and eight native English controls. A grammaticality judgment task using a wider range of structures than Yuan's was conducted to test whether Chinese were aware that L2 English does not allow null objects. All null objects were anaphoric specific null objects and the test item structures included:

Coordinate structure:
(4.5) I want to borrow that book from her, but she says she is using *(it) at the moment.

Question-answer dialogues:
(4.6)   A: Can I use your computer?

            B: The computer has gone wrong and you won't be able to use *(it) now.

From a theoretical perspective, Jiang assumed the full transfer and limited access account of Hawkins (2005) Representative Deficit Hypothesis (RDH). She adopts the

topic-drop analysis of null objects in Chinese. She argues that topics are assumed to be located in the specifier position of CP (see Rizzi 1997), where the head C bears an uninterpretable topic feature [u Top] which is checked by a constituent with an interpretable [Top] feature under c-command (Jiang 2009: 111). She suggests that English shares with Chinese the property of having a strong optional [u Top] feature in C, which motivates object movement to Spec of CP for feature checking purposes. However, Chinese C licenses a null specifier whereas English does not, and this makes topic-drop possible in Chinese.

The results of the experiment on null objects reveal that Chinese, like native English controls, readily accepted the grammatical sentences in both the coordinate structures and question-answer dialogues. However, in judging the ungrammatical sentences, Chinese failed to detect the ungrammaticality of English sentences with null objects. She argues that some Chinese found difficulties in acquiring obligatory objects in English. She concludes that the result was unexpected in light of the RDH. This hypothesis proposes that only features and categories instantiated in the L1 are available to the L2 learner, and syntactic features, parameter values, and rules absent from the L1 will not be acquirable. Given that a [Top] feature is available in both Chinese and English, Jiang argues that it is available for transfer from the L1 grammar to L2 English. However, the result of her study has revealed that Chinese have difficulties in unlearning null objects in L2. The findings in her study also concur with Yuan (1997), arguing that there is L1 transfer of the null topic, and that Chinese therefore have difficulty in unlearning anaphoric specific object drop.

4.3 Summary

In this chapter, principal UG constrained SLA theories and empirical SLA studies related to acquisition of objects in anaphoric contexts by Chinese learners of English have been reviewed. Specifically, Yuan (1997) and Jiang (2009) examined acquisition

of anaphoric specific objects in L2 English by L1 Chinese. The results of both studies show that Chinese with advanced English proficiency have difficulties unlearning anaphoric object drop. They argue that the reason for this is L1 transfer of topic drop. In addition, I noticed that their studies were about unlearning anaphoric specific object drop with respect to target verbs that do not allow a null arbitrary cognate object (e.g. *repair*, *buy*). This chapter also covers discussion of L2 acquisition and the poverty of stimulus, and the notion 'UG access in L2' within a generative framework. In what follows, chapter 5 covers all research questions and methodology in detail.

Chapter 5. Research questions and methodology

5.1 Research questions and hypotheses

Previous studies in SLA (Yuan 1997; Jiang 2009) suggest L1 transfer problems for Chinese learners of English who have difficulties in unlearning anaphoric object drop in English. English generally requires an overt object in anaphoric contexts whereas Chinese allows object drop when there is an antecedent. According to Huang (2009: 249), Chinese object drop is argued to be due to Topic Deletion, operating at discourse level to delete the topic of a sentence identified with a specific topic in a preceding sentence. I assume that this is right in the case of anaphoric specific object drop. It cannot be the case with anaphoric non-specific object drop (see section 3.4.3). In non-anaphoric contexts, however, English allows a null arbitrary cognate object [*e*] as in *Mary reads [e] every night* whereas Chinese requires a pronounced arbitrary cognate object *shu* 'book' (Li and Thompson 1981; Cheng and Sybesma 1998; Yip and Matthews 2007). With regard to the contrast in object drop in non-anaphoric contexts, one purpose of this study is to investigate acquisition of null arbitrary cognate objects in L2 English by adult Chinese, according to the hypothesis of acquisition of the Null ACO rule (see section 3.4.4.1). Another purpose is to test the hypothesis of no-ambiguity of null arguments (see section 3.4.4.2). In this present study, I formulated the following three research questions and two hypotheses:

Research Questions:

RQ 1. To what extent can Chinese learners of English learn non-anaphoric object drop, specifically null arbitrary cognate objects?

RQ 2. To what extent can Chinese learners of English unlearn anaphoric object drop? Do they interpret a null arbitrary cognate object as discourse-linked anaphoric object drop?

RQ 3. Is there a correlation between learning non-anaphoric object drop and

unlearning anaphoric object drop? Is there an interlanguage grammar where

both types of object drop are accepted?

Hypothesis 1a: Chinese can acquire the Null ACO rule which is not instantiated in L1.

(RQ 1)

The alternative hypothesis 1b: Chinese cannot acquire the Null ACO rule.

Hypothesis 2a: there is no ambiguity of null arguments. (RQ 3; data from RQs 1 and 2)

The alternative hypothesis 2b: some degree of ambiguity of null arguments can be

tolerated.

These three research questions formed the basis of the research methodology, with

associated empirical hypotheses (discussed in more detail in the findings chapter,

sections 6.2 forwards). I now turn to focus on research methodology, pilot test

feedback, data collection procedure, choice of target verbs and distractors in the

following sections.

5.2 Research methodology

In this empirical study, three research tasks were developed. They were: (i) an oral

task[14], (ii) a written task[15] and (iii) an acceptability judgment and interpretation test

(AJIT). The purpose of adopting more than one method was to triangulate the findings

obtained. Johnson (1992: 146) notes that triangulation enhances the validity and

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[14] This task was named as an oral task because it aimed to elicit oral production data consisted of a set
of verbal prompts (see section 5.7.1).

[15] This task was named as a written task because this paper-based task aimed to elicit written production
data. Participants were tested to produce from nothing to three words maximum in the experimental
settings (see section 5.7.2).

reliability of the information, and hence both oral and written tasks in this study were used to elicit data on learning null arbitrary cognate objects in L2 English by L1 Chinese. The entire experiment took approximately 60 to 90 minutes to complete, it was on a one-to-one basis. Prior to the main study, two pilot tests were conducted with two Chinese and one native English speaker in each pilot test. Pilot tests were mainly designed to uncover any problems related to task design and task instructions. Results of the pilot test were not reported because the number of test items was not highly significant enough to draw any robust empirical conclusion, but feedback on task design and instructions was targeted for finalizing all research tasks in the main study. Therefore, modifications on task design and instructions were made in the main study accordingly after due consideration. Those main modifications are listed as below.

5.3 Pilot test feedback for the main study

5.3.1 No picture effect

For both oral and written tasks in the pilot test, a picture showing an object was initially given in each test item. For instance, when participants were tested on making a sentence with a target verb *drive,* a picture of a man who drives a car was given (see figure 5.1). Some participants, after completing the pilot test, raised an issue that the picture of an object 'car' may have triggered their use of the word *car* in their utterance *David drives his car all working day*. As the research tasks primarily aim at eliciting participants' linguistic competence of acquiring a null arbitrary cognate object, the use of a picture showing a targeted object which may trigger the use of an object argument therefore must be avoided. Ultimately, no picture was given in all tasks in the main study. It should be noted that the limitations with generative SLA research in being able to tap into the somewhat abstract Chomskyan notion of linguistic competence[16]

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[16] Chomsky (1965) first drew the distinction between competence and performance. Chomsky (1965: 3) points out that "Linguistic theory is primarily concerned with an ideal speaker-listener, in a completely

as distinct from performance through such measures are of course widely recognised (White 1989, Schutze 2005, Whong and Wright 2013). Nevertheless, as White (1989: 57-58) points, out: "…various aspects of linguistic performance can give insights into competence. Some aspects of performance are more revealing than others, and are amenable to experimental manipulation which can help in determining the nature of the L2 learner's underlying knowledge". I therefore designed the following tasks to be the most effective possible in eliciting a reliable picture of underlying competence, but bearing these limitations in mind.

Figure 5.1 A sample picture (showing an object 'car') used in the oral task in a pilot test

Pilot Test: Picture Description

Look at the picture below, and make a sentence with all words given. Then, read your sentence aloud.

What happens to David?

(1) drive / all working days
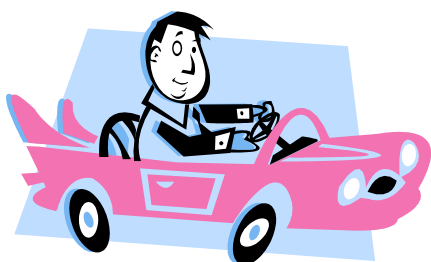
(Source of the picture above: from Clip Art, Picture Tools, Microsoft Word.)

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homogeneous speech community who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of language in actual performance. He (ibid: 4) further concludes that "We thus make a fundamental distinction between competence (the speaker-hearer's knowledge of the language) and performance (the actual use of language in concrete situations).

5.3.2 Clarity of task instructions

The written task in a pilot test was firstly named as 'Fill-in-the blank' and participants were asked to complete a sentence with any necessary words as in *We are unwilling to pay someone HK$ 60 an hour to iron _____.* Participants were instructed to put an 'X' above the line if they agree that no word was needed. After the pilot tests, some participants raised a point on wordings used for task instructions such as *Fill-in-the-blank* and *necessary words*. They pointed out that those wordings were ambiguous and even misleading to them when judging whether an overt object should be supplied. Some explained that they supplied an overt object like *clothes* after *iron* because they thought the name of this task is *Fill-in-the-blank*, and the word *necessary words* may also have led them to think it was also required to supply an overt object. Hence, the *necessary words* were not used and the task name was consequently simply named as *written task*. The written task instructions were revised to be clearer, so in the main study, these were as follows:

Written task: Instructions

- If you find that a sentence is INCORRECT, fill in the blank with appropriate words (maximum of 3 words).

- If you found that a sentence was CORRECT, <u>do NOT put any words in the blank,</u> just put a '√'.

5.3.3 Comprehensibility of lexical items

To reduce the chance of lexical items, rather than syntax, influencing participants in this present study, vocabulary in all tasks were kept to a simple level for all Chinese participants, particularly those at a high-beginner level of English (the lowest English level in this study). I therefore arranged two Chinese at a high-beginner level of English to attempt all tasks and then to comment on what lexical items were incomprehensible. No lexical items were found to be incomprehensible to those two

Chinese participants. This was taken as evidence that lexical items, rather than syntax, were unlikely to influence participants in the main study.

5.4 Data collection procedure

An oral task was administrated prior to the written task, and an acceptability judgment and interpretation test was finally conducted. This order was used according to the expected length of task completion time, starting from the shortest to the longest. Participants were expected to take approximately 5-10 minutes to finish the oral task first and this made participants feel comfortable about continuing the whole experimental studies. The completion time for the second written task was about 10-20 minutes and the last AJIT was approximately 45-60 minutes long. Participants completed all three research tasks within 60-90 minutes. All tasks were completed on a one-to-one basis in a quiet area so that participants could focus on completing all tasks and quality sound recordings could also be made. All participants' oral production were recorded and later transcribed into English. There was no time limit for any single task, but participants were told to work as quickly and as accurately as they can.

5.5 Target verbs and distractors

As discussed in section 3.4.4, Cheng and Sybesma (1998) have a list of an equivalence of overt cognate objects in Chinese to null objects in English. I adopted three verbs from the list (*drink(-alcohol), drive(-car)* and *read(-book)*) and added two other verbs (*draw(-picture)* and *iron(-clothes)*). In total, there are five target verbs in this present study.

Target verbs:

Mandarin	Cantonese	English
hua-hua	waak-waa	draw Ø
'draw-picture'	'draw-picture'	

he-jiu	jam-zau	drink Ø
'drink-alcohol'	'drink-alcohol'	
kai-che	zaa-ce	drive Ø
'drive-car'	'drive-car'	
yun-yifu	tong-saam	iron Ø
'iron-clothes'	'iron-clothes'	
kan-shu	tai-syu	read Ø
'read-book'	'read-book'	

All target verbs had the following properties:

1. In non-anaphoric contexts, target verbs can take a null arbitrary cognate object (object drop) in English whereas they require an overt cognate object in Chinese, and

2. In anaphoric contexts, target verbs have to take an overt object in English whereas they can take a null anaphoric object (object drop) in Chinese.

There were five distractors in the written task and AJIT: *buy, find, promote, repair* and *use*. Three distractors, namely *find, repair* and *use,* were used in previous SLA studies on acquisition of objects (e.g. Yuan's (1997) study). Two other distractors, *buy* and *promote,* were carefully selected so all distractors had the following properties:

1. In non-anaphoric contexts, distractors cannot take a null arbitrary cognate object in English (e.g. *The charity's aim is to help local unemployed youngsters find ___.); however,

2. In anaphoric contexts, distractors have to take an overt object in English (e.g. David said those students were in the canteen, but I told him I didn't find *(them) here).

The following are illustrations of (a) one target verb (e.g. *iron*), and (b) one distractor (e.g. *find*) in both anaphoric and non-anaphoric contexts in Chinese and English:

(a) Target verb: e.g. *iron*

(i) Non-anaphoric contexts: An overt object in Chinese and a null object in English

(5.1)   (Cantonese)

Ziksan giu Mali   tong   keoige   saugan   Mali waa ngo m bong keoi **tong saam**

Jason   ask Mary iron   his   handkerchief Mary said   I not for him **iron clothes**

Jason asked Mary to iron his handkerchief.   Mary said, "I don't **iron** [*e*] for him."

(ii) Anaphoric contexts: A null object in Chinese and an overt object in English

An anaphoric specific object in English

(5.2)   (Cantonese)

Ziksan giu Mali   tong   keoige   saugan   Mali waa ngo m bong keoi   **tong**

Jason   ask Mary iron his   **handkerchief** Mary said I   not for him   **iron   [*e*]**

'Jason asked Mary to iron **his handkerchief**.   Mary said, "I don't **iron his handkerchief**/ **it**."

An anaphoric non-specific object in English
(5.3)   (Cantonese)
Ahje zungji hai   gonggung tousyugun tai maanwaa   syu   keoi   hai ukkei m
tai   [*e*]
Granddad like in   public   library   read **comic book**   he   at home   not
read
Grandad likes reading **comic books** in public libraries.   He doesn't read **them** at home.

(b) Distractor: e.g. *find*

(i) Non-anaphoric contexts: An overt object in English

(5.4) *The charity's aim is to help local unemployed youngsters find ___.

(ii) Anaphoric contexts: An overt object in English

(5.5) David said those students were in the canteen, but I told him I didn't find *(them) here.

5.6 Token count

In total, there were 55 tokens for all target verbs in this study (see table 5.1). There

were 15 tokens of target verbs in an oral task, 15 tokens of target verbs and 15

distractors in a written task. In addition, 25 tokens of target verbs and 25 distractors

were used in an acceptability judgment and interpretation test (AJIT). It should be

noted that anaphoric object drop was not targeted in the oral and written tasks because

those two tasks commonly aimed to examine object drop in non-anaphoric contexts.

Oppositely, the AJIT primarily aimed to elicit anaphoric object drop, so null arbitrary

cognate objects were not examined (see section 5.7 for details).

Table 5.1 Token counts in three research tasks

	Task 1 Oral task	Task 2 Written task	Task 3 AJIT	Total number of tokens
Contexts	Non-anaphoric	Non-anaphoric	Anaphoric	
Target Verbs:				
draw/drink/drive /read/iron	15 tokens	15 tokens	25 tokens: (12 specific object and 13 non-specific object)	Total: 55 tokens
Distractors:				
buy/find/promote /repair/use	Nil	15 tokens	25 tokens	Total: 40 tokens

5.7 Experimental tasks

5.7.1 Oral task (with verbal prompts)

5.7.1.1 Task aim

This 15 test-item task aimed to investigate to what extent Chinese can use a null

arbitrary cognate object or supply an overt object in non-anaphoric contexts in their

oral task (see appendix A). The target verbs can take a null arbitrary cognate object in

non-anaphoric contexts in L2 English whereas they require an overt object in Chinese.

5.7.1.2 Task design: Prompt words and the rule of minimizing the number of words

Target verbs – *draw(pictures), drink(alcohol), drive(cars), read(books), iron(clothes)*

Participants were given prompt words including:

(i)   a noun phrase as a subject (e.g. *David and his brother*) and

(ii)   a target verb (e.g. *read*) and

(iii)   a time phrase (e.g. *every night*) or time adverb (e.g. *always*) in each sentence.

David and his brother /	**every night /**	**read (verb)**

Participants were instructed to use all given prompt words. They were asked to make up one sentence in the shortest length, and immediately read it aloud to a digital recorder. Their oral production were recorded and later transcribed into English. Participants were clearly informed that they aimed to minimize the number of words they uttered in each test item, with a condition that they had to use all given words. This rule was to urge participants NOT to use any optional words so as to examine whether participants can acquire a null arbitrary cognate object in English. This rule of minimizing the number of words in this setting was fully tested by the Chinese and native English speakers in pilot tests using this rule, which had successfully achieved this aim. In the pilot tests, all native English speakers showed that they changed not to supply any optional words in the oral task when they followed the rule of minimizing the number of words. In the pre-test practices in the main study, some Chinese also showed that they changed their potential utterance and did not produce an overt object when they were reminded of the rule. As Mackey and Gass (2008: 50) point out that "If learners do not use a form at all, we cannot assume that they cannot use the form unless they consistently do not use it in a required context". This oral task was judged to be a reliable way to tap participants' linguistic competence on producing a null

object. For instance, prompt words like *David and his brother*, *read*, *every night* were given, participants were not expected to supply other optional words like *books* and *at home* as in *David and his brother read books at home every night* if they realized *books* and *at home* were optional. Therefore, they were expected to utter *David and his brother read every night* and this revealed that a null object has been used.

In the main study, two pre-test practice sentences (or warm-up exercises) in this oral task and the following written task were attempted by all participants. Taking warm-up exercises aimed to help participants to feel ease with implementing the remaining test items of the experimental tasks. No feedback on participants' response was made because any particular feedback would influence participants' bebaviour in the experimental tasks. The only task for the researcher, right after the warm-up exercises, was to repeat the task instructions orally to participants. This aimed to further strengthen participants' awareness of the task instructions. After the warm-up exercises, participants were tested to judge whether an overt object or a null object was required. The possibility of warm-up exercises influencing the participants' linguistic behaviour and skewing the results was therefore minimized as far as possible.

5.7.1.3 Task design: Enhancing challenges on test sentence authenticity

In each test sentence, participants were given a noun phrase as a subject (singular and plural person), a time phrase or time adverb, and a target verb. Another highlight of this task design was the intended use of 'singular or plural in person' for a subject, as this requires Chinese (non-native English speakers) to comply with subject-verb agreement in English while they are primarily tested in the use of a null object in those test sentences.

Examples: *read* (verb)

1. my father / every Sunday night /read (verb)

2. David and his brother /every night / read (verb)

3. the retired engineer / read (verb) / seldom

Chinese participants were required to use all given words and to make proper changes on subject-verb agreement in English (e.g. *My father reads every Sunday night*; *David and his brother read every night*). However, this task only focused on whether participants can use a null object. The issue on whether participants can comply with the subject-verb agreement rule is not taken into account in this study. In this oral task, the rationale for not including other verbs that required the use of overt objects was to shorten the time needed to complete the entire experiment which consisted of three tasks, with a 30-minute English proficiency measurement test ahead.

5.7.2 Written task

5.7.2.1 Task aim

Further to an oral task, this written task also aimed to find out to what extent Chinese can acquire a null arbitrary cognate object in English or supply an overt object in non-anaphoric contexts (see appendix B). English allows a null arbitrary cognate object in non-anaphoric contexts. Participants were tested to reveal that they used a null arbitrary cognate object in English or they had to produce an overt object in a test sentence. This task consisted of 15 test items and 15 distractors. All test items were adapted from the occurrences with both target verbs and distractors from the British National Corpus (BNC).[17]

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[17] The British National Corpus (BNC) (1980s – 1993) is a 100 million word collection of samples of written and spoken language from a wide range of sources. http://corpus.byu.edu/bnc/.

5.7.2.2 Task design: Modifications on test items adapted from BNC

To use authentic sample sentences as test items, I searched the British National Corpus for 30 occurrences with the target verbs and distractors that can allow a null arbitrary cognate object or not (i.e. 15 target verbs and 15 distractors). This was to enhance test sentence authenticity in allowing a null arbitrary cognate object or not in English. After those 30 occurrences with target verbs and distractors were found, I then modified each occurrence for participants' comprehensibility of test items in this present study. Modifications on each occurrence from BNC were made with reference to (a) length of test items and (b) lexical items.

(a) Length of test items – Each test item ranged from 11 to 17 words and it was one to two sentences long. This aimed to reduce variance on sentence length of all test items so that task effect including processing can be reduced.

(b) Lexical items – To reduce the chance of lexical items, rather than syntax, that influenced participants, I replaced lexical items that were possibly difficult to participants by simpler words. The judgment was firstly based on my English teaching experience to Chinese students. In addition, two Chinese at a high-beginner English level (that is the lowest English level for target participants in this study) were recruited to check up on difficulty of all lexical items in a pilot test. No further modification on lexical items was needed.

Summarizing, all 30 occurrences with five target verbs and five distractors were adapted from BNC. Then, they were modified with respect to sentence length of test items and comprehensibility of lexical items. All modified test items in this task were attempted by two Chinese participants with a high-beginner English level and they indicated that all test items were comprehensible to them. The following are illustrations on how modifications were made:

Target verb: e.g. *iron*

An occurrence from BNC – (to iron: entry 36)[18]

(5.6) A few people have tried to set up as independent ironers but we seem to be

reluctant to pay someone £4 an hour to **iron**.   (25 words)

Modifications from (5.6) to (5.7) on (a) sentence length and (b) lexical items

(5.7) We are unwilling to pay someone HK$ 60 an hour to **iron**.   (12 words[19])

(a) Shortened the test item length from 25 words to 12 words (within 11-17 words)

(b) Replaced *reluctant* by *unwillingly*

Distractor: e.g. *use*

Original occurrence from BNC – (use dictionaries: entry 2)

(5.8) Using dictionaries doesn't itself teach people how to spell; but someone whose

spelling is uncertain finds it hard to **use** dictionaries.   (21 words)

Modification from (5.8) to (5.9) on (a) sentence length of each test item

(5.9) Someone who has difficulty with spelling will find it hard to **use dictionaries.**

(13 words)

(a) Shortened the test item length from 21 words to 13 words (within 11-17 words)

Regarding distractors, given a distractor test item like *Someone who has difficulty with spelling will find it hard to use _____,* participants were expected to supply an overt object above the line like *dictionaries* or *computers* or others because those distractors generally do not take a null arbitrary cognate object.

The following is a list of all modified 15 test items (with five target verbs and five distractors) adapted from occurrences found from BNC:

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[18] (to iron: entry 36) means that the occurrence can be found when we searched 'to iron' from BNC, and that was the 36th entry.

[19] 'HK$' is counted as one word; two separate words are counted when there is a word space in between.

Read:

1. Some of us have been up since 6:30am and we like to read __*e*__. (read: entry 476)

2. I'm sure you read__*e*__every night before going to sleep. (read: entry 3297)

3. Some students in this primary school read__*e*__inefficiently and ineffectively. (read: entry 2143)

Iron:

1. We are unwilling to pay someone HK$ 60 an hour to iron__*e*__. (to iron: entry 36)

2. Generally speaking, lazy people only iron__*e*__ when they are forced to. (iron: entry 931)

3. A friend pointed out how boring it would be to iron__*e*__all evening. (iron: entry 2289)

Drink:

1. Grandma told us that she didn't like people to drink__*e*__ all day. (drink: entry 1014)

2. Tom and David do not take drugs.   They do not drink__*e*__. (drink: entry 130)

3. Some of my friends sat down on the sand and began to drink__*e*__. (to drink: entry 101)

Drive:

1. Most retired people like a quiet life and don't drive__*e*__. (drive: entry 16)

2. I'll drive__*e*__because I have a licence and I'm really quite good. (will drive: entry 1)

3. Denise and Tony say that they are learning to drive__*e*__. (drive: entry 185)

Draw:

1. David said to his friends, "When I am not writing, I draw__*e*__." (draw: entry 61)

2. It doesn't cost much to go for a walk or to learn to draw__*e*__. (draw: entry 81)

3. Bill will never learn to draw__*e*__ if we do not teach him how to do it. (to draw: entry 51)

5.7.2.3 Task design: A pronounced object only for an incorrect test sentence

Written task

The following are task instructions in this written task:

- If you find that a sentence is INCORRECT, fill in the blank with appropriate

  words (maximum of 3 words).

- If you found that a sentence was CORRECT, <u>do NOT put any words in the blank</u>, just put a '√'.

When participants found that a test item was correct, they were instructed to put a '√' above the line as in *The millionaire never cooks* <u>√</u> *for his family.* Otherwise, they were expected to complete that sentence with any words they liked (maximum of three words). All participants were cross-checked for understanding the task instruction after they completed two pre-test items in this task. For instance, participants supplied no object after *cook* as in *The millionaire never cooks for his family* and this has revealed that a null object was supplied. Otherwise participants could supply an overt object such as *meal* or *dinner* if they found that test sentence was incorrect. As for distractors that cannot take a null arbitrary cognate object in English, participants were expected to supply an overt object because distractors generally do not take a null arbitrary cognate object in English. For example, in *Someone who has difficulty with spelling will find it hard to use* _____, participants were expected to supply an overt object like *dictionaries* or *computers* or others after the verb *use*. The distractors and target verbs were randomly mixed, in line with common practice in SLA studies was to enhance the reliability of the results of using a null object in this task.

5.7.3 Acceptability judgment and interpretation test (AJIT)

5.7.3.1 Task aim

This task aimed at investigating, when compared to the native English speaker controls, to what extent Chinese would interpret a null arbitrary cognate object (internally-licensed) as anaphoric object drop (discourse-linked), given a possible discourse antecedent in English. In that case, Chinese accept the possibility of anaphoric object drop in English whereas native English speakers generally do not allow (see appendix C). For instance, given two sentences *Susan irons Paul's shirts before he goes to work. Paul doesn't iron at weekends*, the aim of this task was to find

out to what extent Chinese would interpret the second sentence as *Paul doesn't iron his shirts at weekends*, rather than *Paul doesn't iron anything at weekends*. Altogether, this task consisted of 25 test items and 25 distractors.

5.7.3.2 Task design: Tapping participants' sentence interpretation

In this AJIT, the test sentence structure design was primarily based on Yuan (1997). Yuan (1997) was the first systematic study of the null object phenomenon in L2 English by Chinese. He found out that Chinese were unable to detect ungrammaticality of the null object. His study included test sentence structures like *Mary's bike has been broken. I am going to repair *(it) for her* whereas discourse-linked object drop was ungrammatical in English. In this present study, English however allows an internally-licensed null arbitrary cognate object *e* as in *Susan irons Paul's shirts before he goes to work. Paul doesn't iron [e] at weekend.* The above test sentence with a null arbitrary cognate object is, however, grammatical in English. In this AJIT, participants were primarily tested on whether they allow anaphoric object drop, particularly with target verbs that can allow a null object. An interpretation of that object gap in the second sentence is very crucial to understanding a sentence meaning even though they have shown that they can accept a null object form as correct. This experimental task was designed to elicit the answer (A1 on p.72) showing that participants accepted anaphoric object drop with respect to verbs that allow a null cognate object. Other correct answers, in non-anaphoric contexts, such as "Paul doesn't iron at weekend" were not examined in this study because it was beyond the scope of this study. Admittedly, those correct answers are worth investigating, but in future study.

Consider (5.10),

(5.10)

Susan irons Paul's shirts before he goes to work. Paul doesn't iron at weekends.

(5.10a) Susan irons Paul's shirts before he goes to work.

(5.10b) Paul doesn't iron at weekends.

Each test item consisted of two sentences (e.g. (5.10a) and (5.10b)). In the first sentence, a possible discourse antecedent was given (e.g. *Paul's shirts*); the target verb (e.g. *iron*) in the second sentence can either allow an overt object like a pronoun or a DP (e.g. *it* or *his shirts*) as in anaphoric contexts or allow a null arbitrary cognate object as in non-anaphoric contexts. Each test item was under scope of negation for all target verbs and there were 25 test items and 25 distractors in this task. There was no warm-up exercise in this AJIT because this aimed to shorten the length of the entire experiment, and because in the pilot, it was clear that participants understood how to complete the task without warm-up exercises. The first two experimental tasks lasted about 10-30 minutes and this AJIT consisting of 50 questions was approximately 45-60 minute long.

To tap participants' linguistic competence on interpreting a null object, I therefore had this AJIT designed with the main aim to find out whether participants allowed anaphoric object drop (see instructions below).

Instructions
- If the sentence is CORRECT, (i) tick the Correct box and (ii) circle the BEST answer (a) OR (b).
- If the sentence is INCORRECT, (i) tick the Incorrect box, (ii) write any changes on the line, and (iii) circle the best answer (a) OR (b).

Susan irons Paul's shirts before he goes to work. Paul doesn't iron at weekends.
□   Correct
Circle (a) or (b):
Paul doesn't iron   a. his shirts   b. anything   at weekends.

□   Incorrect (write any changes):   _____
Circle (a) or (b):
Paul doesn't iron   a. his shirts   b. anything   at weekends.

An answer to each test item in this task can be in one of the four possible answers below (A1 – A4). In this task, what I was most concerned with was the only 'wrong' answer revealing that participants accepted the null object form as correct but interpreted it as an antecedent (i.e. A1: Correct and (a)). That is to say, the choice of A1 revealed that participants accepted or allowed anaphoric object drop in English. Other correct answers (A2 - A4) revealed that participants rejected or disallowed anaphoric object drop (i.e. the impossibility of anaphoric object drop) and they were correct in grammar and in sentence interpretation and they would be taken as motivated by other considerations as shown below.

Four possible answers (A1 – A4):

'An interpretation problem' (as in anaphoric contexts)

[#](A1)Susan irons Paul's shirts before he goes to work. Paul doesn't iron *e* at weekends.

[#]A1 revealed that participants interpreted a null arbitrary cognate object as anaphoric object drop in anaphoric contexts whereas English generally does not allow it, so that is what I called *an interpretation problem*.

Grammatical and correct interpretation (as in anaphoric contexts)

(A2) Susan irons Paul's shirts before he goes to work. Paul doesn't iron **them /Paul's shirts** at weekends.

Grammatical and correct interpretation (as in non-anaphoric contexts)

(A3) Susan irons Paul's shirts before he goes to work. Paul doesn't iron *e* at weekends.

(A4) Susan irons Paul's shirts before he goes to work. Paul doesn't iron **anything** at weekends.

5.7.3.3 Test items with anaphoric objects (specific and non-specific)

Previous SLA studies revealed that Chinese have difficulty in unlearning anaphoric object drop in L2 English, but these studies all focused on anaphoric specific object drop (with a definite antecedent). Hence, this AJIT, innovatively, also set out to examine to what extent Chinese would allow anaphoric non-specific object drop, compared with anaphoric specific object drop. Those pronounced objects in anaphoric contexts in L2 are 12 anaphoric specific objects (with a definite antecedent) and 13 anaphoric non-specific objects (generally with an indefinite antecedent). In anaphoric contexts, each target verb takes an anaphoric object (specific or non-specific) that can be a pronoun or a DP. Examples with anaphoric specific object and non-specific objects from the main study are listed as follows (see appendix D):

With an anaphoric specific object (a pronoun or a DP)

1. Susan irons Paul's shirts before he goes to work. Paul doesn't iron **them** at weekends.

2. Daniel asked Esther, "Why don't you sell your Toyota? You won't drive **it** after retirement".

With an anaphoric non-specific object (a pronoun or a DP)[20]

1. Tom asked Kitty, "Would you read science books in your leisure time?" Kitty answered, "I don't read **them** in my leisure time".

2. Mary asked Peter, "Would you like whisky now?" Peter answered, "I don't drink **whisky** at lunch".

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[20] As stated in section 5.7.3.2, the AJIT was designed to elicit the answer (A1 on p.72) showing that participants accepted anaphoric object drop. In non-anaphoric contexts, it is acceptable to answer those questions by saying "I don't read in my leisure time" and "I don't drink at lunch". However, those correct answers in non-anaphoric contexts were not examined here because it is beyond the scope of this study.

Distractors

It was important to make sure that there were sufficient numbers of distractor sentences so that participants in this study did easily guess what the investigated aspect of grammar was. Therefore, 25 distractors and 25 target verbs were used randomly in this AJIT.[21] Unlike target verbs, distractors were used because they generally do not take a null arbitrary cognate object in non-anaphoric contexts in English, and an overt object therefore was required. Consider (5.11), one example distractor from the main study, Chinese were expected to tick the box 'Incorrect', and then to supply an overt object after the verb if they realized that object drop (specific and non-specific) in anaphoric contexts in English was not allowed; they were also expected to circle the following option 'a. my blue shirt'.

(5.11)

I am looking for my blue shirt.   I can't find in my wardrobe.

□   Correct

Circle (a) or (b):

I can't find   a. my blue shirt   b. anything   in my wardrobe.

√   Incorrect (write any changes): ***I can't find it in my wardrobe***

Circle (a) or (b):

I can't find   (a. my blue shirt)   b. anything   in my wardrobe.

Four possible answers (B1 – B4):

Ungrammatical in anaphoric contexts

(B1) *I am looking for my blue shirt. I can't find *e* in my wardrobe.

Grammatical with correct interpretation (as in anaphoric contexts)

(B2) I am looking for my blue shirt. I can't find **it / blue shirt** in my wardrobe.

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[21] As explained on p.60, distractors such as *find* were verbs that cannot take a null arbitrary cognate object in English in non-anaphoric contexts whereas target verbs such as *read* can. Distractors were not examined in this thesis due to the limited scope of study, but they are worth investigating in future study.

Ungrammatical in non-anaphoric contexts

(B3) *I am looking for my blue shirt. I can't find *e* in my wardrobe.

Grammatical with correct interpretation (as in non-anaphoric contexts)

(B4) I am looking for my blue shirt. I can't find **anything** in my wardrobe.

In summary, this AJIT task aimed at finding out, when compared to native English speaker controls, to what extent Chinese would interpret a null arbitrary cognate object as anaphoric object drop, particularly with target verbs that can allow a null arbitrary cognate object. In addition, this AJIT also examined the possibility of anaphoric object drop, focusing on specific and non-specific object drop.

5.7.4 Innovativeness of my study

Based on conventional data elicitation methods such as an oral task, a written task and an acceptability judgment test, I further devised the three tasks with innovativeness in my study. Specifically, as for the oral task, prompt words without picture effect and the specific rule of minimizing the number of words were used to elicit the production of null objects by Chinese learners of English. As for the written task, authentic sample sentences extracted from British National Corpus were modified with respect to sentence length and lexical items, aiming to enhance test sentence authenticity in allowing null objects in English. Unlike a traditional acceptability judgment test, an acceptability judgment and interpretation test (AJIT) was used to tap participants' interpretation of a null object. This AJIT task was therefore designed with four options (Answers 1-4), indicating participants' acceptance or rejection of a null object and also their interpretation of it (see section 5.7.3.2). To enhance the data reliability of this four-option task, I particularly made the tokens of target verb per participant in this

task as high as 25, with another 25 distractors. To sum up, with innovativeness, this study can tap participants' linguistic competence related to the investigated aspect of grammar in each task of this study.

5.8 Criteria for evidence in linguistics and data coding

5.8.1 Criteria for an existence of a certain language phenomenon

When evaluating an existence of a certain language phenomenon in this empirical study, it is important to have reliable criteria for the existence, i.e. what counts as evidence in linguistics. Penke and Rosenbach (2007) discuss what counts as evidence in linguistics. They (ibid: 7) point out that two types of evidence are distinguished according to the way of how evidence is used, i.e. qualitative evidence and quantitative evidence. These terms are not defined in the commonly understood way in terms of type of data or methodology, but in a more nuanced way about the use of the data as evidence itself. They explain their distinctive ways of using qualitative and quantitative evidence as follows:

> *Using data qualitatively simply means that we use data to show that a certain form/construction is possible in a specific context or that a certain experimental effect occurs in an experimental setting.*
>
> (Penke and Rosenbach 2007:7)

> *To work quantitatively means that we do not use data solely to show that a form/construction or effect exists but rather how much of it exists, i.e. we quantify the data.*
>
> (Penke and Rosenbach 2007:9)

They (ibid: 7) explain that "The terms are certainly not meant to be evaluative with 'qualitative' evidence constituting any better type of evidence than 'quantitative' evidence". They state that when investigating whether children have successfully

mastered English past tense inflection, the presence of a particular percent of target forms in the data set is taken to confirm that the categorical past tense rule has been acquired. Gass et. al. (2013: 73) state that researchers use a variety of criteria to determine when acquisition of a form has taken place. They (ibid) state that "various definitions of acquisition of a form are possible: (a) the first appearance of a correct form, (b) a certain percentage of accurate forms, (c) the "first of three consecutive two-week samples in which the morpheme is supplied in over 90% of obligatory contexts" (Hakuta, 1976a, p.137)". The above may suggest that there is no fixed criterion for an acquisition of a form in linguistics.

Based on the above, it seems appealing to use the complementary use of both qualitative and quantitative evidence as defined by Penke and Rosenbach's approach, so I subscribe to Penke and Rosenbach's (2007) view in this thesis. The criteria for an existence of a language phenomenon in the analysis and discussion in this study are (a) the first appearance of a particular form[22] in an obligatory context in which that particular form is required (qualitative evidence), and supplemented with (b) a certain percentage of a particular form (quantitative evidence) (see section 5.8.2 on percentage accuracy in the previous SLA studies). Specifically, I subscribe to Brown's (1973) and Hakuta's (1976a) criterion for acquisition: 90% is the required percentage as evidence of acquisition in this study. The required percentage used (quantitative approach) is supplementary to the first appearance of a particular form (qualitative approach) in this study. According to Penke and Rosenbach (2007: 9), quantitative and qualitative approaches can be used together in formal approaches to linguistics.

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[22] Larsen-Freeman and Long (1993: 283) point out that Meisel, Clahsen and Pienemann (1981) define acquisition as the first appearance of a form in an interlanguage.

5.8.2 Data coding

Both the oral and written tasks in this study aimed to investigate to what extent participants can use a null arbitrary cognate object. Hence, the absence of a pronounced object (i.e. an occurrence of a null object) is clear and valid to be counted as a token of a null object. For instance, a null object was counted in *David and his brother read every night*. By contrast, when there was a pronounced object as in *David and his brother read books/magazines every night*, it is clearly that no token of a null object was counted. When counting tokens of null objects in the oral task, I counted the final utterances but also reported self-corrections in table 6.6 (see Zyzik (2008) on self-corrections).[23] In my results, the term 'percentage accuracy' was used, calculated by taking the number of tokens of null objects divided by the total number of tokens in the oral/written task and multiplying by 100 (e.g. 10 tokens of a null object out of 15 tokens in the oral task = 66.67% accuracy). Other issues related to pronunciation in the oral task, spelling or grammatical mistakes in the written task would not be examined in this study because the aim of those two tasks was to investigate the production of a null object. There were 15 tokens of target verbs in each of the oral and written tasks (see table 5.1). As for the AJIT, the aim was to investigate the possibility of anaphoric object drop, and only answers of A1 with an interpretation problem (see section 5.7.3.2) in each test item were counted as allowing or accepting anaphoric object drop. It was because the answer A1 revealed that participants accepted the test item with a null object form as correct, but interpreted that null object as anaphoric object drop (which is assumed to be based on L1 transfer), whereas native English speakers generally do not allow anaphoric object drop. All other three answers A2 - A3 revealed that

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[23] Zyzik (2008: 91) reports that an interesting feature of the oral data was the presence of self-corrections: self-corrections began with a null object, which was later remedied by means of an overt object. Zyzik (ibid: 99) further suggests that "the self-corrections were interpreted as examples of repair as attempts to fill the missing object slot, which suggests that learners, when monitoring their speech, rejected their initial production of null objects".

participants disallowed or rejected anaphoric object drop. There were five tokens for each of five target verbs and the total number of tokens was 25 in this AJIT. Similarly, in my results, the percentage of allowing anaphoric object drop was calculated by taking the number of tokens of anaphoric object drop divided by the total number of tokens and multiplying by 100.

5.9 Participants

5.9.1 Selecting criteria

This study tested 85 adult Chinese learners of English in Hong Kong, with 22 native English speaker controls in the United Kingdom. Having considered standard SLA constraints such as language use in family and social life, experiences of living in an English speaking country and so on, I targeted Chinese participants who fulfilled all the following five criteria. This aimed to reduce differences in context of learning and to control for homogeneity of participants. By doing this, individual differences can be reduced and this avoided potential impact from individual differences on the validity of findings in this present study. Those five criteria are:

a)   they are Chinese and were born in Hong Kong

b)   they are adult instructed English learners

c)   they have not stayed in an English speaking country for more than two months

d)   they use Cantonese as the first language

e)   they use Cantonese to speak with family members and friends

First, all Chinese participants were born in Hong Kong and they are adult instructed English learners. They had less than two months experience in living in an English speaking country; this criterion is to screen out those Chinese who returned to Hong Kong but actually had input of English in an English speaking country for two months or more. Another criterion is that Chinese participants use Cantonese to speak

with family members and friends. In addition, Cantonese is their first language, as reported in participants' personal bio-data sheets. Those criteria are to screen out another cluster of adult Chinese in Hong Kong who mainly use English to speak with family members and friends.

Lastly, to reduce the gender and age effect on the results of my findings of this study, I had all Chinese participants as adult instructed English learners, with an approximately equal number in gender (44 male and 41 female). As for the controls group, there were 12 male and 10 female adults in the United Kingdom and all are native English speakers. To sum up, the above five selecting criteria for Chinese participants can reduce individual differences so as to control for homogeneity of participants. Ultimately, this helps enhance the validity of findings and discussions for this present study.

5.9.2 Sample size, English levels and Oxford Quick Placement Test

In line with Yuan (1997), I tested Chinese participants' English proficiency levels to investigate if there were any group differences, proficiency levels among the Chinese participants, might affect results in all research tasks in this study. I adopted an Oxford Quick Placement Test (OPCT) for evaluating participants' English levels. OPCT is a standardized English proficiency test (Allan (2001)) and it is well-accepted in previous SLA studies (e.g. Jiang 2009; Snape 2009). The test consisted of 60 multiple-choice questions and the time allowed to complete the test is 30 minutes. After the test, Chinese participants were then categorized into three sub-groups at different English levels with reference to their test scores (see table 5.2). Three Chinese sub-groups with different English levels are: (i) high-beginner, (ii) low-intermediate, and (iii) advanced. The sample size of Chinese participant in this study was 85 (41 male and 44 female) and they were initially divided into 15 high-beginner, 34 low-intermediate and 36 advanced (see table 5.3). However, I should point out that the three Chinese

sub-groups were finally aggregated to one group for data analysis. It was because the statistical results in findings reveal that there were no statistical differences in learning null arbitrary cognate objects in the oral/written task among sub-groups. Secondly, there was no statistically important relationship between English proficiency levels of each sub-group and the percentage accuracy of using null arbitrary cognate objects in the oral/written task. All the above will be explained in detail in sections 6.2.2 and 6.3.2.

Table 5.2 Test scores and English levels - Oxford Quick Placement Test (Allan 2001)

Oxford Quick Placement Test Scores	Description
0 – 17	
18 – 29	High-beginner
30 – 39	Low-intermediate
40 – 47	High-intermediate
48 – 54	Advanced
55 – 60	Proficient

Table 5.3 Participants: Sample size, gender and English levels

Participants	Gender	Number of participants	Breakdown into three sub-groups at different English levels (Oxford Quick Placement Test)		
			High-beginner	Low-intermediate	Advanced
85 Chinese	M	41	8	16	17
	F	44	7	18	19
22 Native English speaker controls	M	12			
	F	10			

5.10 Ethical and confidentiality issues: Personal bio-data sheet / Consent form

Participants in this study were asked to fill in a Personal bio-data sheet (see appendices E and F). The Personal bio-data sheet was to elicit participant background such as their first language, language use in family and social life, the experience of living in an English speaking country to check for homogeneity as explained above. Prior to data collection, participants were provided with a project information form which fully explained this study. A written consent form was signed by participants (see appendix G). They all agreed to take part in this study on a voluntary basis. They also understood they could withdraw from this study at any time and for any reason. To comply with all ethical considerations laid out by Newcastle University and wider standard practice, for implementing this research study, I take full responsibility to ensure all data collected are kept confidential and the identity of each participant is anonymised.

5.11 Summary

This chapter covers the main issues related to research questions and methodology such as data collection procedure, choices of target verbs and distractors, participant selection and ethical issues. Summarizing, the following table 5.4 shows a clear picture of how three research questions, three experimental tasks and two hypotheses are related.

Table 5.4 Research questions, experimental tasks and hypotheses

Research Questions		Experimental Tasks	Hypotheses
1	To what extent can Chinese learners of English learn null arbitrary cognate objects?	Task 1: oral and Task 2: written	Hypothesis 1a: Chinese can acquire the Null ACO rule which is not instantiated in L1. (RQ 1) Hypothesis 1b: Chinese cannot acquire the Null ACO rule.
2	To what extent can Chinese learners of English unlearn anaphoric object drop? Do they interpret a null arbitrary cognate object as discourse-linked anaphoric object drop?	Task 3: AJIT	Hypothesis 2a: there is no ambiguity of null arguments. (RQ 3; data from RQs 1 and 2)
3	Is there a correlation between learning non-anaphoric object drop and unlearning anaphoric object drop?	Correlation between Task 1/ 2 and Task 3	Hypothesis 2b: some degree of ambiguity of null arguments can be tolerated.

Chapter 6. Findings

In this chapter, I present data collected from the oral task, written task, and acceptability judgment and interpretation test (AJIT) to address my three research questions mentioned in section 5.1. Results are presented in percentage accuracy terms for the use of null arbitrary cognate objects. There was no missing data in all research tasks and all raw data were converted into percentages according to scoring methods explained in section 5.8. Prior to presenting data in this chapter, I start with explaining what statistical tests I used in this study with justifications in (6.1). The following sections then present data collected from the (6.2) oral task, (6.3) written task, (6.4) correlation between oral and written tasks, (6.5) AJIT, (6.6) correlation between AJIT and oral task, (6.7) correlation between AJIT and written task, and (6.8) summary of main findings.

6.1 Choosing statistical tests: Non-parametric Mann-Whitney Test and Spearman's rho correlation (non-normal distribution)

In this study, there were 85 adult Chinese learners of English and 22 native English speaker controls (henceforth the controls). All data were entered and analysed using SPSS. To start, data were analysed for distribution to ensure the appropriate tests would be used. From Mann-Whitney test, it was found that data on using null arbitrary cognate objects from Chinese in both oral and written tasks were not normally distributed, as illustrated in tables 6.1 and 6.2 (i.e. data were toward the right hand side in figures 6.1 and 6.2). In addition, the numeral measurements of skewness for using null arbitrary cognate objects in the oral and written tasks by Chinese were -1.292 and -1.011 which were negatively skewed (i.e. data are toward the upper end of the scale). Skewness refers to the shape of a distribution curve, and skewness level over 1 indicates a significant departure from normality (Larson-Hall 2010: 79). In this case, the non-normal distribution indicates highly successful acquisition of the target form, as I go on to discuss in more detail below.

Due to the non-normal distribution, all statistical analysis for this study was carried out using non-parametric tests: Mann-Whitney Test (its parametric counterpart is t-test for 2 independent samples) and Spearman's rho correlation (non-parametric statistics for correlation). I adopted Cohen's (1992) interpretation for effect sizes (R^2): $R^2 = 0.01$ is a small effect, $R^2 = 0.09$ is a medium effect and $R^2 = 0.25$ is a large effect. An effect size measures how much effect can be attributed to the influence of an independent variable on a dependent variable, or to the relationship between variables (Larson-Hall 2010: 392).

Table 6.1 Percentage accuracy of using null arbitrary cognate objects by Chinese (oral task)

Percentage accuracy of using null arbitrary cognate objects in the oral task	Number of Chinese (total: 85)
100.000%	43
93.333%	5
86.667%	6
80.000%	5
73.333%	4
66.667%	5
60.000%	3
53.333%	3
40.000%	2
33.333%	3
26.667%	2
20.000%	4
0.000%	0

Figure 6.1 Histogram: Using null arbitrary cognate objects by Chinese (oral task)
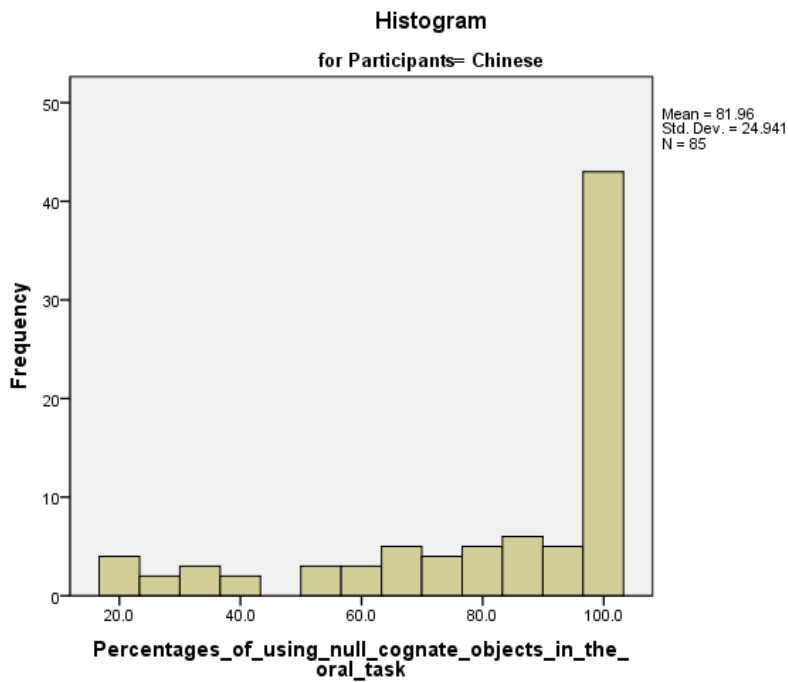
Table 6.2 Percentage accuracy of using null arbitrary cognate objects by Chinese

(written task)

Percentage accuracy of using null arbitrary cognate objects in the written task	Number of Chinese (total: 85)
100.000%	18
93.333%	13
86.667%	10
80.000%	11
73.333%	12
66.667%	4
60.000%	9
53.333%	2
46.667%	3
40.000%	1
33.333%	1
26.667%	0
20.000%	0
13.333%	1
0.000%	0

Figure 6.2 Histogram: Using null arbitrary cognate objects by Chinese (written task)
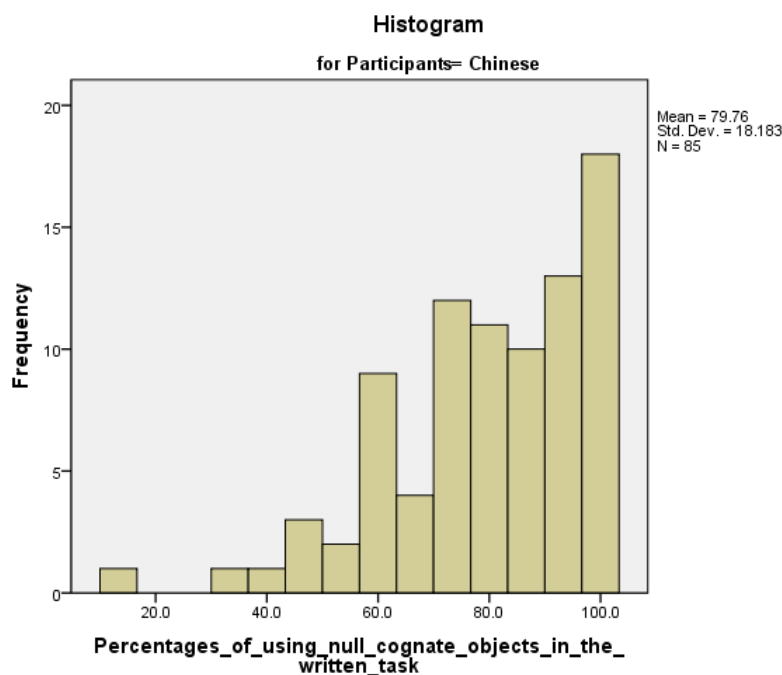
6.2 Oral task: Using null arbitrary cognate objects in English

6.2.1 Oral task: Descriptive statistics

The first research question was to examine to what extent Chinese can or cannot use null arbitrary cognate objects in non-anaphoric contexts in English. This oral task (and the written task in section 6.3) aimed to test acquisition of the hypothesised Null ACO rule (see section 3.4.4.1). To avoid unnecessary repetition, I list the same hypothesis, potential experimental outcomes and variables for both the oral and written tasks as follows.

The oral/written task: Hypotheses

Hypothesis 1a: Chinese can acquire the Null ACO rule which is not instantiated in L1.

Potential experimental outcome:

This predicts that Chinese learners of English (e.g. advanced level) can produce a null arbitrary cognate object for a target verb in the experimental settings of the oral/written task.

The alternative hypothesis 1b: Chinese cannot acquire the Null ACO rule.

Potential experimental outcome:

This predicts that Chinese learners of English cannot produce any null arbitrary cognate object for a target verb in the experimental settings of the oral/written task.

The dependent and independent variables are as follows.

Dependent variable:

Measure of the possibility of null arbitrary cognate objects in the experimental settings

Independent variable:

L2 English level (High-beginner, Low-intermediate, and Advanced) (see section 5.9.2 Oxford Quick Placement Test)

An important point to note that the entire group of 85 adult Chinese was initially categorized into three sub-groups (15 high-beginner, 34 low-intermediate, and 36 advanced) according to their English proficiency levels. This originally predicted that Chinese learners of English with higher English levels would produce a higher percentage of null arbitrary cognate objects. This also predicted that there would be statistically significant differences in the use of null arbitrary cognate objects between sub-groups at different English levels. However, those predictions were not borne out and this will be seen in section 6.2.2. All three sub-groups were therefore aggregated into one group and the experimental task results of the entire group were used for testing the hypotheses as shown above.

The following are descriptive statistics for using null arbitrary cognate objects in non-anaphoric contexts in the oral task by both Chinese and the controls. The data are presented first as aggregated Chinese vs. control groups for ease of comparison, and then group effects (in fact lack of them) are presented.

Table 6.3 Descriptive statistics for using null arbitrary cognate objects in the oral

task

Using null arbitrary cognate objects in the oral task	Mean (% accuracy)	Std. Deviation (SD)	Min. (% accuracy)	Max. (% accuracy)
The entire Chinese group (N =85)	81.961	24.941	20.000	100.000
Controls (N = 22)	100.000	0.000	100.000	100.000

Table 6.4 Cumulative percentages of Chinese: Using null arbitrary cognate objects

in the oral task

% accuracy: Using null arbitrary cognate objects in the oral task	Cumulative no. of Chinese (total: 85)	Cumulative percentages of Chinese
100% (15 tokens)	43	50.59%
80.00% − 100% (12 - 15 tokens)	59	69.41%
73.33 – 100% (11 – 15 tokens)	63	74.12%
60.00 – 100% (9 - 15 tokens)	71	83.53%
53.33 – 100% (8 - 15 tokens)	74	87.06%
40.00% − 100% (6 -15 tokens)	76	89.41%
33.33% − 100% (5 - 15 tokens)	79	92.94%
20.00% −100% (3 - 15 tokens)	85	100.00%
0.00% − 100% (0 - 15 tokens)	85	100.00%

Table 6.5 Descriptive statistics for using null arbitrary cognate objects in the oral task (sub-groups)

Using null arbitrary cognate objects in the oral task	Mean (% accuracy)	Std. Deviation (SD)	Min. (% accuracy)	Max. (% accuracy)
At high-beginner English level (N = 15)	68.889	34.426	20.000	100.000
At low-intermediate English level (N = 34)	79.412	26.736	20.000	100.000
At advanced English level (N = 36)	89.815	14.208	53.333	100.000
Controls (N = 22)	100.000	0.000	100.000	100.000

Table 6.3 indicates that the controls all obtained 100% accuracy in the use of null arbitrary cognate objects in non-anaphoric contexts in the oral task. That is, the controls did not supply an overt object in any test items. As for Chinese, the entire group (N =85) obtained a mean percentage accuracy of 81.96% using null arbitrary cognate objects in non-anaphoric contexts in L2. After the three sub-groups were aggregated into one group for analysis, the non-parametric Mann-Whitney Test results also show that there is a statistically significant difference in using null arbitrary cognate objects in non-anaphoric contexts in the oral task between the entire Chinese group (N = 85) and the controls (U =473.000, z = -4.045, p = 0.000).

Table 6.4 shows that more than half (i.e. 43 out of 85 Chinese) obtained 100% accuracy in the use of null arbitrary cognate objects. Table 6.4 also indicates that 69.41% of Chinese participants (i.e. 59 out of 85 Chinese) used null arbitrary cognate objects at a rate of 80% - 100% accuracy. Table 6.5 shows that there was increasing mean percentage accuracy of using null arbitrary cognate objects in non-anaphoric contexts in the oral

task by the three Chinese sub-groups, ranging from the high-beginner, low-intermediate to advanced English levels (i.e. from 68.889%, 79.412% to 89.815% accuracy).

6.2.2 Oral task: Three Chinese sub-groups were aggregated into one group for analysis

Firstly, I examined statistical differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the oral task between each of the three Chinese sub-groups and the controls. The non-parametric Mann-Whitney Test results revealed that each Chinese sub-group (high-beginner, low-intermediate, and advanced) was statistically significantly different from the controls on using null arbitrary cognate objects in non-anaphoric contexts in the oral task (high-beginner and the controls: $U = 66$, $z = -4.068$, $p = 0.002$; low-intermediate and the controls: $U = 187$, $z = -3.857$, $p = 0.000$; advanced and the controls: $U = 220$, $z = -3.583$, $p = 0.000$).

However, as explained above, these descriptive differences would only affect the further presentation of data if there were significant between-group differences. I therefore examined the statistical differences between each of the three sub-groups. If statistically significant differences existed, the three sub-groups should be separated for analysis in this study, in line with Yuan (1997). Otherwise, if there was no effect for proficiency, the three sub-groups should be aggregated into one Chinese group. I first looked at (i) statistical differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the oral task between sub-groups at different English levels, and also (ii) the correlation between the percentage accuracy of using null arbitrary cognate objects by sub-groups and their corresponding English proficiency levels (i.e. English test scores).

The following are the results which ultimately help determine that the three sub-groups should be aggregated into one group for analysis. When examining the statistical differences between the sub-groups, the results indicate that there were no

statistically significant differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the oral task between sub-groups (high-beginner and low-intermediate: $U = 211.500$, $z = -0.998$, $p = 0.318$; low-intermediate and advanced: $U = 517.500$, $z = -1.204$, $p = 0.229$; high-beginner and advanced: $U = 188.500$, $z = -1.811$, $p = 0.070$). Secondly, I examined the relationship between the percentage accuracy of using null arbitrary cognate objects in non-anaphoric contexts by sub-groups and their corresponding English test scores, using non-parametric analysis of correlational significance and effect size. The Spearman's rho correlation between the percentage accuracy of using null arbitrary cognate objects in non-anaphoric contexts by Chinese and their corresponding English test scores was not quite at significance, and the effect size (R^2) of the correlation was small (rho = 0.209; N = 85; $p = 0.055$; $R^2 = 0.04$). Cohen (1992) defined effect sizes for R^2 and $R^2 = 0.01$ is a small effect; $R^2 = 0.09$ is a medium effect. In other words, the results ($R^2 = 0.04$; $p = 0.055$) show that there was no statistically important relationship between English proficiency levels (test scores) of each sub-group and the percentage accuracy of using null arbitrary cognate objects in non-anaphoric contexts in the oral task. Despite the descriptive differences between groups, the three Chinese sub-groups were therefore aggregated into one group for analysis due to (i) no statistically significant differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the oral task between each of three sub-groups, and (ii) the small effect size of the above Spearman's rho correlation.

6.2.3 Oral task: Self-corrections

When examining whether participants can use a null arbitrary cognate object or an overt object in the oral task, I counted their final utterances but also reported self-corrections in table 6.6 (see section 5.8). The phenomenon of the presence and absence of self-corrections was reported here because self-corrections may have an implication for acquisition of null objects. The following table lists the type and number of

self-corrections when producing an overt or a null object among the Chinese. No

self-correction was found among the controls in this study. The total possible tokens

were 1,275 (85 participants x 5 target verbs with 3 tokens each, of which 1,045 were null,

230 overt).

Table 6.6 Self-corrections in the oral task

Oral task: Chinese (N = 85)	Self-corrections	Number of tokens
Using null arbitrary cognate objects (1,045 tokens)	None (No self-correction from using an overt object to producing a null arbitrary cognate object)	0 out of 1,045 tokens (i.e. 0% self-correction)
Using overt objects (230 tokens)	Yes (Self-corrections from using a null arbitrary cognate object to producing an overt object)	5 out of 230 tokens (i.e. 2.2% self-corrections)

Table 6.6 reveals that there was no self-correction after using an overt object in

non-anaphoric contexts in the oral task by Chinese (out of 1,045 non-anaphoric

contexts). That is, no Chinese used an overt object and then omitted it. Out of 230 tokens

for using overt objects in non-anaphoric contexts in the oral task, 2.2% (5 out of 230

tokens) self-correction from using a null arbitrary cognate object to producing an overt

object was found. The implications of self-correction for the acquisition of null arbitrary

cognate objects will be discussed in section 7.1.3.

6.3 Written task: Using null arbitrary cognate objects in English

6.3.1 Written task: Descriptive statistics

In the same vein as the oral task, this written task also addressed the first research

question and tested Hypothesis 1a: Chinese can acquire the Null ACO rule which is not

instantiated in L1 (see section 6.2.1 for the same hypothesis testing, variables and

potential experimental outcomes). This written task aimed to find out whether Chinese

can use null arbitrary cognate objects in non-anaphoric contexts such as in *We are*

unwilling to pay someone HK$ 60 an hour to iron____. The same population of

Chinese participants (N = 85) and the same target verbs (i.e. *draw, drink, drive, iron* and

read) were used across those two tasks. In this written task, there were 15 tokens of

target verbs and 15 distractors. The following are descriptive statistics for using null

arbitrary cognate objects in non-anaphoric contexts in the written task by Chinese and

the controls.

Table 6.7 Descriptive statistics for using null arbitrary cognate objects in the written task

Using null arbitrary cognate objects in the written task	Mean (% accuracy)	Std. Deviation (SD)	Min. (% accuracy)	Max. (% accuracy)
The entire Chinese group (N =85)	79.765	18.183	13.333	100.000
Controls (N = 22)	95.152	6.234	80.000	100.000

Table 6.8 Cumulative percentages of Chinese: Using null arbitrary cognate objects in the written task

% accuracy: Using null arbitrary cognate objects in the written task	Cumulative no. of Chinese (total: 85)	Cumulative percentages of Chinese
100% (15 tokens)	18	21.18%
80.00% − 100% (12 - 15 tokens)	52	61.18%
73.33 − 100% (11 − 15 tokens)	64	75.29%
60.00 − 100% (9 - 15 tokens)	77	90.59%
53.33 − 100% (8 - 15 tokens)	79	92.94%
40.00% − 100% (6 -15 tokens)	83	97.65%
33.33% − 100% (5 - 15 tokens)	84	98.82%
13.33% − 100% (2 - 15 tokens)	85	100.00%
0.00% − 100% (0 - 15 tokens)	85	100.00%

Table 6.9 Descriptive statistics for using null arbitrary cognate objects in the written task (sub-groups)

Using null arbitrary cognate objects in non-anaphoric contexts in the written task	Mean (% accuracy)	Std. Deviation (SD)	Min. (% accuracy)	Max. (% accuracy)
At high-beginner English level (N = 15)	76.889	18.664	40.000	100.000
At low- intermediate English level (N = 34)	78.431	20.437	13.333	100.000
At advanced English level (N = 36)	82.222	15.776	46.667	100.000
Controls (N = 22)	95.152	6.234	80.000	100.000

Table 6.7 indicates that the controls obtained a mean of 95.15% accuracy in the use of null arbitrary cognate objects in non-anaphoric contexts in the written task while the entire Chinese group obtained a mean of 79.76% accuracy in the use of null arbitrary cognate objects in this regard (i.e. 20.24% overt objects). Table 6.8 indicates that 75.29% of Chinese participants (i.e. 64 out of 85 Chinese) obtained 73.33% - 100% accuracy in the use of null arbitrary cognate objects. Table 6.9 reveals that there was increasing mean percentage accuracy of using null arbitrary cognate objects in non-anaphoric contexts in the written task by the three Chinese sub-groups, ranging from the high-beginner, low-intermediate to advanced English levels (i.e. from 76.889%, 78.431% to 82.222% accuracy).

6.3.2 Written task: Three Chinese sub-groups are aggregated into one group for analysis

In what follows, I examined the statistical differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the written task between each Chinese sub-group and the controls. The non-parametric Mann-Whitney Test results reveal that each

sub-group (high-beginner, low-intermediate, and advanced) is statistically significantly different from the controls in this regard (high-beginner and the controls: $U = 55$, $z = -3.518$, $p = 0.000$; low-intermediate and the controls: $U = 167$; $z = -3.570$, $p = 0.000$; advanced and the controls: $U = 199$, $z = -3.253$, $p = 0.001$). In the same vein as the oral task, one important issue is whether the three sub-groups should be aggregated into one Chinese group for analysis. I firstly examined (i) the statistical differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the written task between sub-groups, and also (ii) the correlation between the percentage accuracy of using null arbitrary cognate objects in non-anaphoric contexts by sub-groups and their corresponding English test scores. The non-parametric Mann-Whitney Test results indicate that there were no statistically significant differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the written task between three sub-groups (high-beginner and low-intermediate: $U = 232.500$, $z = -.493$, $p = 0.622$; low-intermediate and advanced: $U = 562.000$, $z = -.595$, $p = 0.552$; high-beginner and advanced: $U = 225.000$, $z = -.941$, $p = 0.347$). Secondly, the Spearman's rho correlation between the percentage accuracy of using null arbitrary cognate objects in non-anaphoric contexts in the written task by Chinese and their corresponding English test scores was not significant, and the effect size of the correlation is small ($r = 0.052$; $N = 85$; $p = 0.639$; $R^2 = 0.0027$). In other words, the relationship between the English proficiency levels (test scores) and using null arbitrary cognate objects in non-anaphoric contexts in the written task between three sub-groups was small. Due to (i) no statistically significant differences between three sub-groups in using null arbitrary cognate objects in non-anaphoric contexts in the written task and (ii) the small effect size of the Spearman's rho correlation, three Chinese sub-groups were aggregated into one group for analysis. As an entire Chinese group was used for analysis, the non-parametric Mann-Whitney Test results indicate that there was a statistically significant difference in

using null arbitrary cognate objects in non-anaphoric contexts in the written task between Chinese (N = 85) and the controls (U =421, z = -4.028, p = 0.000).

6.4 Triangulating the results of both oral and written tasks: Using correlation

6.4.1 Oral and written tasks: A strong and positive relationship

To enhance the reliability of findings of this study, the results of both oral and written tasks were tested for any significant correlation between the means of percentage accuracy in the use of null arbitrary cognate objects in both oral and written tasks. It is expected that an individual can use null arbitrary cognate objects in different tasks including both oral and written tasks in this study. That is to say, the correlation coefficient should be strong and positive. The output in table 6.10 indicates that, for the correlation between using null arbitrary cognate objects in non-anaphoric contexts across the oral and written tasks, the correlation coefficient was rho = 0.494, p = 0.000, N = 85, and effect size was R^2 = 0.244; Cohen (1992): R^2 = 0.25 is a large effect). The effect size in this case was large and positive and this has demonstrated that there was a significant strong positive relationship between using null arbitrary cognate objects in non-anaphoric contexts across two tasks.

Table 6.10 A strong and positive relationship between using null arbitrary cognate objects in the oral and written tasks by Chinese

Chinese (N = 85)			Null arbitrary cognate object (oral task)	Null arbitrary cognate object (written task)
Spear man's rho	Null arbitrary cognate object (oral task)	Correlation Coefficient	1.000	.494**
		Sig. (2-tailed)	.	.000
		N	85	85
	Null arbitrary cognate object (written task)	Correlation Coefficient	.494**	1.000
		Sig. (2-tailed)	.000	.
		N	85	85

(** significant correlation, p < 0.001)

6.4.2 Oral and written tasks: Individual verbs and using null arbitrary cognate objects

With respect to the group of five target verbs, Chinese can use null arbitrary cognate objects in non-anaphoric contexts in both oral and written tasks with the mean percentage accuracy of 81.961% and 79.765%. I further examined the use of null arbitrary cognate objects with respect to each of five target verbs (*draw, drink, drive, iron* and *read*) and across two tasks (see section 5.5). The target verb which carries the highest percentage accuracy in the use of null arbitrary cognate objects was ranked 1st and the lowest one was ranked 5th.

Table 6.11 Percentage accuracy of using null arbitrary cognate objects with respect to target verbs

	Oral task		Written task	
Using null cognate objects in non-anaphoric contexts	Chinese (N = 85) (% accuracy)	Controls (N = 22) (% accuracy)	Chinese (N = 85) (% accuracy)	Controls (N = 22) (% accuracy)
The group of five target verbs	81.96%	100%	79.76%	95.15%
Iron	72.55% (5th)	100%	73.73% (5th)	98.49%
Read	79.61% (4th)	100%	76.47% (4th)	89.39%
Draw	81.96% (3rd)	100%	78.43% (3rd)	96.97%
Drink	83.53% (2nd)	100%	79.22% (2nd)	92.42%
Drive	92.16% (1st)	100%	90.98% (1st)	98.49%

Table 6.11 shows that oral results for Chinese ranged from 72.55% to 92.16% accuracy in the use of arbitrary cognate objects in non-anaphoric contexts in the oral task with respect to each target verb. Table 6.11 also indicates that written results for Chinese ranged from 73.73% to 90.98% accuracy in the use of null arbitrary cognate objects in non-anaphoric contexts with respect to each target verb. The above results reveal that Chinese, across both tasks, obtained increasingly high percentage mean accuracy of using null arbitrary cognate objects in non-anaphoric contexts in the same order of success across the five individual target verbs. Specifically, the verb *drive* carries the highest percentage accuracy of 92.16% and 90.98% in the oral and written tasks whereas the verb *iron* carries the lowest ones of 72.55% and 73.73% in the oral and written tasks.

6.4.3 Oral/written task and individual verbs: Finding statistically significant differences between Chinese and the controls

I firstly examined the statistical differences in the use of null arbitrary cognate objects in the oral task by Chinese and the controls with respect to individual target verbs. The Mann-Whitney Test results indicate that, other than the verb *drive* among five target

verbs, there were statistically significant differences in the use of null arbitrary cognate objects in the oral task between Chinese and the controls (*iron*: U =638.000, z = -3.014, p = 0.003; *draw*: U =682.000, z = -2.717, p = 0.007; *drink*: U =704.000, z = -2.570, p = 0.010; *read*: U =616.000, z = -3.148, p = 0.002).   As for the verb *drive* (U =792.500, z = -1.944, p = 0.052), the results reveal that there was no statistically significant difference in the use of null arbitrary cognate objects in non-anaphoric contexts in the oral task between Chinese and the controls.

Now, I turn to investigate the statistical differences in the use of null arbitrary cognate objects in the written task by Chinese and the controls. The Mann-Whitney Test results indicate that, other than the verbs *drive* and *read* among five target verbs, there were statistically significant differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the written task between the entire Chinese group and the controls (*iron*: U =559.500, z = -3.397, p = 0.001; *draw*: U =609.000, z = -2.960, p = 0.003; *drink*: U =710.500, z = -1.994, p = 0.046). As for the verbs *drive* and *read*, the results indicate that there were no statistically significant differences in the use of null arbitrary cognate objects in non-anaphoric contexts in the written task between Chinese and the controls (*drive*: U =789.000, z = -1.733, p = 0.083; *read*: U =747.500, z = -1.624, p = 0.104). Briefly put, for the verb *drive*, Chinese had no statistically significant differences in the use of null arbitrary cognate objects in both oral and written tasks when compared with the controls. For the verb *read*, Chinese also had no statistically significant difference to controls in the use of null arbitrary cognate objects in the written task.

To sum up, Chinese (N=85) obtained a mean of 81.961% accuracy in the use of null arbitrary cognate objects in the oral task whereas they obtained a mean of 79.765% accuracy in the written task. More than a half (i.e. 43 out of 85 Chinese) obtained 100% accuracy in the use of null arbitrary cognate objects in the oral task. There was a strong and positive relationship (correlation coefficient: 0.494; p = 0.000) between the use of

null arbitrary cognate objects in non-anaphoric contexts across two tasks. The above results showed success in the acquisition of null arbitrary cognate objects in the oral and written tasks.

6.5 AJIT: The possibility of anaphoric object drop in English

The previous results showed success in acquisition of null arbitrary cognate objects in L2 targets, but I now turn to test resistant L1 effects leading to anaphoric object drop in L2. Hypothesis 2 in this study regards the no ambiguity of null arguments: whether Chinese accept anaphoric object drop or a null arbitrary cognate object, but not both. The AJIT in this study examined to what extent participants accept anaphoric object drop in English, particularly with respect to target verbs that allow a null arbitrary cognate object (e.g. *draw, drink*). In other words, participants interpret an internally-licensed null arbitrary cognate object in English as anaphoric object drop. The following is an exemplar extracted from the AJIT (see figure 6.3). For instance, as in *Susan irons Paul's shirts before he goes to work. Paul doesn't iron [e]at weekends*, participants accept the null object in the second sentence but interpret the object gap as anaphoric object drop. English generally does not allow anaphoric object drop, so I called this 'an interpretation problem' because *Paul doesn't iron at weekends* is correct in grammar (see section 5.7.3). Interestingly, no one would know what interlocutors interpret *Paul doesn't iron at weekends* if we do not tap their interpretation of the object gap. This task therefore aimed to find out the (im)possibility of anaphoric object drop when participants are given a possible discourse antecedent. As for the impossibility of anaphoric object drop, it includes either accepting a null arbitrary cognate object as it is in non-anaphoric contexts or supplying an object pronoun as it is in anaphoric contexts. This AJIT task primarily focused on the possibility of anaphoric object drop.

Figure 6.3 An exemplar in the AJIT ('an interpretation problem' – the possibility of anaphoric object drop)

If the sentence is CORRECT, (i) tick the Correct box and (ii) circle the BEST answer (a) OR (b).

If the sentence is INCORRECT, (i) tick the Incorrect box, (ii) write any changes on the line, and (iii) circle the best answer (a) OR (b).

Susan irons Paul's shirts before he goes to work.   Paul doesn't iron at weekends.

√   Correct

    Circle (a) or (b):

    Paul doesn't iron a. his shirts   b. anything   at weekends.

□   Incorrect (write any changes):_____

    Circle (a) or (b):

    Paul doesn't iron a. his shirts   b. anything   at weekends.

It should be noted that the results of allowing anaphoric object drop in this AJIT (research question 2) were used together with the results of allowing null arbitrary cognate objects in the oral/written task in section 6.4 (research question 1) for testing hypothesis 2a: there is no ambiguity of null arguments (research question 3). More specifically, if a null argument can only have one interpretation, a statistically significant negative correlation between accepting anaphoric object drop and a null arbitrary cognate object should be the result. Macky and Gass (2005: 284) point out that "in correlation research no variables are manipulated. Correlation research attempts to determine the relationship between or among variables." The following are hypotheses, potential experimental outcomes and variables when testing for any statistically significant correlation between data obtained from the research questions 1 and 2.

The AJIT and the oral/written task: Hypotheses

Hypothesis 2a: there is no ambiguity of null arguments. (Chinese learners of English can accept anaphoric object drop or a null arbitrary cognate object, but not both, in their interlanguage.)

Potential experimental outcome:

This predicts that there is a statistically significant negative correlation between allowing anaphoric object drop and allowing a null arbitrary cognate object.

The alternative hypothesis 2b: some degree of ambiguity of null arguments can be tolerated. (Chinese learners of English accept both anaphoric object drop and a null arbitrary cognate object in their interlanguage.)

Potential experimental outcome:

This predicts that there is no statistically significant negative correlation between allowing anaphoric object drop and allowing a null arbitrary cognate object.

Two variables:

1. Measure of the possibility of anaphoric object drop in the AJIT

2. Measure of the possibility of a null arbitrary cognate object in the oral/written task

The results of the above test will be shown in sections 6.6 and 6.7 that hypothesis 2b is borne out. In what follows, descriptive statistics of the (im)possibility of anaphoric object drop (specific and non-specific) are presented first in sections 6.5.1 - 6.5.5.

6.5.1 AJIT: Descriptive statistics – The (im)possibility of anaphoric object drop in English

The following tables show the possibility and impossibility of anaphoric object drop by Chinese and the controls, in mean terms overall (table 6.12) and by individual verbs (table 6.13). When participants accept a null object but link it to a possible discourse antecedent, then it is counted as the possibility of anaphoric object drop (see section 5.8). In this AJIT, 25 distractors and 25 target verbs were used randomly.

Table 6.12 Descriptive statistics – The (im)possibility of anaphoric object drop in English

(%) The possibility of anaphoric object drop in English (25 tokens of target verbs for each participant)	Mean (%)	Std. Deviation (SD)	Min. (%)	Max. (%)
Chinese (N = 85)	16.56	14.503	0.00	56.00
Controls (N = 22)	3.64	7.397	0.00	32.00
(%) The impossibility of anaphoric object drop in English (25 tokens of distractor verbs for each participant)				
Chinese (N = 85)	83.44	14.503	44.00	100.00
Controls (N = 22)	96.36	7.397	68.00	100.00

6.5.2 AJIT: Individual verbs and the (im)possibility of anaphoric object drop in English

Table 6.13 Verbs: The (im)possibility of anaphoric object drop in English

	The possibility of anaphoric object drop in English		The impossibility of anaphoric object drop in English	
	Chinese (N = 85)	Controls (N = 22)	Chinese (N = 85)	Controls (N = 22)
The group of five verbs	16.56%	3.45%	83.44%	96.55%
Iron	15.29%	1.82%	84.71%	98.18%
Read	19.29%	5.45%	80.71%	94.55%
Draw	16.47%	0.00%	83.53%	100.00%
Drink	10.12%	1.82%	89.88%	98.18%
Drive	21.65%	8.18%	78.35%	91.82%

Table 6.12 shows that Chinese accepted anaphoric object drop at a rate of 16.56% in English, that is, they had the impossibility of anaphoric object drop at a rate of 83.44% in English. Table 6.13 indicates that, with respect to each target verb, the possibility of anaphoric object drop ranged from a rate of 10.12% to 21.65%. In other words, the impossibility of anaphoric object drop ranged from a rate of 78.35% to 89.88%.

As for the impossibility of anaphoric object drop in English, there were statistically significant differences in this regard between Chinese and the controls (*draw*: U =410.000, z = -4.044, p = 0.000; *drink*: U =558.000, z = -2.896, p = 0.004; *drive*: U =560.000, z = -2.548, p = 0.011; *iron*: U =537.000, z = -2.945, p = 0.003; *read*: U =557.000, z = -2.629, p = 0.009). As for the possibility of anaphoric object drop in English, there were statistically significant differences in this regard between Chinese and the controls, with respect to each target verb (*draw*: U =451.000, z = -4.221, p = 0.000; *drink*: U =648.000, z = -2.682, p = 0.007; *drive*: U =625.500, z = -2.573, p = 0.010; *iron*: U =584.000, z = -3.136, p = 0.002; *read*: U =598.000, z = -2.869, p = 0.004).

6.5.3 AJIT: Percentages of allowing anaphoric object drop and cumulative percentages of Chinese

The shaded section in the following table 6.14 shows that only 1.18% of Chinese participants (i.e. one out of 85 Chinese) allowed anaphoric object drop at the highest mean of 56%. Table 6.14 also indicates that 20% of Chinese participants (i.e. 17 out of 85 Chinese) rejected anaphoric object drop in the AJIT (i.e. 0% anaphoric object drop).

Table 6.14 Percentages of allowing anaphoric object drop and cumulative percentages of Chinese

Anaphoric object drop	(out of 25 tokens)	No. of Chinese (N = 85)	% of total no. of Chinese	Cumulative no. of Chinese	Cumulative %
0%	0	17	20.00	17	20.00
4%	1	12	14.12	29	34.10
8%	2	6	7.06	35	41.20
12%	3	9	10.59	44	51.80
16%	4	4	4.71	48	56.50
20%	5	8	9.41	56	65.90
24%	6	5	5.88	61	71.80
28%	7	5	5.88	66	77.60
32%	8	6	7.06	72	84.70
36%	9	6	7.06	78	91.80
40%	10	4	4.71	82	96.50
44%	11	1	1.18	83	97.60
48%	12	0	0.00	83	97.60
52%	13	1	1.18	84	98.80
56%	14	1	1.18	85	100.00
60%	15	0	0.00	-	-
64%	16	0	0.00	-	-
68%	17	0	0.00	-	-
72%	18	0	0.00	-	-
76%	19	0	0.00	-	-
80%	20	0	0.00	-	-
84%	21	0	0.00	-	-
88%	22	0	0.00	-	-
92%	23	0	0.00	-	-
96%	24	0	0.00	-	-
100%	25	0	0.00	-	-

6.5.4 AJIT: The possibility of anaphoric object drop (specific and non-specific)

As discussed in section 5.7.3.3, I further examined what type(s) of anaphoric object drop, specific or non-specific, that Chinese would allow in the AJIT. Out of 25 test items in the AJIT, there were 12 test items with a definite antecedent that allows anaphoric specific object drop and 13 test items with an indefinite antecedent that generally allows anaphoric non-specific object drop. Table 6.15 indicates that there were 18.04% anaphoric specific object drop and 15.20% anaphoric non-specific object drop, across respective types of anaphoric object drop in English in the AJIT.

Table 6.15 The possibility of anaphoric object drop (specific and non-specific)

(%) The possibility of anaphoric object drop in English	Chinese (N = 85)
Anaphoric object drop (specific and non-specific)	16.56% (352 out of 2,125 tokens)
Specific object drop	18.04% (184 out of 1,020 tokens)
Non-specific object drop	15.20% (168 out of 1,105 tokens)

6.5.5 AJIT: A strong and positive correlation between anaphoric specific and non-specific object drop

Table 6.16 A positive and strong correlation between the possibility of anaphoric specific and non-specific object drop by Chinese

The entire group of 5 target verbs			The possibility of anaphoric specific object drop	The possibility of anaphoric non-specific object drop
Spearman's rho	The possibility of anaphoric specific object drop	Correlation Coefficient	1.000	0.674**
		Sig. (2-tailed)	.	0.000
		N	85	85
	The possibility of anaphoric non-specific object drop	Correlation Coefficient	0.674**	1.000
		Sig. (2-tailed)	0.000	.
		N	85	85

(** significant correlation, p < 0.001)

The output in table 6.16 indicates that the correlation coefficient (rho = 0.674) between the possibility of (i) anaphoric specific object drop and (ii) anaphoric non-specific object drop in L2 English found the effect size of the correlation was large (rho = 0.674, p = 0.000), N = 85, and R^2 = 0.454; R^2 = 0.25 is a large effect). That is, the correlation coefficient is highly reliable, and the importance of this relationship was large and positive. In section 3.4.3, I argue that Chinese allow both non-specific and specific object drop because the null object argument [uD, N] in Chinese can be valued from an antecedent, with a referential index (definite antecedent) or a referential variable (indefinite antecedent). In both cases, the N of null [uD, N] is recovered by virtue of the overt noun of the antecedent (see discussion in section 7.2.1).

6.6 AJIT and oral task: Testing for correlation

As discussed in section 3.4.4.2, the final research question tested whether the hypothesis of no ambiguity of null arguments can hold, as proposed by Cheng and Sybesma (1998). In other words, one is expected to accept anaphoric object drop or a null arbitrary cognate object, but not both. Using correlation, I examined whether there is a statistically significant correlation between the possibility of anaphoric object drop in the AJIT and the impossibility of a null arbitrary cognate object in the oral/written tasks. The same population of participants and the same target verbs were used across all tasks in this study. The AJIT examined to what extent Chinese would accept anaphoric object drop in English. Second, the oral and written tasks investigated to what extent Chinese can and cannot use null arbitrary cognate objects in English. Hence, using statistical correlation to find out the correlation between those tasks can reveal the connection between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (testing the hypothesis of no ambiguity of null arguments). Prior to finding a statistical correlation across two tasks, I turn to take a preliminary glance at what extent Chinese accepted anaphoric object drop when they accepted a null

arbitrary cognate object at the rate of 100%. If those cases found, it appears to reveal that Chinese had an interlanguage grammar where both types of object drop are accepted, addressing the third research question in section 5.1.

6.6.1 AJIT and oral task: Individual cases allowing anaphoric object drop (0% - 100%) and a null arbitrary cognate object (100%)

The following are the descriptive statistics about individual cases of Chinese allowing anaphoric object drop (0% to 100%) in the AJIT and a null arbitrary cognate object in the oral task (100%). The hypothesis of no ambiguity of null arguments predicts that an individual would not accept any anaphoric object drop when he or she has obtained 100% accuracy in the use of null arbitrary cognate objects with respect to the same target verb. In other words, a strong correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object is expected. The results, however, reveal that some Chinese accepted anaphoric object drop even when they accepted null arbitrary cognate objects at a rate of 100% accuracy.

Table 6.17 Descriptive statistics - Individual cases (Chinese) allowing anaphoric object drop (0% -100%) and a null arbitrary cognate object (100%) (Chinese)

	100% accuracy in the use of null arbitrary cognate objects (i.e. three test items for each target verb in the oral task)					
The possibility of anaphoric object drop in English with respect to individual verbs (in the AJIT)	*Draw*	*Drink*	*Drive*	*Iron*	*Read*	425 = (5 verbs x 85 Chinese)
0% (none out of five test items)	34	43	29	32	27	165
20% (one out of five test items)	16	17	16	15	13	77
40% (two out of five test items)	8	3	16	7	11	36
60% (three out of five test items)	1	3	0	10	3	17
80% (four out of five test items)	1	0	2	1	3	7
100% (five out of five test items)	0	0	0	1	0	1
*303 is a sub-total (out of 425); other percentages (non-100% accuracy) of null arbitrary cognate objects in the oral task are not reported in this table.						303 *

The shaded section in table 6.17 above highlights the number of cases of Chinese who accepted anaphoric object drop at a rate of 40% to 100% and a null arbitrary cognate object at a rate of 100% in this study. With respect to the same target verb, 61 out of 425 cases (i.e. 14.35%) of Chinese individuals accepted both anaphoric object drop at a rate of 40% to 100% and null arbitrary cognate objects at a rate of 100% accuracy. In addition, 25 out of 425 cases (i.e. 5.88%) of Chinese individuals accepted both anaphoric object drop at a rate of 60% to 100% and null arbitrary cognate objects at a rate of 100% accuracy.

The above results reveal that some Chinese accepted both types of object drop in their interlanguage grammar and it appears that the hypothesis of no ambiguity of null arguments does not hold. Now, I turn to look at this phenomenon of allowing both types of null objects in L1 English among the native English speaker controls, with the aim to explore more about the hypothesis of no ambiguity of null arguments.

Table 6.18 Descriptive statistics - Individual cases (Controls) allowing anaphoric object drop (0% -100%) and null arbitrary cognate objects (100%) (native English speakers)

	100% accuracy in the use of null arbitrary cognate objects (i.e. three test items for each target verb in the oral task)					
The possibility of anaphoric object drop in English with respect to individual verbs (in the AJIT)	*Draw*	*Drink*	*Drive*	*Iron*	*Read*	110 = (5 verbs x 22 native English speakers)
0% (none out of five test items)	22	20	16	20	18	96
20% (one out of five test items)	0	2	4	2	3	11
40% (two out of five test items)	0	0	1	0	1	2
60% (three out of five test items)	0	0	1	0	0	1
80% (four out of five test items)	0	0	0	0	0	0
100% (five out of five test items)	0	0	0	0	0	0
*110 is the total; 22 native English speakers produced all null arbitrary cognate objects in the oral task.						110*

The shaded section in the table 6.18 above also highlights the number of the native English speakers allowing anaphoric object drop at a rate of 20% to 60% and a null arbitrary cognate object at a rate of 100% in this study. With respect to the same target verb, 11 out of 110 cases (i.e. 10%) of native English speakers accepted both anaphoric object drop at a rate of 20% and null arbitrary cognate objects at a rate of 100% accuracy. In addition, 14 out of 110 cases (i.e. 12.73%) of native English speakers accepted both anaphoric object drop at a rate of 20% to 60% and null arbitrary cognate objects at a rate of 100% accuracy.

6.6.2 AJIT and oral task: No statistically significant correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (a group of five verbs)

Firstly, with respect to the group of five target verbs, I used data of (i) the possibility of anaphoric object drop in AJIT and (ii) its corresponding data of the impossibility of a null arbitrary cognate object in the oral task for 85 Chinese individuals. Using Spearman's correlation, I looked to see if there was any correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object. It was because if there is no ambiguity of null arguments, then Chinese accept anaphoric object drop or a null arbitrary cognate object, but not both.

Table 6.19 Correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (a group of five verbs)

The entire group of 5 target verbs			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (oral task)
Spearman's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	0.163
		Sig. (2-tailed)	.	0.136
		N	85	85
	The impossibility of a null arbitrary cognate object (oral task)	Correlation Coefficient	0.163	1.000
		Sig. (2-tailed)	0.136	.
		N	85	85

The output in table 6.19 indicates that the correlation coefficient (rho = 0.163, p=0.136) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the oral task found the effect size of the correlation was small (rho = 0.163, p = 0.136, N = 85, and R^2 = 0.026; Cohen (1992): R^2 = 0.01 is a small effect, R^2 = 0.09 is a medium effect). That is, the correlation coefficient was not highly reliable, and the importance of this relationship was small.

6.6.3 AJIT and oral task: No statistically significant correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (with respect to individual verbs)

In the previous section 6.6.2, the correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object across all verbs was not significant. I now turn to check this against individual verbs. Assume the hypothesis of no ambiguity of null arguments holds, an individual is expected to accept either anaphoric object drop or a null arbitrary cognate object for a same verb, but not both. This task aimed to find out the correlation in this regard with reference to five individual target verbs namely *draw*, *drink*, *drive*, *iron* and *read*. The correlation results are reported in the following tables, with reference to each target verb accordingly.

6.6.3.1 Individual verbs: *draw* (AJIT and oral task)

Table 6.20 Correlation between the possibility of anaphoric object drop and the

impossibility of a null arbitrary cognate object (the verb *draw*)

Individual verb: *draw*			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (oral task)
Spear man's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	0.172
		Sig. (2-tailed)	.	0.116
		N	85	85
	The impossibility of a null arbitrary cognate object (oral task)	Correlation Coefficient	0.172	1.000
		Sig. (2-tailed)	0.116	.
		N	85	85

The output in table 6.20 indicates that the correlation coefficient (rho = 0.172, p = 0.116)

between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility

of a null arbitrary cognate object in the oral task found the effect size of the correlation

was small (rho = 0.172, p = 0.116, N = 85, and R^2 = 0.029; Cohen (1992): R^2 = 0.01 is a

small effect), meaning the correlation coefficient was not highly reliable, and the

importance of this relationship was small.

6.6.3.2 Individual verbs: *drive* (AJIT and oral task)

Table 6.21 Correlation between the possibility of anaphoric object drop and the

impossibility of a null arbitrary cognate object (the verb *drive*)

Individual verb: *drive*			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (oral task)
Spear man's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	- 0.091
		Sig. (2-tailed)	.	0.406
		N	85	85
	The impossibility of a null arbitrary cognate object (oral task)	Correlation Coefficient	- 0.091	1.000
		Sig. (2-tailed)	0.406	.
		N	85	85

The output in table 6.21 indicates that the correlation coefficient (rho = - 0.091) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the oral task found the effect size of the correlation was small (rho = - 0.091, p = 0.406, N = 85, and R^2 = 0.0083), meaning the correlation coefficient was not highly reliable, and the importance of this relationship was small.

6.6.3.3 Individual verbs: *drink* (AJIT and oral task)

Table 6.22 Correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (the verb *drink*)

Individual verb: *drink*			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (oral task)
Spear man's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	0.242
		Sig. (2-tailed)	.	0.026
		N	85	85
	The impossibility of a null arbitrary cognate object (oral task)	Correlation Coefficient	0.242	1.000
		Sig. (2-tailed)	0.026	.
		N	85	85

The output in table 6.22 indicates that, although the relationship is statistical (p = 0.026), the correlation coefficient (rho = 0.242) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the oral task found the effect size of the correlation is small (rho = 0.242, p = 0.026, N = 85, and R^2 = 0.058). I realize that the relationship is statistically significant, but the effect size is small and I adopted Larson-Hall's point (2012: 468) arguing that "looking at effect size is a much more stable and informative practice than caring about whether the p-value is close to an arbitrary cut-off point". Hence, the correlation coefficient in this case was

still not reliable and the importance of this relationship was small (also see findings for *drink* in section 6.7.3).

6.6.3.4 Individual verbs: *iron* (AJIT and oral task)

Table 6.23 Correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (the verb *iron*)

Individual verb: *iron*			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (oral task)
Spear man's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	0.066
		Sig. (2-tailed)	.	0.546
		N	85	85
	The impossibility of a null arbitrary cognate object (oral task)	Correlation Coefficient	0.066	1.000
		Sig. (2-tailed)	0.546	.
		N	85	85

The output in table 6.23 indicates that the correlation coefficient (rho = 0.066, p = 0.546) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the oral task found the effect size of the correlation was small (rho = 0.066, p = 0.546, N = 85, and R^2 = 0.0043), meaning the correlation coefficient was not highly reliable, and the importance of this relationship was small.

6.6.3.5 Individual verbs: *read* (AJIT and oral task)

Table 6.24 Correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (the verb *read*)

Individual verb: read			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (oral task)
Spear man's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	0.044
		Sig. (2-tailed)	.	0.686
		N	85	85
	The impossibility of a null arbitrary cognate object (oral task)	Correlation Coefficient	0.044	1.000
		Sig. (2-tailed)	0.686	.
		N	85	85

The output in table 6.24 indicates that the correlation coefficient (rho = 0.044, p = 0.686) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the oral task found the effect size of the correlation was small (rho = 0.044, p = 0.686, N = 85, and R^2 = 0.0019), meaning the correlation coefficient was not highly reliable, and the importance of this relationship was small.

6.6.3.6 Summary: AJIT and oral task – No statistically significant correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object

With respect to each of five individual target verbs in the oral task, each correlation coefficient between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the oral task found the effect size of the correlation was small, meaning the correlation coefficient was not highly reliable, and the importance of this relationship was small. To further examine any correlation in this

regard, I now turn to examine the possibility of anaphoric object drop in AJIT and the impossibility of a null arbitrary cognate object in the written task.

6.7 AJIT and written task: Testing for correlation

Now I repeat the systematic examination of possible correlations between the possibility of anaphoric object drop in the AJIT and the impossibility of a null arbitrary cognate object in the written task with respect to the five individual target verbs, to triangulate against the lack of statistically significant correlation found above in the oral task.

6.7.1 Individual verbs: *draw* (AJIT and written task)

Table 6.25 Correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (the verb *draw*)

Individual verb: *draw*			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (written task)
Spear man's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	0.082
		Sig. (2-tailed)	.	0.453
		N	85	85
	The impossibility of a null arbitrary cognate object (written task)	Correlation Coefficient	0.082	1.000
		Sig. (2-tailed)	0.453	.
		N	85	85

The output in table 6.25 indicates that the correlation coefficient (rho = 0.082, p = 0.453) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the written task found the effect size of the correlation was small (rho = 0.082, p = 0.453, N = 85, and R^2 = 0.0067; Cohen (1992): R^2 = 0.01 is a small effect), meaning the correlation coefficient was not highly reliable, and the importance of this relationship was small.

6.7.2 Individual verbs: *drive* (AJIT and written task)

Table 6.26 Correlation between the possibility of anaphoric object drop in the AJIT and the impossibility of a null arbitrary cognate object in the written task (the verb *drive*)

Individual verb: *drive*			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (written task)
Spear man's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	0.206
		Sig. (2-tailed)	.	0.059
		N	85	85
	The impossibility of a null arbitrary cognate object (written task)	Correlation Coefficient	0.206	1.000
		Sig. (2-tailed)	0.059	.
		N	85	85

The output in table 6.26 indicates that the correlation coefficient (rho = 0.206, p = 0.059) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the written task found the effect size of the correlation was small (rho = 0.206, p = 0.059, N = 85, and R^2 = 0.0424), meaning the correlation coefficient was not highly reliable, and the importance of this relationship was small.

6.7.3 Individual verbs: *drink* (AJIT and written task)

Table 6.27 Correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (the verb *drink*)

Individual verb: *drink*			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (written task)
Spearman's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	0.099
		Sig. (2-tailed)	.	0.367
		N	85	85
	The impossibility of a null arbitrary cognate object (written task)	Correlation Coefficient	0.099	1.000
		Sig. (2-tailed)	0.367	.
		N	85	85

The output in table 6.27 indicates that the correlation coefficient (rho = 0.099, p = 0.367) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the written task found the effect size of the correlation was small (rho = 0.099, p = 0.367, N = 85, and R^2 = 0.0098), meaning the correlation coefficient was not highly reliable, and the importance of this relationship was small. I also note that, unlike in the oral task, here the correlation was clearly non-significant, giving further strength to the earlier rejection of the significance found on *drink* in just the oral task.

6.7.4 Individual verbs: *iron* (AJIT and written task)

Table 6.28 Correlation between the possibility of anaphoric object drop and the

impossibility of a null arbitrary cognate object (the verb *iron*)

Individual verb: *iron*			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (written task)
Spear man's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	- 0.079
		Sig. (2-tailed)	.	0.471
		N	85	85
	The impossibility of a null arbitrary cognate object (written task)	Correlation Coefficient	- 0.079	1.000
		Sig. (2-tailed)	0.471	.
		N	85	85

The output in table 6.28 indicates that the correlation coefficient (rho = - 0.079, p = 0.471) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the written task found the effect size of the correlation was small (rho = - 0.079, p = 0.471, N = 85, and R^2 = 0.00624), meaning the correlation coefficient was not highly reliable, and the importance of this relationship was small.

6.7.5 Individual verbs: *read* (AJIT and written task)

Table 6.29 Correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object (the verb *read*)

Individual verb: read			The possibility of anaphoric object drop (AJIT)	The impossibility of a null arbitrary cognate object (written task)
Spearman's rho	The possibility of anaphoric object drop (AJIT)	Correlation Coefficient	1.000	- 0.004
		Sig. (2-tailed)	.	0.970
		N	85	85
	The impossibility of a null arbitrary cognate object (written task)	Correlation Coefficient	- 0.004	1.000
		Sig. (2-tailed)	0.970	.
		N	85	85

The output in table 6.29 indicates that the correlation coefficient (rho = - 0.004, p = 0.970) between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the written task found the effect size of the correlation is small (rho = - 0.004, p = 0.970, N = 85, and R^2 = 0.000016), meaning the correlation coefficient is not highly reliable, and the importance of this relationship is small.

6.7.6 Summary: AJIT and written task – No statistically significant correlation between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object

In the same vein as the oral task, each correlation coefficient between (i) the possibility of anaphoric object drop in the AJIT and (ii) the impossibility of a null arbitrary cognate object in the written task with respect to each of five target verbs found the effect size of the correlation was small. That is, the correlation coefficient was not highly reliable, and the importance of this relationship was small. Briefly put, the results of this study consistently indicate that there was no statistically significant correlation found between

the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object**.**

6.8 Summary of main findings

As mentioned in chapter 5, I have devised three research tasks, namely an oral task, a written task and an AJIT to address three research questions: (1) to what extent can Chinese acquire null arbitrary cognate objects, (2) to what extent do Chinese accept anaphoric object drop and (3) do Chinese accept anaphoric object drop or a null arbitrary cognate object, but not both (i.e. no-ambiguity of null arguments)? This section summaries the key outcomes from the detailed analyses presented earlier relating across those three research tasks. Firstly, three Chinese sub-groups were aggregated into one group for analysis in this study because of (i) no statistically significant differences in the use of null arbitrary cognate objects in the oral and written tasks between each of the three sub-groups, and (ii) no statistically significant correlation between the use of null arbitrary cognate objects and the corresponding English test scores. As for the entire Chinese group, Mann-Whitney Test results reveal that there were statistically significant differences in the use of null arbitrary cognate objects in non-anaphoric contexts in both oral and written tasks between Chinese and the controls (both p = 0.000). The controls obtained all 100% accuracy and a mean of 95.15% accuracy in the use of null arbitrary cognate objects in the oral and written tasks. Chinese (N=85) obtained a mean of 81.961% accuracy in the use of null arbitrary cognate objects in the oral task whereas they obtained a mean of 79.765% accuracy in the written task. Specifically, 69.41% and 75.29% of the 85 Chinese participants achieved the above mentioned mean percentage accuracy in the oral and written tasks. More than a half (i.e. 43 out of 85 Chinese) obtained 100% accuracy in the use of null arbitrary cognate objects in the oral task. With regard to five individual target verbs, Chinese achieved mean percentage accuracy ranging from 72.55% to 92.16% in the use

of null arbitrary cognate objects in the oral task; they also achieved mean percentage accuracy ranging from 73.73% to 90.98% in the written task. There was a strong and positive relationship (correlation coefficient: 0.494; p = 0.000) between the use of null arbitrary cognate objects in non-anaphoric contexts across two tasks. There was no self-correction when using a null arbitrary cognate object in non-anaphoric contexts in the oral task (0 out of 1,045 tokens); however there were 2.2% self-corrections[24] from using a null arbitrary cognate object to producing an overt object (5 out of 230 tokens).

As for the possibility and the impossibility of anaphoric object drop in English with respect to five individual verbs in the AJIT, there were statistically significant differences in this regard between Chinese and the controls (both p = 0.000). The results show that Chinese accepted anaphoric object drop in English at a rate of 16.56% (i.e. the impossibility of anaphoric object drop at a rate of 83.44%). With respect to each target verb, the possibility of anaphoric object drop ranged from a rate of 10.12% to 21.65%. The results also show that there was a positive and strong correlation between the possibility of anaphoric specific and non-specific object drop (R^2 = 0.454; p = 0.000). In other words, Chinese accepted anaphoric specific object drop (18.04%) and anaphoric non-specific object drop (15.02%) out of its respective types of anaphoric object drop.

Finally, the correlation coefficient between the possibility of anaphoric object drop in the AJIT and the impossibility of a null arbitrary cognate object in the oral/written task found the effect size of the correlation was small. That is, the correlation coefficient was not highly reliable, and the importance of this relationship was small. The findings also reveal that, with respect to the same target verb, 61 out of 425 cases (i.e. 14.35%) of Chinese individuals accepted both anaphoric object drop at a rate of 40% to 100% and null arbitrary cognate objects at a rate of 100%. In addition, 11

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[24] The 2.2 percentage of self-corrections could be argued to be small, but what self-corrections may suggest about L2 acquisition of null arbitrary cognate objects is still worth noting (see section 7.1.3 for more details).

out of 110 cases (i.e. 10.00%) of native English speakers accepted both anaphoric object drop at a rate of 20% and null arbitrary cognate objects at a rate of 100%. To sum up, there was no statistically significant correlation found in the results that support the hypothesis of no-ambiguity of null arguments (i.e. no connection between the possibility of anaphoric object drop and the impossibility of a null arbitrary cognate object). Some Chinese and native English speakers accepted anaphoric object drop and a null arbitrary cognate object in this study. The following chapter 7 will discuss these findings in relation to the theories and hypotheses assumed in this study.

Chapter 7. Data analysis and discussion

The purpose of this study was two-fold: (i) to investigate whether Chinese can or cannot acquire the Null ACO rule for L2 and (ii) to test a hypothesis of no-ambiguity of null arguments (i.e. allowing anaphoric object drop or a null arbitrary cognate object, but not both). To achieve the above, I formulated three research questions in section 5.1. In this chapter, data analysis and discussion will be presented with reference to (7.1) acquiring null arbitrary cognate objects in non-anaphoric contexts, (7.2) investigating anaphoric object drop (specific and non-specific), (7.3) testing a hypothesis of no-ambiguity of null arguments and (7.4) summarizing the main discussion points. Prior to discussing reported findings, I point out that three Chinese sub-groups (high-beginner, low-intermediate and advanced) were aggregated into one group for analysis in this present study. I tested Chinese participants' English proficiency levels to investigate if there were any group differences, proficiency levels among the Chinese participants, might affect results in all research tasks in this study. However, the results in sections 6.2.2 and 6.2.3 indicate that there were (i) no statistically significant differences in the use of null arbitrary cognate objects in the oral/written task between the three sub-groups and (ii) no statistically important relationship between English proficiency levels of each sub-group and the percentage accuracy of using null arbitrary cognate objects in the oral/written task.[25] Therefore the Chinese learner groups were analysed as one aggregated group.

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[25] In this study, there was the lack of longitudinal data for individual participants and there was only one group of Chinese participants mixing with different English levels. Towell and Hawkins (1994: 132) point out that the analysis of staged development "involves providing an explanation for the routes which L2 learners take in moving, over time, from no knowledge of the L2 to the eventual mental representations that they construct". Due to insufficient information, it was not clear in this study whether there was any development in L2 learners' acquisition of null arbitrary cognate objects and overt anaphoric objects in English and it would be worth pursuing this specifically in future study.

7.1 Acquisition of null arbitrary cognate objects

Firstly, this study tackled the puzzling question whether Chinese L2 learners of English can acquire the use of null arbitrary cognate objects such as in *I read every night*. In section 3.4.4, I pointed out that an arbitrary cognate object in English is 'invisible' on surface structure in syntax, and I discussed the derivation of arbitrary cognate object drop in English, compared with the counterparts in Chinese. The challenge for SLA study is therefore to investigate whether Chinese can acquire the Null ACO rule which does not exist in their L1, and if so, how they can acquire it.

7.1.1 Hypotheses 1a and 1b

To recap, I assumed in section 3.4.4 that all null arguments in Chinese and English have the same featural composition: [uD, N]. They have an unvalued D-feature which needs to be assigned a value in the course of the derivation. One way that [uD] can receive a value is by a rule which interprets the null argument as an arbitrary cognate object. The rule proposed in section 3.4.4 is repeated as follows: Instead of a full DP object, a verb, for example *read*, can have an object which is a minimal nominal argument, consisting of just the features [uD, N]. This object is assigned the interpretation of an existentially bound variable restricted by the meaning of the verb, as in (3.44a), where the V' has the structure in (3.44b), and where the object has the reading shown.

(3.44a)　　I read every night.

(3.44b)

```
            V'
           / \
          /   \
         /     \
        V     [uD, N]
       read   some x (x is readable)
```
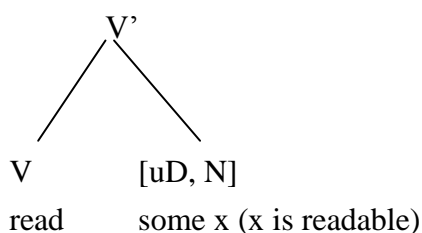
Hence, (3.44a) means 'I read some written materials every night'. Unlike the situation in English, the object cannot be spelled out as null in Chinese. Instead, Chinese has a family of rules of the following format:

(3.46)   [uD, N] → *shu/ kan__*
              etc.,

i.e. [uD, N] is spelled out as *shu* 'book' in the context immediately adjacent to *kan* 'read', etc. English, on the other hand, has the Null ACO rule:

(3.47)   [uD, N] → Ø /_V(*drive, eat, iron, read,* etc.)

Summarizing, this is a case of parametric variation of having or not having a null arbitrary cognate object, now regarded as a matter of having or not having the Null ACO rule. English has it and Chinese hasn't. In this sense English has a plus value for the parameter, Chinese a minus value. Due to the contrast regarding this parameter in English and Chinese, a learnability problem concerning L2 acquisition of null arbitrary cognate objects may arise when there is underdetermination in the input. Based on the full transfer model which proposes that L1 comprises the initial state of L2 acquisition (Schwartz and Sprouse 1994, 1996; Slabakova 2000), it is assumed that Chinese would be predisposed to supply a pronounced object in non-anaphoric contexts in L2 because of L1 transfer of the minus-value of the Null ACO parameter (i.e. absence of the Null ACO rule). If, on the other hand, Chinese learners in the experimental oral and written tasks of this study produce null arbitrary cognate object in non-anaphoric contexts in L2, this means that they have acquired the Null ACO rule, i.e. they have reset the parameter to plus value. Provided we can be reasonably certain that the primary data have not included data with all the relevant verbs (this point will be discussed below in 7.1.3), this appears to demonstrate access to UG in L2 acquisition when there is learning under poverty of stimulus (White 1985; Flynn 1987; Cook 1988; White 1989; Schwartz 2004).

Turning now to explore the implications of my findings to support my hypothesis of the Null ACO rule, let me restate two hypotheses 1a and 1b in section 5.1 are repeated here.

Hypothesis 1a: Chinese can acquire the Null ACO rule which is not instantiated in L1.
Hypothesis 1b: Chinese cannot acquire the Null ACO rule

7.1.2 Hypothesis 1a holds: Cross-modal and cross-task symmetry, and 100% target-like accuracy

As explained in sections 5.7.1 and 5.7.2, I devised a battery of oral and written tasks with pre-determined testing rules tapping participants' linguistic competence on producing null arbitrary cognate objects. I now examine the results of the use of null arbitrary cognate objects in the oral and written tasks. The results indicate that there are statistically significant differences in the use of null arbitrary cognate objects in those two tasks between Chinese and the controls (both p = 0.000). In the oral task, the controls obtained 100% accuracy of using null arbitrary cognate objects whereas Chinese obtained a mean of 81.96% accuracy in this regard. With respect to individual target verbs, the percentage accuracy of using null arbitrary cognate objects by Chinese ranged from 72.55% to 92.16% (*iron*: 72.55%; *read*: 79.61%; *draw*: 81.96%; *drink*: 83.53%; *drive*: 92.16%). In other words, the percentage accuracy of using null arbitrary cognate objects across five verbs in the oral task were 72.55% and above. As for the written task, the mean percentage accuracy of using null arbitrary cognate objects was 95.15% for the controls and 79.76% for Chinese. The results reveal that the mean percentage accuracy of using null arbitrary cognate objects in the written task for Chinese ranged from 73.73% to 90.98% (*iron*: 73.73%; *read*: 76.47%; *draw*: 78.43%; *drink*: 79.22%; *drive*: 90.98%). The percentage accuracy of using null arbitrary cognate objects across five verbs in the written task were 73.73% and above, and the highest one was 90.98%.

In addition to the percentage accuracy reported as above, I further investigated the reliability of the findings between the oral and written tasks with respect to individual verbs. This aimed to find out whether Chinese can consistently use null arbitrary cognate objects across individual verbs in both tasks. The statistical results reveal that there was a significant strong and positive relationship ($R^2 = 0.244$, p = 0.000; Cohen (1992): $R^2 = 0.25$ is a large effect) on the use of null arbitrary cognate objects across tasks. This clearly reveals that in this study, Chinese can consistently use null arbitrary cognate objects across tasks. Secondly, I uncovered a consistent pattern on increasing levels of accuracy among the five target verbs across two tasks (i.e. *iron, read, draw, drink* and *drive* - from the lowest to the highest percentage). For instance, the verb *drive* carries the highest percentage accuracy of using null arbitrary cognate objects which is 92.16% and 90.98% for the oral and written tasks. The verb *iron* carries the lowest ones which are also 72.55% and 73.73% for the oral and written tasks. The coherence across five target verbs in two tasks reveals that the findings of using null arbitrary cognate objects were highly consistent. Summarizing, there were (i) a significant strong positive correlation between the oral and written tasks with respect to individual verbs and (ii) a coherent verb pattern carrying the percentage accuracy of using null arbitrary cognate objects across two tasks. Therefore, I conclude that the results reported from both tasks were strongly reliable, which I suggest presented a systematic cross-modal and cross-task symmetry in the acquisition of this phenomenon. So, at this interim stage, I argue that hypothesis 1a hold based on (i) the mean, lowest and highest percentages of successfully using null arbitrary cognate objects and (ii) the highly reliable results across verbs and tasks. Clearly, the observed facts of the acquisition of null arbitrary cognate objects in this present study refute the hypothesis 1b stating that Chinese cannot acquire null arbitrary cognate objects.

Finally, I discovered further empirical results that strongly supported the hypothesis that Chinese can acquire null arbitrary cognate objects in L2: 100%

target-like accuracy in the use of null arbitrary cognate objects without self-correction in the oral task. As explained in section 5.8, I subscribed to Brown (1973) and Hakuta (1976a)'s criterion for acquisition, 90% is the required percentage as evidence of acquisition in this study. Table 6.4 reveals that 43 out of 85 Chinese (50.59%) acquired the use of null arbitrary cognate objects across five target verbs in the oral task at a rate of 100% accuracy. Table 6.6 shows that there were no self-corrections when producing null arbitrary cognate objects (i.e. a single attempt). More precisely, each of 43 Chinese can competently use null arbitrary cognate objects in their single attempt for all 15 tokens in the oral task (100% accuracy). I strongly argue that 100% target-like accuracy with no self-correction in the oral task means that Chinese can acquire the Null ACO rule which is not present in L1 for L2.

Summary of key points supporting hypothesis 1a:

1. Forty-three out of 85 Chinese (50.59%) achieved 100% accuracy in the use of null arbitrary cognate objects without self-correction across five target verbs in the oral task. This suggests that Chinese can competently use null arbitrary cognate objects in a single attempt.

2. Chinese obtained the mean percentage accuracy of 81.96% and 79.76% in the use of null arbitrary cognate objects in the oral and written tasks.

3. A systematic cross-modal (five target verbs) and cross-task (oral and written tasks) symmetry in the acquisition of null arbitrary cognate objects. This reveals that the results reported from both oral and written tasks were strongly reliable.

4. On individual target verb level, the lowest mean percentage accuracy in the use of null arbitrary cognate objects in the oral and written tasks were 72.55% and 73.73%, and the highest ones in the oral and written tasks were 92.16% and 90.98%

The above empirical results of this study have revealed high successful percentages of acquiring null arbitrary cognate objects in both oral and written tasks. Arguably, this could be due to the task design, for instance, all target verbs in the oral task required the use of null arbitrary cognate objects and participants particularly at advance level might easily detect what was being tested. In other words, the task design could be argued to have turned participants to adopt strategies of not using any overt object. This possibility, however, seems to be remote, given the following plausible reasons.

First, the written task consisted of both distractors and target verbs. Distractors such as *buy*, *promote* and *repair* are verbs that require an overt object. The written task with distractors required participants to judge whether they needed to produce a null cognate object or an overt object. Hence, the written task design was very unlikely to influence participants to adopt the strategy of "not using any extra words". Second, the oral task was administered first in this study "to minimize the participants' awareness of the focus of the experiment" (Yuan 2001: 259). Chinese participants in this oral task were required to comply with subject-verb agreement in L2 English while reading their answers aloud to a recorder. The oral task design highly possibly made participants treat testing English pronunciation and subject-verb agreement rule as the experimental goals. More importantly, participants needed to judge whether they had to produce a null object or an overt object. Based on the above, the possibility of adopting strategies of not using any overt object in the oral task seems to be remote. It should be noted that the success in acquiring null arbitrary cognate objects was supported by the highly reliable results of both written and oral tasks (i.e. a significant strong and positive relationship).

To conclude, I confidently argue that Chinese can acquire the Null ACO rule which is not instantiated in L1, with reference to all the above empirical results. Hence, hypothesis 1a holds and the alternative hypothesis 1b does not.

7.1.3 Implications for SLA theories: (i) Access to UG and (ii) the effect of a combination of L2 input ambiguity and L1 transfer

In what follows, I propose how Chinese can acquire an arbitrary cognate object which is null in surface syntax in English. Then, I will highlight implications of the target-like acquisition of null arbitrary cognate objects for SLA theories with respect to (i) triggers from positive input and access to UG and (ii) the effect of a combination of L2 input ambiguity and L1 transfer. To recap, I assumed that Chinese and English grammars have the same [uD, N] featural component and they both have arbitrary cognate object interpretation. The only cross-linguistic difference is that English has the Null ACO rule and Chinese hasn't. To start, I assume that sufficient positive input is the trigger to success in acquiring the Null ACO rule for L2. Based on the full transfer model which proposes that L1 comprises the initial state of L2 acquisition (Schwartz and Sprouse 1994, 1996; Slabakova 2000), I assume that Chinese start out with their L1, a set of verb-specific spell-out rules. In the input they hear evidence of the Null ACO rule in L2 such as *Peter reads every night*, *I can't drive*, and their linguistic competence allows a null arbitrary cognate object in L2 to be triggered. As discussed in section 3.4.4.1, a null arbitrary cognate object in English is assigned the interpretation of an existentially bound variable restricted by the meaning of the verb, which, in the case of verbs such as *read* and *drive*, have quite narrowly circumscribed selection restrictions. I propose that given sufficient positive input and narrowly circumscribed selection restriction, Chinese can acquire the Null ACO rule for L2. They can interpret a null object following verbs like *read* and *drive* in non-anaphoric contexts as 'something readable' and 'something drivable'.

Another question that I am concerned with is whether the target-like acquisition of null arbitrary cognate objects in this study could be acquired by explicit teaching or on an item-by-item basis by observation of the L2 input, or whether it is underdetermined by the L2 input. Considering explicit teaching of object drop and null

arbitrary cognate object interpretation for Chinese learners of English, I would claim, on the basis of my knowledge of teaching materials and course curricula in Hong Kong,[26] that this is very unlikely. This claim is supported by Liu (2008), who discusses the fact that none of the fifteen major grammar books examined in his study offers a discussion of object deletion in English.[27] He proposes that English language learners should be provided with a systematic and accurate account of what English verbs allow object drop. This may indicate that explicit teaching of object drop for Chinese learners of English is lacking.

Secondly, I claim that the target-like acquisition of null arbitrary cognate objects by Chinese learners of English cannot be fully explained as a result of item-by-item learning on the basis of input. The empirical results show that 43 out of 85 Chinese acquired null arbitrary cognate objects at a rate of 100% across five target verbs (*draw*, *drink*, *drive*, *read* and *iron)*. It could be argued that Chinese can learn null arbitrary cognate objects for target verbs like *read* and *drive* due to high frequency of occurrence. However, as I will show directly, the target verb *iron* is not a high frequency verb, yet Chinese can also acquire null arbitrary cognate objects for *iron* at a rate of 100% in the oral task. My claim is that if the frequency of occurrence for a target verb is found to be low, then this implies that the target-like acquisition of null arbitrary cognate objects is underdetermined by the L2 input.

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[26] I am a co-author on English grammar books for primary students in Hong Kong; see Chiu, K. M. and Lee, C. W. (2002).

[27] In Liu's (2008) study, the fifteen major grammar books are: Baker (1995), Barry (1998), Biber, Johnsson, Leech, Conrad and Finegan (1999), Carter and McCarthy (2006), Celce-Murcia and Larsen-Freeman (1999), Chalker and Weiner (1994), Curzan and Adams (2006), Dixon (2005), Downing and Locke (2002), Halliday (1994), Huddleston and Pullum (2002), Leech and Svartvik (2002), Quirk, Greenbaum, Leech and Svartvik (1985), Parratt (2000), Wardhaugh (2003).

I have therefore investigated the frequency of occurrence for each target verb, based on British National Corpus (BNC).[28] I used preset search codes to find out the frequency of occurrence for each target verb.[29] The results show that the frequency of occurrence for each target verb is significantly different: 16,575 for *read*, 5,823 for *draw,* 4,104 for *drive*, 2,981 for *drink* and 189 for *iron*. Among 100 million word collection in BNC, the verb *read* has 16,575 occurrences and the verbs *drink* and *iron* have only 2,981 and 189 occurrences respectively. More specifically, as for the verb *iron*, I further counted the occurrences of having *iron* as an objectless verb with an arbitrary cognate object interpretation (e.g. *Do not iron*). There were only 16 out of 189 occurrences. If I assume that the frequency of occurrence obtained in the BNC holds, by and large, for the input that Chinese learning English receive,[30] then a problem arises: How would Chinese learners of English acquire a null arbitrary cognate object for the verb *iron* when the frequency of occurrence is so low? As explained in section 4.1.3, if we know that evidence of a particular grammatical feature F is exceedingly rare in the primary data, then the probability that a learner has acquired F solely on the basis of input is correspondingly low. If not just one, but a group of learners, have independently acquired F, then the probability that they have all had access to the relevant input may be so low that we can legitimately assume that F

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[28] The British National Corpus (BNC) (1980s – 1993) is a 100 million word collection of samples of written and spoken language from a wide range of sources. http://corpus.byu.edu/bnc/.

[29] A preset search code used in British National Corpus: e.g. *iron.[v*]* means that *iron* = an exact word that I search for; *[v*]. =* only as a verb (e.g. '*…Do not iron*'.)

[30] In line with BNC, consistent findings about word frequency for five target verbs (*draw*, *drink*, *drive*, *iron* and *read*) were found from 'The Longman communication 3000'. It is a list of the 3,000 most frequent words in both spoken and written English, based on statistical analysis of the 390 million words contained in the Longman Corpus Network – a group of corpuses or databases of authentic English language.

draw, drive, read (verb) – top 1,000 frequent words in spoken and written English

drink (verb) – top 1,000 frequent words in spoken English and top 1,000-2,000 in written English

iron (verb) – top 2,000-3,000 frequent words in only spoken English

is not acquired solely on the basis of input, and therefore that F is argued to be acquired on the basis of UG. In this case, I claim the native-like behaviour of null arbitrary cognate objects is acquired, and this seems to demonstrate access to UG in L2 when it is underdetermined by the L2 input (i.e. the poverty of stimulus).

In relation to UG access in L2, my analysis above fulfills the two conditions stated by White (2003: 23) and repeated in section 4.1.3, arguing convincingly that the acquisition of null arbitrary cognate objects is constrained by UG. I repeat the main point of those two conditions here: (4.1) The phenomenon being investigated must be underdetermined by the L2 input and (4.2) the phenomenon should work differently in the L1 and the L2. It must be underdetermined by the L1 grammar. In the case at hand, the target-like acquisition of null arbitrary cognate objects could not be acquired by observation of the L2 input because (a) explicit instruction of null arbitrary cognate objects is rare or non-existent, and (b) some of the target verbs, in particular *iron* has a very low frequency of occurrence. Hence, White's condition (4.1) holds. Condition (4.2) also holds because L2 English has the Null ACO rule and L1 Chinese has not. The above suggests that Chinese learners have recourse to properties that are not instantiated in the L1 and their learning is under poverty of stimulus, i.e. they have access to UG. This makes it possible to acquire the Null-ACO rule on the basis of the input (most probably from high-frequency verbs like *read*) and generalize it to all verbs in the same category. This is based on some unconscious knowledge that they are verbs of the same relevant class and this knowledge comes from UG. In this sense, they reset the parameter from not having to having null arbitrary cognate objects, from –Null ACO to +Null ACO for all target verbs in L2.[31]

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[31] Croft, W. and Cruse, D. A. (2004) point out that many cognitive linguists purpose a usage-based model for language acquisition (see Barlow and Kemmer 2000; Bybee and Hopper 2001). They (ibid: 292) state that "the usage-based model contrasts with the traditional generative model of grammatical representation"; "in the structuralist and generative model, only the structure of the grammatical forms determines their representation in a speaker's mind" and "in the usage-based model, properties of the

Another important point to note is that I am not claiming that frequency effect does nothing in the L2 acquisition. In this study, the frequency effect in the usage-based approach cannot fully explain the success in acquiring null arbitrary cognate objects in this study. The frequency-based interpretation is inadequate as a unified account for the findings of this study. As White (2003: 41) states, "It is important to understand that the UG approach does not deny the importance of input. But the claim is that input alone is not enough." To conclude, I would also concur with Hawkins (2003: 613) and Rothman and VanPatten (2013: 251) that it is plausible that input frequency and UG play a role in shaping L2 learners' acquisition.

In Chapter 4 I reviewed some theories of L2 acquisition. As for full access, Schwartz and Sprouse's (1994, 1996) propose that L2 learners have recourse to all aspects of UG available to L1 learners, and can make use of them to reset any parameters in L2. As for partial access, Smith and Tsimpli (1995) focus on the parameterization of functional categories and they claim that L2 learners cannot acquire new functional categories or features after the end of a critical period. Hawkins and Chan (1997) and Hawkins (2003, 2005) propose that L2 learners can acquire interpretable syntactic features; however, uninterpretable syntactic features still remain problematic for L2 learners. Taking the difference between the Chinese and the English system as regards arbitrary cognate objects to be a matter of parameter setting: +Null ACO in English vs. −Null ACO in Chinese, my findings in this study show that this

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use of utterances in communication also determine the representation of grammatical units in a speaker's mind." Ellis (2002: 144) says that "In these usage-based perspectives, the acquisition of grammar is the piecemeal learning of many thousands of constructions and the frequency-based abstraction of regularities within them. Language learning is the associative learning of representations that reflect the probabilities of occurrence of form-function mappings." The claim in the text is (a) that piecemeal learning of the Null ACO constructions is ruled out because of the infrequency of some of the verbs tested, and (b) that the "abstraction of regularities" required in the present case (and more generally) requires access to UG, that is the unconscious knowledge of linguistic features, categories, and principles which is not based on experience.

parameter can be reset. A significant minority of the Chinese learners appear to have attained a native-like level of accuracy. I have also shown that this requires access to UG when there is learning under poverty of stimulus. However, the parameter resetting does not involve adding any new functional categories or features, interpretable or uninterpretable. All it involves is acquisition of a new spell-out rule, the Null ACO rule, which is generalized to all verbs of the relevant category. My findings, therefore, support theories which claim that L2 acquisition presupposes access to UG, but do not have any clear implications for the issue of partial access vs. full access debated in the literature.

I now turn to discuss the effect of a combination of L2 input ambiguity and L1 transfer. Despite the specific rule of minimizing the number of words, the results reveal that some Chinese still produced a pronounced object such as *David and his brother read books/newspapers every night*. I argue Chinese cannot find a clear rule when determining what English verbs that need a pronounced object or allow a null object (see Yip and Matthews (2007) on L2 input ambiguity, and below). Chinese have inputs of two types of verbs in L2: (i) transitive verbs (e.g. *repair*) that obligatorily need a pronounced object such as in *I repair *(DP) every weekend* and (ii) transitive verbs (e.g. *read)* that optionally take a pronounced or a null object such as in *I read (books/newspapers) every weekend*. For the latter verbs the input is ambiguous. There is evidence, presumably, quite frequent, that they require an overt object. Based on the full transfer model which proposes that L1 comprises the initial state of L2 acquisition (Schwartz and Sprouse 1994, 1996; Slabakova 2000), I also propose that L1 transfer of the minus-value of the Null ACO parameter (i.e. absence of the Null ACO rule in Chinese, see section 3.4.4.1) plays a role in the use of a pronounced object. As discussed in section 3.4.4.1, English has a plus value for the Null ACO parameter, Chinese a minus value. Assuming that Chinese have transfer of the minus-value of the Null ACO parameter from L1 to L2, they would treat L2 as their L1, not having null arbitrary

cognate objects. Hence, they would produce a pronounced object in L2. If my analysis above is on the right track, there are two factors, which are compatible with each other, namely (i) L2 input ambiguity and (ii) L1 transfer, driving Chinese learners of English to using a pronounced object in non-anaphoric contexts in L2. That is to say, both factors convey the same message to Chinese that they have to produce a pronounced object in L2 in non-anaphoric contexts.

My claim here is supported by Yip and Matthew (2007) who have argued that the input ambiguity causes problems for Chinese learners of English when unlearning anaphoric object drop. They point out that the input ambiguity of 'optionally transitive' verbs such as *eat, read* is also compatible with a Chinese-based analysis, in which the missing object is syntactically present, coreferential with a null topic. In a similar vein, I argue that L1 transfer of the minus-value of the Null ACO parameter is compatible with L2 input of transitive verbs because both factors point in the same direction of having a pronounced object in L2. This appears to be supported by evidence of self-corrections from producing a null object to using a pronounced object in the oral task in this study. As shown in table 5, there was 2.2% self-correction (5 out of 230 tokens) from using a null arbitrary cognate object (e.g. *The dancer seldom draws; My grandma never drives*) to producing an overt object (e.g. *The dancer seldom draws pictures; My grandma never drives car*[32]). The 2.2 % could be argued to be small, but what self-corrections may suggest about L2 acquisition of null arbitrary cognate objects is worth noting. As Tarone (2013: 362) points out, "it should not be possible for theorists to just ignore data that is inconvenient to their theory, or to dismiss it because it is "just one case". In addition, as I point out in section 5.8, Zyzik (2008: 91) reports that "self-corrections began with a null object, which was later remedied by means of an overt object". She (ibid: 99) further says that "I interpret these examples of repairs as attempts to fill the missing object slot,

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[32] The example *My grandma never drives car* was produced by one Chinese participant; the DP *car* lacks an article and that utterance is ungrammatical.

which suggests that learners, when monitoring their speech, rejected their initial production of null objects". In this study, I concur with Zyzik's (2008) explanation: Chinese learners in my study also monitored their speech and rejected their initial oral production of null objects, in some cases. The feature of self-correction from using a null object to producing a pronounced object probably suggests that some Chinese in this study still monitored their speech, possibly demonstrating the effect of a combination of L2 input ambiguity and L1 transfer.

Summarizing, the empirical results of this study support hypothesis 1a that Chinese can acquire the Null ACO rule which is not instantiated in L1, and this seems to demonstrate access to UG in L2 when there is learning under poverty of stimulus. The results of self-corrections and producing pronounced objects in non-anaphoric contexts in L2 in this study suggest the effect of a combination of L2 input ambiguity and L1 transfer.

7.2 Investigating anaphoric object drop

The second purpose of this study is to test hypothesis 2a of no-ambiguity of null arguments (i.e. allowing anaphoric object drop or a null arbitrary cognate object, but not both). The results of the use of null arbitrary cognate objects were discussed in section 7.1. Before examining the connection between a null arbitrary cognate object and anaphoric object drop, I now investigate anaphoric object drop in this section. [33] I firstly recap an exemplar to illustrate how Chinese accept anaphoric object drop, as discussed in section 5.7.3. For instance, in *Susan irons Paul's shirts before he goes to work. Paul doesn't iron* [*e*] *at weekends*, if Chinese link the object gap [*e*] to an antecedent, interpreting the second sentence as *Paul doesn't iron his shirts at weekends*

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[33] I would like to thank the audience at the 45th Annual Meeting of the British Association for Applied Linguistics (BAAL 2012), University of Southampton, England, UK on 6 September, where an earlier version of this section of my thesis was presented.

as licensed by their L1 Chinese, rather than *Paul doesn't iron anything at weekends* then I called this allowing or accepting anaphoric object drop in English (see section 5.8). It should be noted that previous SLA studies (Yuan 1997; Jiang 2009) have discussed unlearning anaphoric specific object drop in English by Chinese, but mainly with respect to target verbs that cannot allow a null arbitrary cognate object (e.g. *buy, repair*) as in *Mary's bike was broken. I am going to repair *(it) for her*. They found that Chinese even at an advanced level of English proficiency have difficulty unlearning anaphoric specific object drop, as reviewed in section 4.3.2. As far as I know, there are no SLA studies investigating to what extent Chinese accept anaphoric object drop in the case of target verbs that allow a null arbitrary cognate object, so it is still unknown whether Chinese also accept anaphoric specific and non-specific object drop in this context. Hence this AJIT set out to uncover this issue relating to the interpretation of an object gap. In addition, I further investigated what type(s) of anaphoric object drop in L2, specific and non-specific, that Chinese have more difficulty unlearning. In other words, does the definiteness of the antecedent play a role for anaphoric object drop? If it does, what accounts for this effect?

7.2.1 Anaphoric object drop (specific and non-specific) and the trigger

As shown in table 6.12, Chinese obtained a mean of 16.56% in allowing anaphoric object drop, compared with the controls of 3.45%. Across five target verbs, the percentages of anaphoric object drop in this task were: *iron*: 15.29%; *read*: 19.29%; *draw*: 16.47%; *drink*: 10.12%; *drive*: 21.65%. When comparing to the controls, the results indicate that Chinese achieved a higher percentage of anaphoric object drop, and those differences between Chinese and the controls ranged from 8.3% to 16.47% with respect to five target verbs. Though those differences may not be huge in number, there

were statistically significant differences in this regard between Chinese and the controls (p = 0.000), as reported in section 6.5.1. Most importantly, this difference raises an issue related to different interpretations of an object gap between interlocutors. I illustrate this as follows. For instance, in *Susan irons Paul's shirts before he goes to work. Paul doesn't iron [e] at weekends*, the difference in interpretations of the object gap [*e*] could be that one may interpret [*e*] as 'anything ironable' while the other may interpret it as 'Paul's shirts'. Though 'Paul's shirt' is a sub-set of 'anything that can be ironable', I argue that without tapping one's interpretation of a null object [e] as above, we would not realize there may be a subtle difference in interpreting a null object.

In what follows, I investigate what type(s) of anaphoric object drop, specific and non-specific, that Chinese would have difficulty unlearning. Anaphoric object drop in English by Chinese has been argued to be due to L1 transfer (see Yuan 1997; Jiang 2009). However, the anaphoric object drop in those studies is specific, that is with a definite antecedent. There is no SLA study investigating anaphoric object drop in English when there is a definite or indefinite antecedent which may lead to an anaphoric specific and non-specific object drop. In this AJIT, 12 out of 25 test items had a definite antecedent like *Paul's shirts* as in *Susan irons Paul's shirts before he goes to work. Paul doesn't iron at weekends*. Another 13 test items had an indefinite antecedent like *comic books* as in *Grandad likes reading comic books in public libraries. He doesn't read at home*. Those test items aimed to elicit the results of allowing anaphoric specific and non-specific object drop. As reported in section 6.5.4, there are 18.04% (184 out of 1,020 tokens) anaphoric specific object drop and 15.20% (168 out of 1,105 tokens) anaphoric non-specific object drop in the AJIT. The percentage of anaphoric object drop may be argued to be low in general terms, but the research focus is what type(s) of anaphoric object drop, specific and non-specific, that Chinese would have difficulty unlearning. Hence, I turn to the correlation between allowing those two types of anaphoric object drop with reference to Chinese. The statistical results in table 6.16 reveal that there was a

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strong and positive correlation in this regard ($R^2 = 0.454$; $p = 0.000$, where $R^2 = 0.25$ or above is defined as a large effect, Cohen 1992). This means that the Chinese responses show a positive and strong correlation between allowing anaphoric specific and non-specific object drop. I conclude from these results that the trigger for both anaphoric specific and non-specific object drop in L2 is the existence of an antecedent, definite or indefinite. As discussed in section 3.4.3, Chinese allows both non-specific and specific object drop because the null object argument [uD, N] in Chinese can be valued from an antecedent, with a referential index (definite antecedent) or a referential variable (indefinite antecedent). A specific interpretation is the result when [uD] is valued by a definite antecedent, whereas a non-specific interpretation is the result when it is valued by an indefinite antecedent in general. In both cases, the N of null [uD, N] is recovered by virtue of the overt noun of the antecedent. This is interesting from the point of view of syntactic analysis and parameter-setting. If unlearning object drop for Chinese learners of English is a matter of unlearning topic drop, or 'resetting a null topic parameter', there is no particular reason to expect a high correlation between definite and   indefinite object drop, as the latter does not involve topicalisation (see Chapter 3). On the other hand, it is not the case that Chinese allows null objects in any contexts; in particular, it does not allow null cognate objects. So the crucial distinction seems to be between anaphoric and non-anaphoric object drop.

Summarizing, the results indicate that Chinese do not readily allow anaphoric object drop for the verbs that allow a null arbitrary cognate object, but the correlation between allowing anaphoric specific and non-specific object drop is strong and positive, and the trigger is argued to be the existence of an antecedent. In what follows, I test the hypothesis of no-ambiguity of null arguments, using the results of allowing anaphoric object drop in this section and the results of disallowing null arbitrary cognate objects.

7.3 Testing the hypothesis of no-ambiguity of null arguments

Using correlation between allowing anaphoric object drop in the AJIT in section 7.2 and

disallowing a null arbitrary cognate object in the oral/written task in section 7.1 with

respect to same target verbs and same individuals, I test the hypothesis of no-ambiguity

of null arguments in this section.

7.3.1 Hypotheses 2a and 2b

To recap, as shown in section 3.4.4.2, Cheng and Sybesma (1998: 87) explicitly states

the generalization "if a language has object pro it does not have empty objects which are

not referential". They do not discuss how such a negative correlation would work,

formally. For the sake of argument I have postulated hypothesis of the no-ambiguity of

null arguments in section 3.5, as repeated here.

(3.48) No ambiguity of null arguments: A null argument can only have one

interpretation.

The null arguments I have discussed until now are nominals with minimal feature

content: [uD, N]. Thus an alternative formulation of (3.48), in the present framework,

could be (3.49):

(3.49)   [uD, N] can only have one interpretation.

Then languages differ with regard to the interpretation that [uD, N] can have, as

follows:

English, French, Swedish, etc.: [uD, N] → arbitrary cognate object

Chinese, Thai, Mundang, etc.: [uD, N] → null topic

Non-specific object drop, as discussed in section 3.4.3.1, would not be instances of [uD,

N], but of [D_i, N], where D is specified/valued, having its own referential index, but is

a null D in Chinese. Only the noun is anaphoric, being interpreted by recourse to an antecedent.

The alternative hypothesis is that some degree of ambiguity would be tolerated in this case of null arguments, as in a number of other cases in the grammar. In that case, we just postulate that Chinese lacks the null arbitrary cognate object. Instead, it has a set of spell-out rules for arbitrary cognate objects, different for each verb. It also has an aboutness topic feature in C, which English does not have, which triggers movement of objects to spec, CP, including null objects, where they can be linked to an antecedent in the context (see section 3.4.2.1). Furthermore, Chinese has null articles, while English has spelled-out articles, with the effect that NP-ellipsis results in a null argument in Chinese, but in a stranded article in English (see section 3.4.3.1). The co-occurrence of these properties would be just a matter of historical accident. This has implications for what combinations of properties we expect to find among the languages of the world, and, assuming that the interlanguage of language learners is constrained by UG (e.g. White 1989: 22; Yip 1995: 23), what combinations of properties we expect to find in the interlanguage of Chinese learners of English.

The two hypotheses relating to no-ambiguity of null arguments stated in section 5.1 are repeated as follows.

Hypothesis 2a: there is no ambiguity of null arguments.

Hypothesis 2b: some degree of ambiguity of null arguments can be tolerated.

7.3.2 Hypothesis 2b holds: Allowing anaphoric object drop and a null arbitrary cognate object

Before carrying out statistical correlations for testing hypotheses 2a and 2b, I discovered some Chinese who accepted both anaphoric object drop and null arbitrary cognate objects. The finding suggests that some degree of ambiguity of null arguments can be tolerated. First, there were 85 Chinese participants in this study and each was given five target verbs (i.e. altogether 425 individual cases). With respect to each target verb, I

aimed to analyse cases of individual Chinese who accepted anaphoric object drop in the AJIT at a rate of 0% to 100% and also produced null arbitrary cognate objects in the oral task at a rate of 100%. Hypothesis 2a of no-ambiguity of null arguments predicts that there is complementary distribution of anaphoric object drop and a null arbitrary cognate object, so an individual was expected not to accept anaphoric object drop when he or she produced a null arbitrary cognate object at a rate of 100% with respect to a target verb. Hence, I focused on cases having a null arbitrary cognate object at a rate of 100% and anaphoric object drop at a rate of 40% to 100%. Table 6.13 shows 14.35% cases of individual Chinese (i.e. 61 out of 425 cases) accepted those two types of object drop with respect to a same target verb. Moreover, 5.88% cases of individual Chinese (i.e. 25 out of 425 cases) accepted both anaphoric object drop at a rate of 60% to 100% and null arbitrary cognate objects at a rate of 100%. This seems to reveal that some degree of ambiguity of null arguments was tolerated by Chinese, interpreting a null argument as either anaphoric object drop or a null arbitrary cognate object in their interlanguage grammar.

In addition to the above empirical results showing tolerance of some degree of ambiguity of null arguments, I further investigated the statistical correlation between (i) allowing anaphoric object drop and (ii) disallowing a null arbitrary cognate object in the oral/written task. First, in sections 6.2 and 6.5, we found that Chinese acquired the use of null arbitrary cognate objects at a mean of 81.916% accuracy in the oral task, and they accepted anaphoric object drop at a mean of 16.56% accuracy in the AJIT. On surface, it seems that the majority of the participants behaved as predicted by Cheng and Sybesma's generalization. This appears that there is a connection between allowing a null arbitrary cognate object and disallowing anaphoric object drop. However, I have to point out that a correlation between the results of those two tasks cannot be revealed by two means of percentage accuracy among 85 Chinese. Instead, a connection between two tasks can only be revealed by the correlation between data values of individuals in

two tasks (i.e. to what extent do values in one variable correspond to values in another variable). According to Larson-Hall (2012: 148), correlation is "a statistical test that involves two variables which are both continuous". Therefore, the evidence to support Cheng and Sybesma's generalization was the existence of any statistically significant correlation between allowing anaphoric object drop in the AJIT and allowing a null arbitrary cognate object in the oral/written task. I put the hypothesis 2a of no-ambiguity of null arguments to the test and focused on the results of correlation found in the AJIT and the oral task. The results in section 6.6.3 indicate that each correlation coefficient between those two tasks showed the effect size of the correlation to be small with respect to individual target verbs. There was no statistically significant correlation, so we cannot infer any relationship between the two types of object drop. In other words, there was no complementary distribution of anaphoric object drop and a null arbitrary cognate object. In addition to the oral task, I also examined the correlation in this regard but in the written task. In line with the previous results, each correlation coefficient in this regard between the AJIT and written task showed that the effect size of the correlation is small with respective to each target verb. Again, the statistical results in section 6.7 show that we cannot infer any relationship between anaphoric object drop and a null arbitrary cognate object in the written task, in line with correlation results found in the oral task.

Another part of testing the hypothesis of no-ambiguity of null arguments is to investigate native English speakers, the controls, in this study. The results reported in table 6.18 also show that some native English speakers accepted anaphoric object drop and null arbitrary cognate objects. In other words, they also tolerated ambiguity of null arguments. With respect to a same target verb, 12.73% of the control cases (i.e. 14 out of 110 cases) accepted both anaphoric object drop at a rate of 20% to 60% and a null arbitrary cognate object at a rate of 100%. The observed facts from this empirical study also reveal that anaphoric object drop and a null arbitrary cognate object were accepted

for the same target verb in L1 English. These results show that some degree of ambiguity of null arguments is tolerated also in L1 English.

Summarizing, we can observe (i) that null arbitrary cognate objects and anaphoric object drop are allowed with respect to individual verbs among some Chinese and native English speakers and (ii) that no statistically significant correlation holds between anaphoric object drop and a null arbitrary cognate object among Chinese learners of English, I conclude from this that a null argument can have more than one interpretation in a language, in the strict sense of 'I-language', that is a person's internal linguistic system (Chomsky 1995: 15-17) so there is no necessary complementary distribution of a null arbitrary cognate object and anaphoric object drop. The language (i.e. I-language) in this case is the interlanguage of (some) Chinese learners of English, but also, interestingly, the I-language of some of the native English controls. Hence, hypothesis 2a is wrong, and the alternative hypothesis 2b holds.

7.3.3 Implications for (i) learning and unlearning object drop, (ii) languages allowing ambiguity of null arguments and (iii) anaphoric object drop in L1 and L2 English

In section 3.4.4.2, I have mentioned that Cheng and Sybesma (1998: 87) explicitly states the generalization "if a language has object pro it does not have empty objects which are not referential". If their generalization is right, we should find complementary distribution of allowing anaphoric object drop and disallowing non-anaphoric object drop. However, the findings of this empirical study reveal that a null argument can have more than one interpretation in an I-language, and that there is no necessary complementary distribution of anaphoric object drop and a null arbitrary cognate object. The first implication is that the learnability tasks in learning null arbitrary cognate objects and unlearning anaphoric object drop facing learners would not be formally associated because we found no connection between the success in learning

null arbitrary cognate objects and unlearning anaphoric object drop. In other words, there is no prediction that we can make regarding unlearning anaphoric object drop when there is success in learning null arbitrary cognate objects, or vice versa.

Secondly, since the hypothesis of no-ambiguity of null arguments is wrong, it is predicted that we can find some languages, now in the sense of community languages, with a null argument that can have more than one interpretation. In chapter 1, I mentioned that Malayalam[34] has both anaphoric object drop and a null arbitrary cognate object. The following are two examples showing anaphoric object drop and a null arbitrary cognate object. In (7.1), the object is dropped in the answer, and refers to *rotti* 'the bread'.

(7.1) rotti   ewite?   kutti   tinnu   (Malayalam)
       bread-n   where   child-n   ate
       'Where's the bread? The child ate (it).'   Mohanan (1983: 663)

Example (7.2) shows a null arbitrary cognate object.

(7.2) njaan   waayik'k'-uka aaNə   (Malayalam)
       I read-INF   be.PRES
       'I am reading.'   Jayaseelan (p.c.)

These examples indicate that a null argument in Malayalam can be a case of anaphoric object drop or it can be a null arbitrary cognate object; some degree of ambiguity of null arguments can be tolerated in Malayalam. Assuming hypothesis 2b is right, there will be more languages that have a null argument which can have more than one interpretation. Hence, one line of future research is to further investigate what languages can allow a null argument to have more than one interpretation and what interpretations the null objects can have.[35]

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[34] Malayalam is one Dravidian language spoken in the south India and it is a discourse pro-drop language (see Mohanan 1983).

[35] It is interesting to note that that the standard verb for 'eat' in the sense of 'eat a meal' in Malayalam includes the noun root of 'rice'. It is literally 'rice-eat' (Jay Jayaseelan, p.c.; note that Malayalam is a

A further issue is what factors play a role in accounting for anaphoric object drop in L1 English. The empirical results reveal that some native English speakers also interpreted a null argument as anaphoric object drop in L1, contrary to predictions discussed in sections 3.4.2.1 and 3.4.3.1, based on the standard view that English does not have anaphoric object drop. I postulated, basically following Huang (1984),that Chinese has an aboutness topic feature in C, which English does not have, which triggers movement of objects to spec, CP, including null objects, where they can be linked to an antecedent in the context. Furthermore, Chinese has null articles, while English has spelled-out articles, with the effect that NP-ellipsis results in a null argument in Chinese, but in a stranded article in English. Hence, English does not allow anaphoric object drop whereas Chinese does. However, the findings reveal that some Chinese and native English speakers allowed anaphoric object drop in English. Previously, numerous SLA studies (Yuan 1997; Jiang 2009) suggest that there is L1 transfer of topic drop, so Chinese may have difficulties in unlearning anaphoric object drop. Chinese is a discourse pro-drop language and some Chinese participants interpret a null argument as a null topic when there is a definite antecedent in L2 English, which I assume, following Yuan (1997) and Jiang (2009), is based on transfer of L1 discourse strategies. Interestingly, the empirical results of the present investigation reveal that some native English speakers also interpreted a null argument as a null topic which in this case cannot be due to L1 discourse strategies. This finding thus raises interesting questions: What factors play a role in accounting for anaphoric object drop in (i) L1

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verb-final language). It is not unexpected that a language which allows null arbitrary cognate objects, i.e. has the Null ACO rule, may still have some verb-specific ACO spell-out rules. Anders Holmberg (p.c.) also points out that Swedish, a language with the Null ACO rule, has an expression for driving which is *köra bil*, literally 'drive car', where the object is not a full DP, but an articleless, invariant noun. The meaning is roughly 'be in the habit of driving', or even 'have a driver's license'. There is no corresponding construction with, for example, the verb for reading. This would be another example of a language which has the Null ACO rule but also has some verb-specific ACO rules.

English and (ii) L2 English by Chinese? Is L1 transfer of anaphoric object drop the only factor accounting for anaphoric object drop in L2 English, when a null argument can also be interpreted as anaphoric object drop in L1 English? Or is this finding simply a task effect from these particular participants? Hence, another line of future research is to investigate these questions with a larger sample size in L1 English or other non-discourse pro-drop languages.

7.4 Summarizing the main discussion points

1. It is concluded that Chinese can use null arbitrary cognate objects and some are even 100% target-like, with reference to plausible results of means, lowest and highest percentage accuracy in the use of null arbitrary cognate objects across all five target verbs and in the oral and written tasks.

2. The results reveal a systematic cross-modal and cross-task symmetry in the acquisition of null arbitrary cognate objects (i.e. a significant strong positive correlation between the oral and written tasks).

3. The results of this study support hypothesis 1a that Chinese are not restricted by L1 transfer effects but can acquire the Null ACO rule which is not instantiated in L1, and this seems to demonstrate access to UG in L2 when there is learning under poverty of stimulus. It is also plausible that input frequency and UG play a role in shaping L2 learners' acquisition.

4. The results indicate that Chinese do not readily allow anaphoric object drop for the verbs that allow a null arbitrary cognate object, but the correlation between allowing anaphoric specific and non-specific object drop is strong and positive.

5. The results of this study reveal that the existence of an antecedent, definite or indefinite, is a trigger for anaphoric object drop in L2. A null object argument [uD, N] in Chinese can be valued from an antecedent, with a referential index (definite antecedent) or a referential variable (indefinite antecedent).

6. There is a subtle but statistically significant difference between Chinese and the controls in interpreting a null object, in a sentence with a possible discourse antecedent, as anaphoric object drop or a null arbitrary cognate object.

7. There is no statistically significant correlation between allowing anaphoric object drop and disallowing a null arbitrary cognate object in L2, so we cannot infer any relationship between those two types of object drop (no complementary distribution).

8. The results of this study do not support hypothesis 2a of no-ambiguity of null arguments, so Cheng and Sybesma's (1998) generalization does not hold universally. The alternative hypothesis 2b holds: a null argument [uD, N] can be interpreted as a null topic and a null arbitrary cognate object, so some degree of ambiguity of null arguments can be tolerated in a language, in the strict sense of 'I-language', that is a person's internal linguistic system (Chomsky 1995: 15-17).

Chapter 8. Conclusion

8.1 Conclusion

In this thesis, it has been shown that facts concerning anaphoric object drop and non-anaphoric arbitrary cognate object drop in Chinese and English are consistent with the syntax-driven approach, and that differences between two languages can be characterized in terms of syntactic parameters. There are two parameters where Chinese and English are different, affecting anaphoric specific and non-specific object drop: (a) having or not having an Aboutness topic feature in C, and (b) having or not having a null D. There is another case of parametric variation of having or not having a null arbitrary cognate object, now regarded as a matter of having or not having the Null ACO rule, a rule spelling out arbitrary cognate objects as null. Given the above parametric variation in Chinese and English, this study set out to investigate L2 acquisition of null arbitrary cognate objects by Chinese learners of English and, second, to put Cheng and Sybesma's (1998) generalization to the test (i.e. the hypothesis of non-ambiguity of null arguments). Using an innovative battery of AJIT judgment and production tasks in this empirical SLA study, I aimed to tap participants' linguistic competence in production and interpretation of a null object. The empirical results of this study show that Chinese could be very successful in the use of null arbitrary cognate objects in the oral task, with no effect of English proficiency. It is concluded that Chinese can acquire the Null ACO rule which is not instantiated in L1, demonstrating access to UG when there is learning under poverty of stimulus. The frequency effect in the usage-based approach cannot fully explain the success in acquiring null arbitrary cognate objects in this study. However, I conclude that it is plausible that input frequency and UG play a role in shaping L2 learners' acquisition.

In addition, I propose that the use of pronounced objects in non-anaphoric contexts in this study was due to the effect of a combination of (i) L2 input ambiguity (the relevant verbs often have an overt object) and (ii) L1 transfer of the minus-value of the Null ACO parameter. Those two compatible factors drive Chinese learners of English to the use of a pronounced object in non-anaphoric contexts, which explains why they perform with less than target-like accuracy in a significant number of cases. Another purpose of this study was to test the non-ambiguity of null arguments hypothesis. The empirical results show that Chinese do not readily allow anaphoric object drop for the verbs that allow a null arbitrary cognate object, but the correlation between allowing anaphoric specific and non-specific object drop is strong and positive. The results also indicate that a null argument can have more than one interpretation in a language, in this case the interlanguage of Chinese learners of English. It can be a null topic or an arbitrary cognate object. Some degree of ambiguity of null arguments can be tolerated. The supporting results included the lack of statistically significant correlation between acceptance of anaphoric object drop in the AJIT and the rejection of a null arbitrary cognate object in the oral/written task with respect to each of five target verbs. There is no complementary distribution, or any connection between those two types of null objects. Hence, there is no prediction that we can make regarding unlearning anaphoric object drop when there is success in learning a null arbitrary cognate object, or vice versa. The empirical results reveal that individual Chinese and native English speakers accepted both anaphoric object drop and a null arbitrary cognate object. If a null argument can have more than one interpretation in the interlanguage of Chinese learners of English, and in fact also in the language of some native English speakers (in the control group), it is predicted that we can find some other languages exhibiting this. I am aware of one language, Malayalam, which apparently allows anaphoric object drop and a null arbitrary cognate object. Hence, one line of future enquiry is to investigate what languages can allow a null argument to have more than one interpretation, and

what interpretations ambiguous null arguments can have.[36] Moreover, when the results

of this study indicate that some native English speakers also can interpret a null

argument as anaphoric object drop in L1 English, interesting questions are raised for

further investigation: What factors play a role in accounting for anaphoric object drop

in (i) L1 English and (ii) L2 English by Chinese? Is L1 transfer of anaphoric object

drop the only factor accounting for anaphoric object drop in L2 English, when a null

argument can also be interpreted as anaphoric object drop in L1 English?

8.2 Limitations and implications for future research

The limitations, as I see them with hindsight, are the sampling size, the number of

target verbs, and the design of the oral and written tasks on understanding the intended

meaning of a pronounced object. The first limitation is concerned with the sampling

size of participants, particularly the control group. In this present study, there were 85

Chinese and 22 native English speakers. One research question was to put the

hypothesis of no-ambiguity of null arguments to the test, and the findings reveal that

some native English speakers also accepted anaphoric object drop in L1 English,

contrary to the standard assumption that English does not allow anaphoric object drop.

These findings raise some interesting questions such as what factors play a role in

accounting for anaphoric object drop in (i) L1 English and (ii) L2 English by Chinese.

Hence, if the sample size of native English speakers in the future investigation is

increased, a fuller picture can be drawn regarding acceptance of anaphoric object drop

in L1 English. Another limitation was the scope of this study as I only examined five

target verbs. Further studies including other verbs such as *type* and *paint* etc. should be

conducted to corroborate the findings of the current study. The last limitation is the

design of oral and written tasks which cannot tap Chinese participants' intended

meaning of a pronounced object in the oral and written tasks. For instance, if the

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[36] See Holmberg and Roberts (2012) on ambiguity of null subjects in a cross-linguistic perspective.

Chinese produced a pronounced object in L2 such as 'Mary reads books' and if it had then been ascertained that the intended meaning of that pronounced object is 'Mary reads books or magazines' (i.e. an arbitrary cognate object interpretation), then it could be safely concluded that L1 transfer of a pronounced cognate object had occurred. Otherwise, another possible interpretation of that pronounced object could be literally 'Mary reads some books', without arbitrary cognate object interpretation. Hence, when we turn to investigating L1 transfer of cognate objects in L2 acquisition in future study, we have to devise some ways for learners to reveal their intended meaning of a pronounced object in non-anaphoric contexts in the L2.

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Appendix A. Sample oral task

Task 1: Oral Production Task

Instructions:

- Use ALL of the words given to make up one sentence. Then read it aloud to the researcher and the sound recorder placed in front of you.

- **<u>MINIMIZE THE NUMBER OF WORDS</u>** that you use in each sentence.

- You are expected to make 15 sentences in this task.

- Before you start this task, a warm-up exercise is given for you to make 2 sentences. You may ask for any necessary clarifications.

Warm-up Exercise:

> **the retired teacher /   every night /   write (verb)**

> **Peter /   cook (verb) /   seldom**

Now that the warm-up exercises have been completed, here is Task 1. Remember, 'Minimize the number of words in each sentence'!

Task 1:

> **1. David and his brother /   every night /   read (verb)**

> **2.   the retired engineer /   read (verb) /   seldom**

> **3.   Andy and Tina /   every day /   drive (verb)**

> **4.   my grandma /   drive (verb) /   never**

Task 1: To be continued (Instructions)

- Use ALL of the words given to make up one sentence.
- **MINIMIZE THE NUMBER OF WORDS** that you use in each sentence.

5. **my kids /   every Friday afternoon /   draw (verb)**

6. **the dancer /   draw (verb) /   seldom**

7. **Jason and his schoolmates / all day /   drink (verb)**

8. **the young boy /   drink (verb) /   never**

9. **my two sisters /   every weekend /   iron (verb)**

10. **the young girl /   iron (verb) /   never**

- **To be continued (Questions 10 -15) -**

Task 1: To be continued (Instructions)

- Use ALL of the words given to make up one sentence.
- **<u>MINIMIZE THE NUMBER OF WORDS</u>** that you use in each sentence.

11. **the little kid /** **every morning /** **draw (verb)**

12. **my uncle /** **every Saturday night / drink (verb)**

13. **Susan /** **all day /** **drive (verb)**

14. **my father /** **every Sunday night /** **read (verb)**

15. **my grandma /** **every day /** **iron (verb)**

- **End of Task 1 -**

Appendix B. Sample written task

Task 2: Written task - Instructions:

- Read the following 30 sentences carefully. Try to work as quickly and as accurately as you can.
- For each question:
- If you find that a sentence is **INCORRECT**, fill in the blank with appropriate words (**maximum of 3 words**).
- If you find that a sentence is **CORRECT, <u>do NOT put any words in the blank</u>**, just **<u>put a '√'.</u>**
- You are NOT expected to go back to your previous answer and make changes after you have completed it.
- Before you start this task, a warm-up exercise is given for you to make 2 sentences. You may ask for any necessary clarifications.

Warm-up Exercise:

    i. The millionaire never cooks _____ for his family.

    ii. Most of my friends borrow _____ from this local library.

Now that the warm-up exercises have been completed, here is Task 2. Remember, '**<u>if the sentence is CORRECT, just put a '√'</u>**

Task 2:

1) Most of the people who use libraries expect to find _____ in those libraries.

2) Exercise is using your body in a way that will promote _____.

3) It is getting difficult to repair _____ at the roadside with the growing complexity of car engineering.

4) A number of things might affect how we use _____ in everyday conversation.

5) A servant is given money every day to buy _____.

6) Some of us have been up since 6:30am and we like to read _____.

7) The charity's aim is to help local unemployed youngsters find _____.

8) We are unwilling to pay someone HK$ 60 an hour to iron _____.

9) Booksellers should have a closer look at what is being done at Christmas to promote _____.

10) Grandma told us that she didn't like people to drink _____ all day.

11) He says that when a bomb goes off, people repair _____ afterwards.

12) Most retired people like a quiet life and don't drive _____.

13) Someone who has difficulty with spelling will find it hard to use _____.

- **To be continued (Questions 14 -30) -**

Instructions:
- If you find that a sentence is **INCORRECT**, fill in the blank with appropriate words (**maximum of 3 words**).

- If you find that a sentence is **CORRECT, <u>do NOT put any words in the blank</u>**, just **<u>put a '√'.</u>**

14) David said to his friends, "When I am not writing, I draw _____".

15) Bill will never learn to draw _____ if we do not teach him how to do it.

16) Denise and Tony say that they are learning to drive _____.

17) In urban areas there are more opportunities for women with higher education to find

_____.

18) Tom and David do not take drugs.   They do not drink _____.

19) I'm sure you read _____every night before going to sleep.

20) The business fund will be used to promote _____ both in Hong Kong and overseas.

21) People say that vitamin B5 helps to thicken hair and repair _____.

22) Some of my friends sat down on the sand and began to drink _____.

23) Librarians are actively engaged in seeking to encourage others to use _____.

24) I'll drive _____because I have a licence and I'm really quite good.

25) Generally speaking, lazy people only iron _____ when they are forced to.

26) You don't have to queue and buy _____ at the office.

27) Some students in this primary school read _____ inefficiently and ineffectively.

28) A friend pointed out how boring it would be to iron _____all evening.

29) It doesn't cost much to go for a walk or to learn to draw _____.

30) John and Peter use the library or regularly buy _____.

- **End of Task 2 -**

Appendix C. Sample Acceptability Judgment Test and Interpretation Test

Task 3

Instructions:

- Read each sentence carefully. Try to work as quickly and as accurately as you can.
  For each question:
- If the sentence is CORRECT, (i) tick the Correct box and (ii) circle the BEST answer (a) OR (b).
- If the sentence is INCORRECT, (i) tick the Incorrect box, (ii) write any changes on the line, and (iii) circle the best answer (a) OR (b).
- You are <u>NOT expected to go back</u> to your previous answer and make changes after you have completed it.
- Ignore any spelling or punctuation problems.

1.

Mum said to us, "It may rain soon, so you should get umbrellas".   We answered, "We don't use when it rains".

☐   Correct
Circle (a) or (b):
We don't use   <u>a. umbrellas</u>   <u>b. anything</u>   when it rains.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
We don't use   <u>a. umbrellas</u>   <u>b. anything</u>   when it rains.

2.

Grace has a broken bicycle.   Alex doesn't know how to repair for her.

☐   Correct
Circle (a) or (b):
Alex doesn't know how to repair   <u>a. the broken bicycle</u>   <u>b. anything</u>   for Grace.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Alex doesn't know how to repair   <u>a. the broken bicycle</u>   <u>b. anything</u>   for Grace.

3.

My father doesn't like this sports car.   He won't buy from the company.

☐   Correct
Circle (a) or (b):
My father won't buy   <u>a. this sports car</u>   <u>b. anything</u>   from the company.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
My father won't buy   <u>a. this sports car</u>   <u>b. anything</u>   from the company.

4.

Our customers don't like 10-seater cars.   We won't promote in the next exhibition.

☐   Correct
Circle (a) or (b):
We won't promote   a. 10-seater cars   b. anything   in the next exhibition.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
We won't promote   a. 10-seater cars   b. anything   in the next exhibition.

5.

I am looking for my door keys.   I could not find in my pocket.

☐   Correct
Circle (a) or (b):
I could not find   a. my door keys   b. anything   in my pocket.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
I could not find   a. my door keys   b. anything   in my pocket.

6.

David asked Mary to bring a compass to her hiking event.   Mary said, "I won't use when I hike".

☐   Correct
Circle (a) or (b):
Mary won't use   a. a compass   b. anything   when she hikes.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Mary won't use   a. a compass   b. anything   when she hikes.

7.

Grandma handed her grandson a bar of soap for his shower.   He said, "I don't use when I take a shower".

☐   Correct
Circle (a) or (b):
The grandson doesn't use   a. a bar of soap   b. anything   when he takes a shower.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
The grandson doesn't use   a. a bar of soap   b. anything   when he takes a shower.

8.

Two schools in this village have been badly damaged.   The council is not going to repair for those villagers.

☐   Correct
Circle (a) or (b):
The council is not going to repair   a. the two schools   b. anything for those villagers.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
The council is not going to repair   a. the two schools   b. anything for those villagers.

9.

My friend said to me, "Draw your portrait when you are at home".   I replied, "I don't draw at home".

☐   Correct
Circle (a) or (b):
I don't draw   a. my portrait   b. anything   at home.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
I don't draw   a. my portrait   b. anything   at home.

10.

Tiffany likes her husband's sports car.   She doesn't drive without the presence of her husband.

☐   Correct
Circle (a) or (b):
Tiffany doesn't drive a. her husband's sports car   b. anything   without the presence of her husband.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Tiffany doesn't drive a. her husband's sports car   b. anything   without the presence of her husband.

11.

Tom asked Kitty, "Would you read science books in your leisure time?"   Kitty answered, "I don't read in my leisure time".

☐   Correct
Circle (a) or (b):
Kitty doesn't read   a. science books   b. anything   in her leisure time.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Kitty doesn't read   a. science books   b. anything   in her leisure time.

12.

Mum asked, "Could you get me the necklace from the jewellery box?"   I said, "I couldn't find in the jewellery box".

☐   Correct
Circle (a) or (b):
I couldn't find   <u>a. the necklace</u>   <u>b. anything</u>   in the jewellery box.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
I couldn't find   <u>a. the necklace</u>   <u>b. anything</u>   in the jewellery box.

13.

Grandad likes reading comic books in public libraries.   He doesn't read at home.

☐   Correct
Circle (a) or (b):
Grandad doesn't read   <u>a. comic books</u>   <u>b. anything</u>   at home.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Grandad doesn't read   <u>a. comic books</u>   <u>b. anything</u>   at home.

14.

Jason asked Mary to iron his handkerchief.   Mary said, "I don't iron for you".

☐   Correct
Circle (a) or (b):
Mary doesn't iron   <u>a. the handkerchief</u>   <u>b. anything</u>   for Jason.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Mary doesn't iron   <u>a. the handkerchief</u>   <u>b. anything</u>   for Jason.

15.

Michael bought me a vacuum cleaner a year ago.   I don't use when I clean my flat.

☐   Correct
Circle (a) or (b):
I don't use   <u>a. the vacuum cleaner</u>   <u>b. anything</u>   when I clean my flat.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
I don't use   <u>a. the vacuum cleaner</u>   <u>b. anything</u>   when I clean my flat.

16.

Our buyers decided not to purchase toys from us.   Our sales team will not promote on their business trip.

☐   Correct
Circle (a) or (b):
Our sales team will not promote   <u>a. toys</u>   <u>b. anything</u>   on our buyers' business trip.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Our sales team will not promote   <u>a. toys</u>   <u>b. anything</u>   on our buyers' business trip.

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17.

Peter said to Sue, "A little drop of wine every morning does you good".   Sue said, "I don't drink in the morning".

☐ Correct
Circle (a) or (b):
Sue doesn't drink   a. a little drop of wine   b. any alcoholic drinks   in the morning.

☐ Incorrect (write any changes):   _____
Circle (a) or (b):
Sue doesn't drink   a. a little drop of wine   b. any alcoholic drinks   in the morning.

18.

Grandma said to Sandy, "Put your brother's socks on the ironing board and iron them".
Sandy said, "I don't iron for him".

☐ Correct
Circle (a) or (b):
Sandy doesn't iron   a. the socks   b. anything   for her brother.

☐ Incorrect (write any changes):   _____
Circle (a) or (b):
Sandy doesn't iron   a. the socks   b. anything   for her brother.

19.

Mum told me to draw my pet.   I said, "I don't draw at home".

☐ Correct
Circle (a) or (b):
I don't draw   a. my pet   b. anything   at home.

☐ Incorrect (write any changes):   _____
Circle (a) or (b):
I don't draw   a. my pet   b. anything   at home.

20.

The new computer is being sold at a high price in this shop.   Jason said, "I won't buy from that shop".

☐ Correct
Circle (a) or (b):
Jason won't buy   a. the new computer   b. anything   from that shop.

☐ Incorrect (write any changes):   _____
Circle (a) or (b):
Jason won't buy   a. the new computer   b. anything   from that shop.

21.

Susan irons Paul's shirts before he goes to work.   Paul doesn't iron at weekends.

☐   Correct
Circle (a) or (b):
Paul doesn't iron   a. his shirts   b. anything   at weekends.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Paul doesn't iron   a. his shirts   b. anything   at weekends.

22.

In my art class, Paul asked me to draw a cartoon dog.   I said, "I don't want to draw in the class".

☐   Correct
Circle (a) or (b):
I don't want to draw   a. a cartoon dog   b. anything   in the class.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
I don't want to draw   a. a cartoon dog   b. anything   in the class.

23.

John bought Susan a carrier bag for her shopping.   She doesn't use when she shops every day.

☐   Correct
Circle (a) or (b):
Susan doesn't use   a. the carrier bag   b. anything   when she shops every day.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Susan doesn't use   a. the carrier bag   b. anything   when she shops every day.

24.

Sandy is going to buy two bottles of champagne for a party.   This doesn't mean that she will drink at the party.

☐   Correct
Circle (a) or (b):
This doesn't mean that Sandy will drink   a. champagne   b. any alcoholic drinks at the party.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
This doesn't mean that Sandy will drink   a. champagne   b. any alcoholic drinks at the party.

25.

John broke a window in Susan's bedroom.   He said, "It's not my fault. I don't repair for her".

☐   Correct
Circle (a) or (b):
John doesn't repair   a. the window   b. anything   for Susan.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
John doesn't repair   a. the window   b. anything   for Susan.

26.

The red handbag in this bag shop is so expensive.   I can't buy from that bag shop.

☐ Correct
Circle (a) or (b):
I can't buy   <u>a. the red handbag</u>   <u>b. anything</u>   from that bag shop.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
I can't buy   <u>a. the red handbag</u>   <u>b. anything</u>   from that bag shop.

27.

David use to draw cartoons.   He won't draw after his college graduation.

☐ Correct
Circle (a) or (b):
David won't draw   <u>a. cartoons</u>   <u>b. anything</u>   after his college graduation.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
David won't draw   <u>a. cartoons</u>   <u>b. anything</u>   after his college graduation.

28.

Mum asked Tom to use a pencil to draw his cat.   Tom said, "I don't draw with a pencil".

☐ Correct
Circle (a) or (b):
Tom doesn't draw   <u>a. his cat</u>   <u>b. anything</u>   with a pencil.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
Tom doesn't draw   <u>a. his cat</u>   <u>b. anything</u>   with a pencil.

29.

Jack likes reading ghost stories at night.   His mother said to him, "Don't read after midnight".

☐ Correct
Circle (a) or (b):
Jack was told not to read   <u>a. ghost stories</u>   <u>b. anything</u>   after midnight.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
Jack was told not to read   <u>a. ghost stories</u>   <u>b. anything</u>   after midnight.

30.

There may be a problem with the Rolex watch in your watch collection.   You shouldn't ask your son to repair for you.

☐ Correct
Circle (a) or (b):
You shouldn't ask your son to repair   <u>a. the Rolex watch</u>   <u>b. anything</u>   for you.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
You shouldn't ask your son to repair   <u>a. the Rolex watch</u>   <u>b. anything</u>   for you.

31.

Joey and Kitty read cookbooks in public libraries.   They don't buy from bookshops.

☐ Correct
Circle (a) or (b):
Joey and Kitty don't buy   a. cookbooks   b. anything   from bookshops.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
Joey and Kitty don't buy   a. cookbooks   b. anything   from bookshops.

32.

Can I borrow Andrew's 8-seater car this Saturday?   He doesn't drive on Saturdays.

☐ Correct
Circle (a) or (b):
Andrew doesn't drive   a. his 8-seater car   b. anything   on Saturdays.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
Andrew doesn't drive   a. his 8-seater car   b. anything   on Saturdays.

33.

Tim's family is going to buy a pink car for his travelling between school and home.   Tim said,

"I don't drive on school days".

☐ Correct
Circle (a) or (b):
Tim doesn't drive   a. his pink car   b. anything   on school days.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
Tim doesn't drive   a. his pink car   b. anything   on school days.

34.

The blue jacket in this shop is so expensive.   Peter can't buy from the shop.

☐ Correct
Circle (a) or (b):
Peter can't buy a. the blue jacket   b. anything   from the shop.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
Peter can't buy a. the blue jacket   b. anything   from the shop.

35.

My coffee machine is broken.   No one is going to repair for me.

☐ Correct
Circle (a) or (b):
No one is going to repair   a. the coffee machine   b. anything   for me.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
No one is going to repair   a. the coffee machine   b. anything   for me.

36.

Mum irons Jason's trousers every weekend.　Jason said, "I don't iron in my leisure time".

☐　Correct
Circle (a) or (b):
Jason doesn't iron　　a. his trousers　　　　b. anything　in his leisure time.

☐　Incorrect (write any changes): _____
Circle (a) or (b):
Jason doesn't iron　　a. his trousers　　　　b. anything　in his leisure time.

37.

David has been driving taxis for 10 years and he is retiring tomorrow. He doesn't want to drive

after his retirement.

☐　Correct
Circle (a) or (b):
David doesn't want to drive　　a. a taxi　　　b. anything　after his retirement.

☐　Incorrect (write any changes): _____
Circle (a) or (b):
David doesn't want to drive　　a. a taxi　　　b. anything　after his retirement.

38.

Most of our readers can't read books in Spanish.　We are not going to promote at the next

book fair.

☐　Correct
Circle (a) or (b):
We are not going to promote　　a. books in Spanish　　　b. anything　at the next book fair.

☐　Incorrect (write any changes): _____
Circle (a) or (b):
We are not going to promote　　a. books in Spanish　　　b. anything　at the next book fair.

39.

You said that you put the comics on the bookshelf.　I can't find on the bookshelf.

☐　Correct
Circle (a) or (b):
I can't find　　a. the comics　　b. anything　on the bookshelf.

☐　Incorrect (write any changes): _____
Circle (a) or (b):
I can't find　　a. the comics　　b. anything　on the bookshelf.

40.

Susan is going to buy a glass of white wine for Daniel at breakfast time.   Daniel said, "I don't drink in the morning".

☐   Correct
Circle (a) or (b):
Daniel doesn't drink   <u>a. white wine</u>   <u>b. any alcoholic drinks</u>   in the morning.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Daniel doesn't drink   <u>a. white wine</u>   <u>b. any alcoholic drinks</u>   in the morning.

41.

People in this area can't afford to buy Rolls Royces.   We are not going to promote on our sales day.

☐   Correct
Circle (a) or (b):
We are not going to promote   <u>a. Rolls Royces</u>   <u>b. anything</u>   on our sales day.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
We are not going to promote   <u>a. Rolls Royces</u>   <u>b. anything</u>   on our sales day.

42.

During the day, Vicky spent seven hours reading her comics.   Her mother said, "Don't read after dinner".

☐   Correct
Circle (a) or (b):
Vicky was told not to read   <u>a. her comics</u>   <u>b. anything</u>   after dinner.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Vicky was told not to read   <u>a. her comics</u>   <u>b. anything</u>   after dinner.

43.

Daniel asked Esther, "Why don't you sell your Toyota?   You won't drive after retirement".

☐   Correct
Circle (a) or (b):
Esther won't drive   <u>a. her Toyota</u>   <u>b. anything</u>   after retirement.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Esther won't drive   <u>a. her Toyota</u>   <u>b. anything</u>   after retirement.

44.

Customers will not buy yellow plastic shoes.   We are not going to promote in the exhibition.

☐ Correct
Circle (a) or (b):
We are not going to promote   a. yellow plastic shoes   b. anything   in the exhibition.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
We are not going to promote   a. yellow plastic shoes   b. anything   in the exhibition.

45.

Mum asked me to get two spoons from a tray on the table.   I answered, "I can't find on the tray".

☐ Correct
Circle (a) or (b):
I can't find   a. two spoons   b. anything   on the tray.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
I can't find   a. two spoons   b. anything   on the tray.

46.

John likes a glass of red wine after meals.   Peter doesn't drink after meals.

☐ Correct
Circle (a) or (b):
Peter doesn't drink   a. red wine   b. any alcoholic drinks   after meals.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
Peter doesn't drink   a. red wine   b. any alcoholic drinks   after meals.

47.

I am looking for my blue shirt.   I can't find in my wardrobe.

☐ Correct
Circle (a) or (b):
I can't find   a. my blue shirt   b. anything   in my wardrobe.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
I can't find   a. my blue shirt   b. anything   in my wardrobe.

48.

Mum asked Alex to read textbooks at home.   Alex said, "It's difficult to get me to read at home".

☐ Correct
Circle (a) or (b):
It is difficult to get Alex to read a. textbooks   b. anything   at home.

☐ Incorrect (write any changes): _____
Circle (a) or (b):
It is difficult to get Alex to read a. textbooks   b. anything   at home.

49.

Annie asked Tom to iron her socks.   Tom said, "I don't iron for you".

☐   Correct
Circle (a) or (b):
Tom doesn't iron   a. the socks   b. anything   for Annie.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Tom doesn't iron   a. the socks   b. anything   for Annie.

50.

Mary asked Peter, "Would you like some whisky now?"   Peter answered, "I don't drink at lunch".

☐   Correct
Circle (a) or (b):
Peter doesn't drink   a. whisky   b. any alcoholic drinks   at lunch.

☐   Incorrect (write any changes):   _____
Circle (a) or (b):
Peter doesn't drink   a. whisky   b. any alcoholic drinks   at lunch.

- **End of Task 3 -**

Appendix D. Test items with anaphoric specific and non-specific objects

With an anaphoric specific object (a pronoun or a DP)

1. My friend said to me, "Draw your portrait when you are at home". I replied, "I don't draw **it** at home".

2. Mum asked Tom to use a pencil to draw his cat. Tom said, "I don't draw **it** with a pencil".

3. Mum told me to draw my pet. I said, "I don't draw **it** at home".

4. Tiffany likes her husband's sports car. She doesn't drive **it** without the presence of her husband.

5. Can I borrow Andrew's 8-seater car this Saturday? He doesn't drive **it** on Saturdays.

6. Daniel asked Esther, "Why don't you sell your Toyota? You won't drive **it** after retirement".

7. During the day, Vicky spent seven hours reading her comics. Her mother said, "Don't read **them** after dinner".

8. Jason asked Mary to iron his handkerchief. Mary said, "I don't iron **it** for you".

9. Grandma said to Sandy, "Put your brother's socks on the ironing board and iron them". Sandy said, "I don't iron **them** for him".

10. Susan irons Paul's shirts before he goes to work. Paul doesn't iron **them** at weekends.

11. Mum irons Jason's trousers every weekend. Jason said, "I don't iron **them** in my leisure time".

12. Annie asked Tom to iron her socks. Tom said, "I don't iron **them** for you".

With an anaphoric non-specific object (a pronoun or a DP)

13. Tom asked Kitty, "Would you read science books in your leisure time?" Kitty answered, "I don't read **them** in my leisure time".

14. Grandad likes reading comic books in public libraries. He doesn't read **them** at home.

15. David is used to drawing cartoons. He won't draw **them** after his college graduation.

16. Jack likes reading ghost stories at night. His mother said to him, "Don't read **them** after midnight".

17. David has been driving taxis for 10 years and he is retiring tomorrow. He doesn't want to drive **them** after his retirement.

18. Mum asked Alex to read textbooks at home. Alex said, "It's difficult to get me to read **them** at home".

19. Mary asked Peter, "Would you like whisky now?" Peter answered, "I don't drink **whisky** at lunch".

20. Peter said to Sue, "A little drop of wine every morning does you good". Sue said, "I don't drink **wine** in the morning".

21. In my art class, Paul asked me to draw a cartoon dog. I said, "I don't want to draw **a cartoon dog** in the class".

22. Sandy is going to buy two bottles of champagne for a party. This doesn't mean that she will drink **some** at the party.

23. Susan is going to buy a glass of white wine for Daniel at breakfast time. Daniel said, "I don't drink **white wine** in the morning".

24. John likes a glass of red wine after meals. Peter doesn't drink **red wine** after meals.

25. Tim's family is going to buy a pink car for his travelling between school and home. Tim said, "I don't drive **a pink car** on school days".

Appendix E. Personal bio-data sheet (Chinese)

(1) Today's date: _____

(2) Gender: _____(Male / Female)

(3) Age: _____

(4.1) First language(s): _____(e.g. Cantonese/Mandarin)

(4.2) If you have more than one first language, which language is dominant/stronger (if any)? _____

(5) Other language(s) (e.g. English /Japanese)   (Circle your approximate level)

_____	elementary /	intermediate /	upper-intermediate /	advanced
_____	elementary /	intermediate /	upper-intermediate /	advanced
_____	elementary /	intermediate /	upper-intermediate /	advanced
_____	elementary /	intermediate /	upper-intermediate /	advanced

(6) For how many years have you studied English? _____

(7.1) Have you ever studied/worked/ lived in an English-speaking country for <u>more than TWO months</u>? _____Yes/No

(7.2) If Yes, which country, and for how long? _____

(8) What was the medium of instruction in your secondary school(s) and post-secondary college?

F.1 – F.5   _____ (e.g. English/Chinese)

F.6 – F.7   _____ (e.g. English/Chinese)

Post-secondary college _____ (e.g. English/Chinese)

(9) What is/was your post-secondary college and/or university? (e.g. Hong Kong Community College / City University of Hong Kong) _____

(10) What is/are your programme major(s)? (e.g. Associate Degree in Business/Language)

_____

(11) What was your latest IELTS/TOEFL score (if any), and in which year was it?

IELTS score _____ (Year _____)   TOEFL score _____ (Year _____)

(12) What is your main language when speaking with (if any)?

Family members _____ (Cantonese/English, etc.)

School friends in the classroom _____ (Cantonese/English, etc.)

School friends outside the classroom: _____ (Cantonese/English, etc.)

Colleagues in your workplace (if any):_____ (Cantonese/English, etc.)

Friends: _____ (Cantonese/English, etc.)

- To be continued (Page 2) -

(13) On average, how many hours **EACH DAY** do you use **English** (oral and written) when you communicate with: (Circle your answer)

Family members	0	less than 1	$1 \le x < 2$	$2 \le x < 3$	$3 \le x < 4$	4 or more
School friends in the classroom	0	less than 1	$1 \le x < 2$	$2 \le x < 3$	$3 \le x < 4$	4 or more
School friends outside the classroom	0	less than 1	$1 \le x < 2$	$2 \le x < 3$	$3 \le x < 4$	4 or more
Colleagues in your workplace (if any)	0	less than 1	$1 \le x < 2$	$2 \le x < 3$	$3 \le x < 4$	4 or more
Friends	0	less than 1	$1 \le x < 2$	$2 \le x < 3$	$3 \le x < 4$	4 or more

(14.1) Do you have any English-speaking domestic worker (e.g. Filipino/Indonesian)? (Circle your answer)Yes/No

(14.2) If Yes, at what age did you have an English-speaking domestic worker, and for how long? _____

(14.3) If Yes, which language(s) do you speak to your domestic worker? _____(Cantonese/English, etc.)

(15) On average, how many hours **EACH WEEK** do you use **English**? (Circle your answer)

Writing	0	less than 7	$7 \le x < 14$	$14 \le x < 21$	$21 \le x < 28$	28 or more
Reading	0	less than 7	$7 \le x < 14$	$14 \le x < 21$	$21 \le x < 28$	28 or more
Speaking	0	less than 7	$7 \le x < 14$	$14 \le x < 21$	$21 \le x < 28$	28 or more
Listening	0	less than 7	$7 \le x < 14$	$14 \le x < 21$	$21 \le x < 28$	28 or more

- **End –**

Appendix F. Personal bio-data sheet

(native English speakers)

(1) Today's date: _____

(2) Gender: _____(Male / Female)

(3) Age: _____

(4.1) First language(s): _____(e.g. English)

(4.2) If you have more than one first language, which language is dominant/stronger (if any)? _____

(5) Other language(s) (e.g. German /French / Mandarin / Cantonese)   (Circle your approximate level)

_____   elementary /   intermediate /   upper-intermediate /   advanced

_____   elementary /   intermediate /   upper-intermediate /   advanced

_____   elementary /   intermediate /   upper-intermediate /   advanced

_____   elementary /   intermediate /   upper-intermediate /   advanced

(6.1) Have you ever studied / worked / lived in a Chinese-speaking country (Mandarin or Cantonese) for more than ONE month? ____ Yes / No

(6.2) If Yes, which country or city, and for how long? _____

(7) Have you taken any Mandarin or Cantonese language class?   _____Yes / No

(7.1) If Yes, which language, and at what level (elementary/intermediate/upper-intermediate/advance), and for how long? _____

(8) What is your highest level of education?

☐   Primary or below

☐   Secondary GCSE levels

☐   Secondary / College A-levels

☐   University: Undergraduate degree

☐   University: Postgraduate degree

☐   Others (please specify: _____)

-   End -

Appendix G.   Consent form

Newcastle University

NEWCASTLE UNIVERSITY

FORM OF CONSENT TO TAKE PART IN A RESEARCH PROJECT

<u>CONFIDENTIAL</u>

Project Title: Learning and un-learning null objects in English by Chinese

I, the undersigned participant, agree to take part in the above named project, the details of which have been fully explained to me. The researcher explained to me all of what is required from me in this study, and he clarified anything might affect me as a participant in this project. The researcher provided me with a project description copy which fully explains the project and my contribution to the study. I understand I may withdraw from the research at any time and for any reason. Also, the researcher took the full responsibility to keep data confidential and my identity anonymous in the study.

Name _____ Signature _____   Date _____

     (Participant's full name)

I, the undersigned researcher, certify that the details of this project have been fully explained and described in writing to the participant named above and have been understood by him / her. I also take the full responsibility to keep data confidential and the participant's identity anonymous. The participant's privacy and safety is my top responsibility in this project.

Name <u>Chi-wai Lee (Patrick)</u>   Signature_____   Date_____