

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

**Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600**

UMI[®]



Université d'Ottawa • University of Ottawa

Null Subject and Null Object in Child Chinese

by

Bin Wu

Department of Linguistics

University of Ottawa

under the supervision of

Professor Helen Goodluck

Thesis submitted to the School of

Graduate Studies and Research

of the University of Ottawa

in partial fulfilment of the requirements

for the degree of Master of Arts in

Linguistics

Bin Wu, Ottawa, Canada 1999



National Library
of Canada

Acquisitions and
Bibliographic Services

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale
du Canada

Acquisitions et
services bibliographiques

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-48189-1

Canada

Acknowledgements

My boundless gratitude is extended to my thesis advisor, Professor Helen Goodluck, for all her patience, insightful comments and intellectual & financial support. She guided me towards the amazing world of psycholinguistics and has been an inexhaustible source of knowledge. Her rigorous scientific approach and unparalleled gift for linguistics convinced me that to pursue a linguistic degree at the University of Ottawa is something one really needs to be proud of.

I also owe special thanks to all the professors who have taught me before, esp. Professor M.L. Rivero, whose excellent teaching has generated my initial interest in the Chinese Empty Categories; and Professor Paul Hirschbühler, whose kind encouragement and valuable comments have steered me in the right direction of linguistic research.

I would also like to thank all the professors in my former university in China for reserving my teaching position in the Foreign Language Department for as long as five years, despite the fact that I am already a permanent resident of Canada.

My hearty thanks also go to H.M. Walker who proofread my thesis and everyone else involved in the Psycholinguistic Research Group for their nice help and advice on this paper. This research was supported in part by the Social Sciences and Humanities Research Council of Canada grant number 410-98-0511 to Helen Goodluck and Eithne Guilfoyle and by a School of Graduate Studies summer research fellowship.

A particular debt of thanks goes to my husband whose farsightedness and intelligence let me fully grasp the true essence of being a real intellectual.

Last but not least, I would like to dedicate this thesis to my parents whose unfailing encouragement has made me firmly believe that Chinese is such a uniquely beautiful language in the world linguistic field that any hard work done on it would be undoubtedly worthwhile. This being the truth, the following Chinese idiom may best describe the significance of this piece of work:

中西合璧

Abstract

This study is focused on the null subject and object phenomenon in Chinese child language. Its goal is to investigate null subject and object use in the Chinese spontaneous speech in the light of the debates in the previous literature.

The first two chapters elaborate on the adult grammar of the empty categories and the debates about this phenomenon in the Chinese linguistic literature. Two types of approaches are introduced in these two chapters. A detailed account of the data analysis regarding the Chinese children's naturalistic speech is given in Chapter Four, in comparison with Valian's (1991, 1995) work on child English, Italian and Portuguese.

The basic finding of this study is that Chinese speaking children increase their use of subjects, particularly their use of pronominal subjects, as they get older. This strongly demonstrates that this study has accomplished its goal of supporting the performance-based accounts of children's subject and object use.

Null Subject and Null Object in Child Chinese

Chapter 1 Introduction	1
1.1 Null Subjects and Objects and Language Acquisition	1
1.2 Outline of the Thesis	1
Chapter 2 The Grammar of Null Subjects and Objects.....	2
2.1 Null Subjects	2
2.2 Null Objects.....	3
2.3 Linguistic Analysis of Null Subject and Null Object	5
Chapter 3 Null Subject and Object in Child Language.....	15
3.1 Two Different Accounts on Null Subject & Object in Child Language.....	15
3.2 Valian's Two Studies	18
Chapter 4: Null Subject and Object in Child Chinese.....	27
4.1. Research Questions	27
4.2. Data and Methodology	27
4.3. Results	29
Chapter 5 Discussion and Conclusion.....	39
References	44
Appendix One.....	47
Null Subject and Object Use of Children and Adults	47
Appendix Two.....	87
Verb Use of Children and Adults.....	87

Chapter 1 Introduction

1.1 Null Subjects and Objects and Language Acquisition

Languages such as English, French, German, etc. which do not allow subjects to be dropped are called non-null subject languages (NNSL). Those which allow non-overt subjects are called null subject languages which include some Romance languages and Asian languages.

Hyams (1983, 1986), Jaeggli and Hyams (1988), Lillo-Martin (1986), Guilfoyle (1984), Pierce (1982), Lebeaux (1987), Borer and Wexler (1992), Radford (1990) and others have argued that the subject omission in each child language is rooted in the child's developing grammatical system. The omission of subjects in languages such as English is then a matter of a non-adult competence grammar.

By contrast, a number of researchers, for example, L. Bloom (1970), Pinker (1984), Valian (1991), and P. Bloom (1990), have argued that children drop subjects because of processing constraints. On this view, omission of subjects is due to a performance deficit.

The goal of this paper is to investigate null subject and object use in Chinese child spontaneous speech in the light of these debates.

1.2 Outline of the Thesis

Chapter 2 discusses the adult grammar of the empty categories and debates about this phenomenon in the linguistic literature on Chinese; Chapter 3 elaborates on null subject and object phenomena in child language. In chapter 4, a detailed account of the data analysis is given with respect to an empirical study of Chinese child speech, in comparison with Valian's (1991, 1995) work on child English, Italian and Portuguese. Finally, chapter 5 argues that this study has accomplished its goal of supporting the performance-based accounts of children's use of subjects and objects.

Chapter 2 The Grammar of Null Subjects and Objects

2.1 Null Subjects

Languages which allow pronominal subjects to be left unexpressed are called pro-drop or null subject languages (NSLs). Generally, there are two kinds of null subject languages: one includes some Romance languages such as Italian, Spanish and Portuguese, the other involves Asian languages including Chinese, Japanese and Korean. (1) is an example of subject drop in Italian, and (2) is an example of subject drop in Mandarin Chinese. The null subject is designated “e”.

(1) e ha parlato

has (3rd) spoken.

‘ [he] has spoken. ’

(2) [e lai le]

come ASP

‘ [he]came.’

According to Chomsky (1982), in Italian-type NSLs, where there is overt agreement between the subject and the verb, the subject can be dropped, because the deletion is recoverable. Since Italian-type languages have a rich inflection system, the subject-verb agreement permits subject drop while in English-type languages it does not (see also Rizzi, 1996). Thus, Italian is a pro-drop language, English is not. This cross-linguistic variation is referred to as the pro-drop parameter, formalized by Rizzi (1986) as

(A) Pro is governed by X_y^0 .

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

The choice of X^0 varies cross-linguistically. In Italian and Spanish INFL is the choice for X^0 in (A). In English, INFL is not a choice for X in (A), hence there are not null arguments in subject positions.

However, pro-drop does occur in languages which lack agreement entirely, e.g. Chinese, Japanese and Korean. To accommodate this fact, Jaeggli (1982) proposed the Identification Hypothesis which is as follows:

The Null Subject Parameter

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

A paradigm is uniform if all its forms are morphologically complex or if none of them are. If the paradigm is mixed, e.g. in English, then it is not uniform (English has third person singular agreement, but no other agreement, and so is non-uniform). All the above-mentioned languages have morphological uniformity according to Jaeggli's definition: in Romance NSLs, the subject and verb always agree, whereas in Asian NSLs, there is no agreement at all between the subject and the verb. The mechanism for licensing subject drop is different in the two cases. In Romance NSLs, the NS is licensed by the agreement, making the properties of the subject recoverable. In the case of Asian NSLs, the subject is licensed in terms of the discourse topic.

2.2 Null Objects

Examples (3-5) illustrate object drop in Italian, Portuguese and Chinese, respectively.

(3) La buona musica riconcilia e con se stessi

the good music reconciles with themselves

'Good music reconciles one with oneself.' (Italian, Rizzi 1986)

(4) Jose sabe que Maria viu e

Jose knows that Maria saw

‘Jose knows that Maria saw him.’ (Portuguese, Raposo 1986)

(5) a. Zhangsan shuo Lisi kanjian e

Zhangsan say Lisi saw Perf

‘Zhangsan said that Lisi saw him.’

b. Zhangsan chi e

Zhangsan

‘Zhangsan eats it.’ (Chinese, Huang 1984)

In the case of Romance NSLs, it is predicted there is no object drop, since there is no agreement between the finite verb and the object which can license this drop. In Italian, the occurrence of null objects is in fact highly restricted. In examples such as (3), the non-overt object has an arbitrary reading. Rizzi (1986) analyses such examples as involving a non-overt object with the features [+masculine, +plural], which is interpreted by a rule of Arb Interpretation.

In Portuguese, it is possible to have null objects with a non-arbitrary interpretation, as in the case of (4). However, the interpretation is restricted. In (4), the null object cannot be coindexed with the matrix subject (Jose), a fact that has led researchers to propose that the null object is bound by an operator that induces a cross-over effect (Huang 1984); this type of analysis is reviewed in more detail below.

In Asian languages, object drop occurs relatively freely, as we would expect if such languages permit discourse-based recovery of null elements. However, there are restrictions on interpretation, and in the case of (5b), the normal interpretation is that the

embedded null object is not the same person as the matrix subject, similarly to the Portuguese example (4).

2.3 Linguistic Analysis of Null Subject and Null Object

In the 1980s, theorists attempted to analyze null subjects and objects in the framework of empty categories proposed by Chomsky (1982). (See Rizzi, 1986; Huang 1984; Raposo 1986). Null subjects were treated as *pro*, a non-overt pronoun with features [-anaphor, +pronominal]. The analysis of null objects was more controversial and is still subject to debate. Huang proposed that in Chinese null objects were *pro*/*PRO* and subject to a rule of control. Xu (1986) put forward a modified typology of empty categories, proposing that Chinese null objects were a special empty category which he called Free Empty Category. The issue between Huang and Xu will be returned to at the end of this chapter.

According to Chomsky (1982), the classification of NPs is based on two features [\pm Anaphor] and [\pm Prenominal], so there are four possible combinations:

Type	Overt	Non-overt
[+Anaphor, -Prenominal]	Anaphor	NP-trace
[-Anaphor, +Prenominal]	Pronoun	Pro
[-Anaphor, -Prenominal]	R-expression	wh-trace
[+Anaphor, +Prenominal]	-----	PRO

Typology of NPs

Trace must be governed and *PRO* must be ungoverned, trace includes both NP-trace and variable. Chomsky also proposed that if the Empty Category is either trace or *PRO*, then

(i) α is PRO iff it is ungoverned.

(ii) α is a trace iff it is governed.

Moreover, variables are subject to the following:

α is a variable iff $\alpha = [_{NP} e]$ in S bound by an operator.

Unlike NP-trace which is an anaphor, a variable is an R-expression¹ which is case-marked and assigned a θ -role. Furthermore, if a pronoun has the feature [-anaphor, +pronominal], it must be free in its governing category (GC)². Usually, the non-overt NP which has this feature is represented by pro, 'small pro'.

In the light of Chomsky's EC theory, linguists have studied this topic extensively with respect to the languages which they are familiar with. As described above, there are mainly two types of pro-drop languages, Italian-type and Chinese-type. The most heated issue related to this topic in Chinese is undoubtedly how to fix and identify the essential properties of the non-overt subjects and objects in Chinese in the framework of Chomsky's GB theory.

In Italian, as is seen in example (1), the subject ([Spec, IP]) position is occupied by a zero element. Since this null element has no antecedent, it is not a trace. It is not a PRO either, as PRO must be ungoverned. But here this "e" is governed by the finite inflection, so it is a non-overt pronoun with a feature [-Anaphor, +Pronominal], represented by "pro"(a small pro). As in Chinese, pronominal subjects in Italian may remain unexpressed freely.

¹ According to Chomsky. R-expressions include NPs with heads that are in some intuitive sense "potentially referential". e.g. book. John. sincerity. etc.

² "free" = not bound

"GC" = the minimal domain containing the pronoun, its governor and an accessible subject.

The literature on object drop in Italian-type languages is far more complicated. Here are two equivalent examples in Italian vs. English.

(6) Questo conduce e_i a [PRO_i concludere quanto segue].

this leads to conclude what follows

‘This leads one to conclude what follows.’(Italian)

(7) * This leads [PRO to conclude what follows] (English)

The Italian sentence is argued to be grammatical because there is a non-overt controller designated “e” for the object, while in English, there is not such a controller.

Portuguese is like Italian in that it has non-overt subject pronouns as shown in the following:

(8) João_i disse [_{CP} que [_{TP} pro_i viu o Pedro]]

João said that pro saw-3sg Pedro

‘João said that he saw Pedro.’

(9) João_i disse [_{CP} que [_{TP} Pedro viu e_{j-i}]]

João said that Pedro saw e

‘João said that Pedro saw him.’

The null subject in (8) is bound by “João” which is outside the GC (the embedded clause) and hence subjects to Principle B of the Binding Theory. However, in (9), the null object cannot refer to the main clause subject. This suggests that the null object is subject to Principle C instead of Principle B: as an R-expression, it must be free everywhere. This follows under the analysis of Portuguese null objects mentioned above: null objects are wh-traces bound by a non-overt antecedent (i.e. a null topic operator).

Campos (1986) and Huang (1984) argue that this analysis of the properties of the null object as a non-overt topic construction can be applied to Spanish and Chinese (as well as German).

In Authier (1989), it is argued that French, which is not a pro-drop language yet has null object, also has an arbitrary reference, i.e. the null object (PRO) is assigned the default value arb when it is not controlled as is seen in the following:

Trop de bruit rend [PRO_{arb}] sourd.

‘Too much noise makes _{arb} deaf.’

In order to supplement the quantificational force of zero objects in French, the notion of unselective binding is adopted. Namely, the null objects are variables bound at LF by overt or non-overt adverbs of quantification which are adjoined to the clause whose tense selects them. This notion predicts that the referential constraints exhibited by null objects in French fall under Principle C of the Binding Theory. Authier (1989) proposed that the French null objects are also regarded as variables bound by a null operator, i.e. this is subject to Principle C. To argue for the fact the distribution of arbitrary null objects is constrained by Principle C rather than Principle B as suggested by Rizzi (1986), Authier (1989) proposes the following basic structures respectively in a developmental order.

(10) [[s₁[s₂PRO...[s₃...[e]...]...]...]

(Here S₁: [-tense], S₂: infinitive)

(11) [s₁[s₂PRO...[s₃...[e]...]...]...], with the following properties to be constant

(I) S₁ is a tensed matrix clause.

(II) S₂ is an infinitival sentential subject in s₁.

(III) S₃ is a clause embedded within S₂ which contains an arbitrary null object.

(12) [NA[s₁[s₂PRO...[s₃PRO...[e]...]...]]

(Here s₃: [-tense])

Throughout this article, Authier (1989) supports the view that null objects are base-generated as free variables bound by an adverb of quantification at LF level.

As shown above, Chinese, Japanese and Korean also have null objects which do not have agreement at all. According to Huang et al (1984, 1989, 1993), in Chinese, both subject and object drop is discourse oriented.

The correct analysis of object drop in Chinese is a matter of dispute. Huang (1984) proposed that while null subjects may be regarded as genuine null pronominals, null objects are best analyzed as a variable \bar{A} bound by an operator that itself is null as shown in the following example:

(13) Zhangsan shuo [Lisi kanjian e le]

Zhangsan say Lisi see perf

'Zhangsan said that Lisi saw him.'

(13) is analysed as in (14)

(14) [OP_i[Zhangsan shuo [Lisi kanjian e_i le]]]

Huang (1984) proposed a Generalized Control Rule to account for why Chinese, a pro-drop language which does not have agreement, can have both null subject and null object. This rule reads: "Any empty pronominal is controlled in its control domain (if it has one)".³ This is shown in the following example (15)a, where the empty pronominal is

³ According to Huang, α is the control domain for β iff it is the minimal category that satisfies both (a) and (b):

controlled in its control domain. It may be formalized as [s...[VP...[\bar{S} [S pro/PRO...]]]], where pro has the matrix S as its control domain. Since the null subject may refer to the matrix subject “Zhangsan” or to some other person whose reference is understood in discourse, so the null subject is a pronominal. Nonetheless, in (15)b, the null object refers to the discourse topic but not to the matrix subject “Zhangsan”. According to Huang (1984), this subject-object asymmetry indicates that the null object is not a pronominal while the null subject can be a pronominal.

(15)a. Zhang san shuo [pro hen xihuan Lisi]

Zhangsan said very like Lisi

‘Zhangsan said that (he) liked Lisi.’

b. Zhangsan shuo [Lisi hen xihuan i]

Zhangsan say Lisi very like(him)

‘Zhangsan said that Lisi liked (him).’

Thus Huang’s analysis of null object in Chinese is basically the same as for null objects in Portuguese. The representation of topic structures in Chinese is proposed by Xu (1985) as follows:

[s’X[s...Y...]], where X is a major category and Y, possibly empty, is related to X.

a. α is the lowest S or NP that contains (i) β , or (ii) the minimal maximal category containing β (henceforth, MMC(β)).

b. α contains a subject accessible to β .

Since any of the six categories of Chinese (NP, S, S', VP, PrepP and Postprepositional Phrase) can appear in the topic structure, this provides an adequate account of the nature of topic structures in Chinese, provided that the comment is a well-formed clause which relates to the topic.

Huang's (1993) Generalized Control Rule is that an empty pronominal is controlled in its control domain (if it has one). He assumes that PRO and pro are instances of the same category, and the properties of PRO/pro fall under a proper theory of generalized control but not one of generalized binding.

As mentioned above, the topics are viewed as operators by Huang, with a schematic representation as follows:

[_S·O_i O_j [_Se_i V e_j]]

This analysis applies to (5b): the pro is a variable, because in the normal case, this e refers to someone else other than Zhangsan:

(5b) Zhangsan shuo Lisi kanjian e.

Zhangsan say you saw Perf

'Zhangsan said you saw him.'

And it is represented as

[_S'OP_j[_SZhangsang_i shuo ni kanjian le e_j]]

But, the following example from Xu (1986) serves as a counter example:

(16) Gexing yiwei meiren tingjian.

singer think no man hear e

'The singer thought that no man heard (him).'

It is easily seen that here the *e* is coreferential with the matrix subject. This leads Xu (1986) to claim that the Empty Category (EC) is not identifiable with variable.

The following example shows that the EC in Chinese is not identifiable with NP-trace either.

(17) Neige lanzi_i yijing gei women zhuang man e_j

that basket already by we fill up e

‘In that basket things were already filled by us.’

Since we can easily see that there is non-coindexing of the subject and the EC in the above example, the gap is not the result of NP Movement.

Xu (1985) also argues that the EC is neither a PRO nor a pro. See the following examples:

(18) John jueding e mingtian dongshen.

John decided tomorrow leave

‘John decided to PRO leave tomorrow’.

In the English counterpart, EC is a PRO controlled by the matrix subject John, but in Chinese, ‘John’ is not the only possible controller. So EC can take either an intrasentential or an extrasentential controller.

Xu also shows that ECs in Chinese can fulfill the functions of anaphors and pronouns in English type languages, as the following examples illustrate:

(19) John chi le e.	John ye da le e(This happens in the movies)
John eat ASP	John too hit ASP
'John ate it.'	'John hit himself too.'
(e refers to something)	(e refers to John)

Moreover, Xu claims that EC is not the result of a deletion of NP, citing sentences with quantifiers as evidence:

(20) meigeren xiwang (meigeren) neng xingfu.
everyone hope everyone can happy
'Everyone hopes that he himself can be happy.'

(21)meigeren xiwang e neng xingfu.
everyone hope e can happy

'Everyone hopes that he (someone else) can be happy.' (Xu: 1986)

Here, the different interpretations of (20) and (21) simply indicate that EC is not the result of an NP deletion.

To deal with these observations, Xu put forward a modified version of Chomsky's (1982) typology of ECs:

EMPTY CATEGORIES

Type 1: EC without specified features: FEC

Type 2: EC with specific features:

Type 2	EC
[+Anaphor, -Pronominal]	NP-trace
[-Anaphor, +Pronominal]	Pro
[-Anaphor, -Pronominal]	Wh-trace
[+Anaphor, +Pronominal]	PRO

Modified Typology of Type 2 ECs by Xu

Xu argues that a particular language can make use of either Type 1 or Type 2 ECs or both. Chinese uses both. Since the FEC is not required to be coreferential with an antecedent, operator, or controller, indexing in Chinese is not automatic, but necessarily involves pragmatic factors. In other words, in the case of ECs, Xu argues that pragmatics can overrule grammar in Chinese.

Chapter 3 Null Subject and Object in Child Language

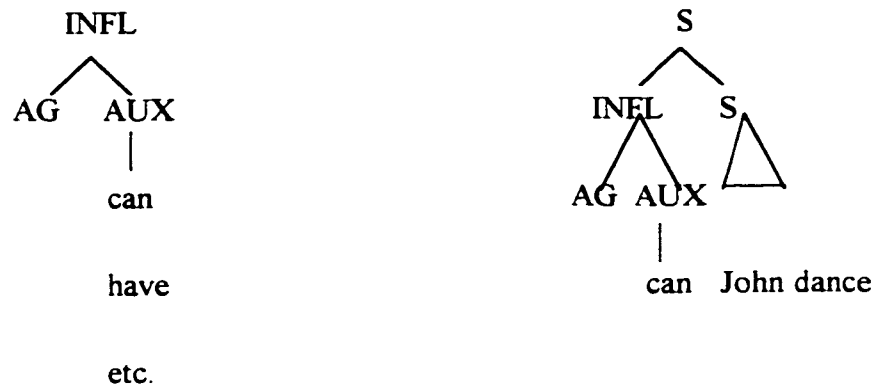
3.1 Two Different Accounts on Null Subject & Object in Child Language

Subject & object omission is a thought-provoking phenomenon in child speech and many studies have been done on this topic. Basically, there are two types of approaches. In Hyams (1983, 1986), Jaeggli and Hyams (1988), Guilfoyle (1984), Pierce (1992) Radford (1990), Roeper and Weissenborn (1990), Lillo-Martin (1986), Wexler (1993), Lebeaux and others, it is argued that the reason why child English differs from the adult grammar in allowing null subjects is rooted in the child's developing grammatical system, namely, in competence constraints. This competence approach is also extended to subject and object drop in child speech in other languages, such as Chinese, Portuguese and Italian. The other group of researchers, including Pinker (1984), L. Bloom (1970), P. Bloom (1990) and Valian (1991, 1995), account for subject drop in child language by adopting a theory of performance constraints. They claim that children drop subjects or objects where the adult grammar does not permit this because of their limited processing and production abilities.

Although the competence and performance approaches are not mutually exclusive, it is of great importance to pull competence and performance factors apart so as to get a clearer idea of which mechanisms govern the subject and object drop of children speaking different types of pro-drop languages.

Essentially, for the Competence Deficit accounts, there are two kinds of explanations. Hyams (1986) gives a competence analysis--the pro hypothesis. The core of the pro hypothesis is that all children begin acquisition with the null subject parameter set positively, so non-NSL-speaking children's speech will grammatically resemble that of the NSL speaking children before they reset the parameter to the correct value for their language.

Following Hyams (1986), since the early grammar of English (and all other languages) is a NS grammar, which, in English (or French) happens not to be the correct setting for the adult grammar. Hyams argues in NSLs, AG=PRO, as AG in NSLs functions like PRO with regard to three respects: first, it may be controlled; second, it may be arbitrary in reference; and third, it must be ungoverned. Where Agreement (AG)=PRO (in NSLs), the resulting configuration would be in violation of the principle that “PRO must be ungoverned”(Chomsky, 1981). How English (an NNSL) differs from Italian (an NSL) is schematized by Hyams (1989) in the following:



(Taken from Hyams, 1989, here, “Move INFL” yields a well-found output iff AUX is lexically specified.)

In brief, Hyams (1989) proposed that grammatical development is a continuous process and the grammars constructed by the child in the course of acquisition are constrained by the principles of UG. Accordingly, the sequence of grammatical development is schematized in Hyams (1989) as follows:

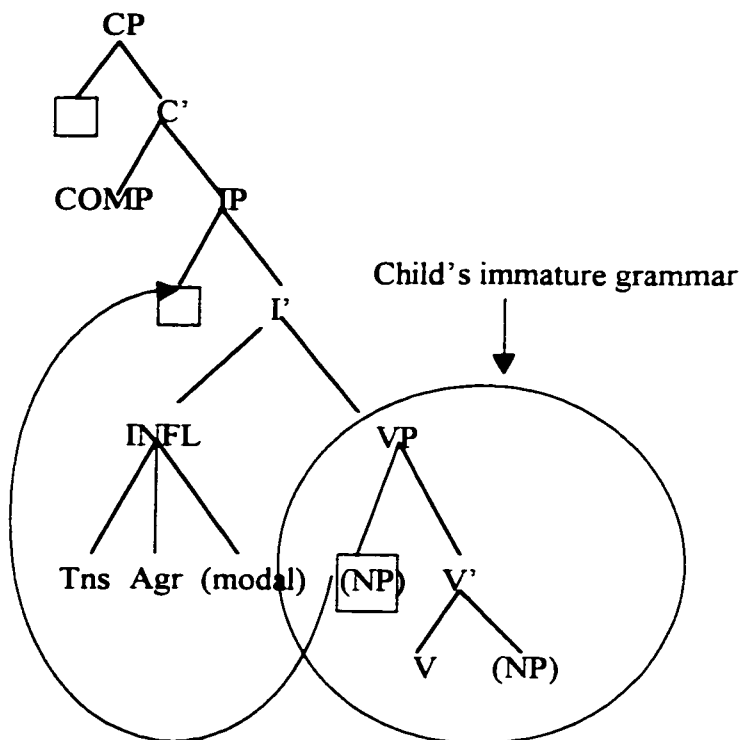
Go, G1, Gn, ..., ..., Gs

Go=UG (universal grammar); Gs=the adult grammar.

The pro-hypothesis (Hyams, 1986,1987) argues that the American child, like the Italian child, has available three types of subjects: full lexical noun phrases (NPs), pronoun NPs,

and pro NPs. If the effect of input is ignored, this pro-hypothesis should predict that children of both languages should produce NSs equally often, since they both think their language is a NSL. And it also predicts that there will be fewer pronoun NPs in the speech of NSL speaker than in an NNSL speech.

Another competence-deficit account is called the VP Hypothesis, (Guilfoyle 1984, Guilfoyle and Nooman 1998, Kazman, 1988) which claims that children's grammar lacks an INFL phrase and only consists of a VP; the lack of an INFL phrase would preclude a subject pronoun from receiving case. The adult English underlying structure (with the circled hypothesized initial child sub-structure) is shown in the tree diagram below:



(taken from Valian, 1991, P26)

The arrow shows that in the English adult grammar, the VP internal subjects will be raised to become subjects of the INFL phrase and will receive nominative case through a tense or agreement element in INFL. Since the child's grammar consists of only a VP, a VP subject

may or may not be present. The V' node in turn has an obligatory V node and an optional direct object NP node.

According to the VP Hypothesis there are no genuine subjects of sentences in child speech--- only subjects of VPs and the VP subjects are optional, i.e. the grammars of all children consist of VPs with optional subjects. So, if the American children at an early point have only VP grammars, then their speech cannot be differentiated from that of other children learning other languages.

Unlike the competence-deficit accounts, a performance-deficit account will predict certain differences between the speech of children learning English vs. Italian. On the performance account, there should be more subjects in American children's speech than in the speech of Italian children, because it is presumed that the American children know their language requires subjects and the Italian children know that overt subjects are syntactically optional in their language. It also predicts that the longer the VP the less likely a lexical subject will be chosen and that children will increase subject use regularly with the increase of age and MLU. Also predicted are asymmetries between subject use and object use as well as an increase in the use of transitive verbs and their obligatory "companion"-objects.

3.2 Valian's Two Studies

In order to achieve her goal of proving that children increase their use of subjects as they grow older, Valian conducted three studies (Valian 1991, Valian & Eisenberg 1995, Valian et al 1996). In Valian (1991), the natural conversations between 21 American children (1;10--2;8) and their mothers were recorded and studied. The data of 5 Italian children (1;6-2;6) were also used to make a comparative study between children learning the two languages. Her study showed that American children used more subjects than Italian children and also the American children increased their subject use (especially pronominal subject use) over time. American children used subjects and pronominal subjects almost twice as much as Italian children. This result was precisely what was predicted by the performance-deficit analysis. By contrast, neither the pro hypothesis nor

the VP hypothesis was confirmed by Valian's study, for it was shown that even low MLU (Mean Length of Utterance) children know that subjects are required, and they not only used expletives across a broad MLU range but also correctly cased nominative pronouns in subject position. Moreover, for two methods used to calculate the lexical subject and pronominal use, the results were surprisingly identical⁴: All American children increased their subject and pronominal subject use constantly. Although Italian children in this study did not show such an increase, Valian predicted that they would increase their use of subjects if they were studied over a longer time period. Valian's (1995) study of the spontaneous speech of 20 Portuguese-speaking children (2;0--2;10) confirmed this prediction. The children's MLU & age were positively correlated with lexical and pronominal use. This has provided strong support for the view that all children, regardless of their target language, increase their use of subjects as development proceeds. The detailed account of Valian (1991) and Valian (1995) of the naturalistic data of American, Italian and Portuguese children will be elaborated below.

In Valian's (1991) first study, 21 American children aged from 1;10 to 2;8 (MLU:1.53-4.38) were audiotaped, using a cassette tape recorder in a natural conversation and playing with their mothers. They were grouped according to MLU (1.77, 2.49, 3.39 and 4.22 respectively). Two taping sessions, no more than two weeks apart were conducted. The age of Group 1 ranged from 1;10 to 2;2, the age of Group 2 ranged from 1;6 to 1;10. Both sessions were performed at the child's home or daycare center. Session 1 was usually half an hour, and Session 2 one hour. The children were divided into four groups, based on their MLUs. They also coded the grammaticality of the utterances lacking subjects. The rule was that an imperative would be classified as grammatical and a declarative missing a subject would be classified as ungrammatical. Exclusions include 1) discards, unintelligible

⁴ In her 1991 study, subject use is calculated in these two ways: 1) the nominator = utterances containing verbs or not, the denominator = all non-imitative non-imperative utterances; 2) the nominator = those utterances with subjects, the denominator = all non-imitative, non-imperative utterances with verbs. The latter definition is also adopted in Valian & Eisenberg (1995).

utterances, interrupted utterances, utterances consisting solely of single-word assents, dissents or hesitations.⁵ Imitation and stock, routine utterances were also subtracted from the usable utterances. However, if the child repeated a parental utterance that was itself an imitation of the child's spontaneous preceding utterance, this repetition was not scored as an imitation. They included utterances with doubtful portions and counted repetitions of the whole utterances as separate utterances.

Questions as well as declaratives were included in the analyses (on condition that the utterance must have a verb). As for wh-questions, in adult grammar, most of the wh-words would not be considered subjects except the underlying objects or adjuncts of the verb (moved into comp), e.g. "that" is considered to be the subject in the sentence "What is that?" However, "What" could be regarded as the underlying subject in "What happened?" In addition, where, how, and why were classified as objects or adjuncts, according to adult grammar.

In the child grammar, it is of interest whether both a wh-word and a subject NP is in the American children's speech. For the subject counts, it was not important whether wh-word or the other NP was classified as the subject, since both were included by the children. Moreover, almost no children omitted the true subject as was proved by the fact that out of 552 wh-questions where the wh-word would not be classified as the subject in the adult grammar, the children supplied a subject in almost all of the cases. However, for the pronominal subject (PS) counts, two analyses were performed: one including wh-questions, and one excluding them. PS were scored either way.

Valian's Italian data were derived from a corpus collected by G. Tirondola of five northern Italian children, audiotaped eleven times (once a month), aged 1;6 to 2;5, each session

⁵Valian (1991) takes this definition from Ervin (1964): An imitation is an utterance which directly follows an adult utterance, is either a full or partial repetition of that utterance, adds no new material, and makes no morphemic alterations. A routine (c.f. Brown, 1973; Peters, 1983) was a stock utterance type used repeatedly by the child with no variation from one time to the next.

lasting 15-30 minutes. The eleven sessions were divided into Time I (the first five visits, aged between 1;6-1;10) and Time II (the last five visits, aged between 2;0-2;5). The Italian children were thus younger than the American Group I at Time I and older at Time 2. Due to the morphological complexity of Italian, MLU was not calculated in the same way with Italian children as with American children; yet, the criteria of exclusions used in this Italian study was the same as for the American children.

For the coding of verb usage, the Italian children at Time I produced the same proportion of utterances with verbs as the American children in Group I (27%), and at Time 2 produced a higher proportion (39%). The measure of subject use and pronominal subject use are elaborated as follows.

I) Total Subject Appearance: The denominator consisted of all nominative non-imperative usable utterances, including questions. The numerator consisted of utterances containing verbs which also contained a subject noun phrase, as well as utterances consisting of a subject NP plus and object NP, with a missing verb. Thus, utterances such as “This a good story”, “eggs in house” “this outside” are classified as having a subject despite the fact that they do not have verbs. wh-questions lacking a verb but containing a wh-word plus object were included in the numerator. Throughout this process, the parent’s response was used to resolve difficult cases.

II) Subject Appearance in Utterances with Verbs: The denominator consisted of all non-imitative, non-imperative usable utterances with verbs, including questions. The numerator consisted of the subset containing subjects.

III) Pronominal Subject Use:

III)’ Total subject pronoun use

The denominator consisted of all utterances including a verb and including a subject. The numerator consisted of all subject pronouns in those utterances, including personal pronouns, demonstrative pronouns (“this”, “that”, etc.) and interrogative pronouns (“who”, “what”, etc.)

III)'' Total subject pronouns, excluding interrogatives (used for American children only)

This was used for the sake of ensuring that wh-questions were not skewing the results. Therefore, the denominator consisted of all utterances including both a verb and a subject, the numerator consisted of all subject pronouns including personal and demonstrative pronouns.

The results showed that for American children, the percentage increased from 23% (Group I) to 50% (Group II) and to 68% (Group III) and to 77% (Group IV)

Results for American Children:

For the subject use, Measure II was used. Here, the denominator = non-imitative, non-imperative usable utterances with verbs including questions; The numerator = utterances containing subjects.

For the PS use, the PS% was the percentage of +V utterances containing a pronominal subject.

There is a clear increase in percentage of subject use between Group I and Group II. Performance was consistently high thereafter, increasing slightly in the next two groups. As for the pronominal subject use, at every MLU group, pronouns were the majority of children's subjects, whether Measure I or Measure II was used.

The parental use of subjects was coded to determine what the input to the child is. In that calculation, only non-discards, non-imitative, and non-imperative utterances with verbs were included. The parents were very consistent in subject use and the mean percentage of subject use of usable⁶ parental replies was 97%.

⁶ In coding the adult's speech. Valian used the parental replies only; in my study, I used all the caregivers' speech.

Results for Italian Children:

In the Italian study, with regard to the appearance of subjects in utterances containing verbs, the results were completely different from those of the American children. From Time I to Time II the rate stays at 30%, less than half the average usage of Group I in American children. The Italian children differ from American children in producing few subjects and in showing no increase in production within the time period sampled. They also differed in producing less than half as many pronominal subjects as the Americans. It is noticeable that at Time I, 22% of the Italian children's subjects were pronouns, and at Time II 35% were pronouns.

Thus, Italian children's utterances look very different from those of the American children. From 1;6 to 2;6, they use pronoun subjects as a minority of their subjects (20%-35%) and they include subjects in a relatively small portion of their +V sentences. In contrast, American children include subjects in a majority of the +V sentences. Moreover, they show a similar pattern in the pronoun use over time, i.e. American use of PS increases from 73% to 86% from Group I to Group II, and Italian use increases from 22% to 35%.

The prediction of the performance theory that American children will use subjects more than Italian children do is therefore confirmed. In addition, another performance prediction that children are neutral about the role of input is indirectly confirmed by the comparative study of Valian (1991) and Bates (1976) arguing that neither Italian nor American children produce subjects at the same rate that adults do.

Valian's (1991) findings concerning verbs, direct objects and subjects support the performance account from another perspective. The performance account also predicts that there will be an increase of transitive verb use and the objects of "mixed" verbs as age and MLU increase. According to Valian (1991), transitive verbs = verbs for which objects are obligatory; "mixed" verbs = verbs that are grammatical with or without an object. For that purpose, the same corpora from Study I of American children were used. This time, utterances with modals, negatives, imperatives and imitations were excluded. As explained

above, verbs were divided into three categories: pure transitives, pure intransitives and “mixed” verbs.

As is predicted by the performance account, there is a positive relationship between verb use and MLU, and the children produced more purely transitive verbs as development proceeded. Also, they were constant in their use of objects for pure transitives or intransitive verbs⁷, but slightly increased their use of objects for “mixed” verbs. That is to say they provide objects much more frequently for pure transitive verbs than mixed verbs, indicating that they recognize the difference between when an object is obligatory and when optional.

To sum up, in the comparative study of children of NSL (Italian) and NNSL (English) by Valian (1991), it is demonstrated that American children between MLU 1.5 and 2.0 (1;10-2;2) use subjects in almost 70% of their utterances with verbs and between 2.0 and 3.0, subject use averages 90%, and that around MLU 2.0, they know subjects are required. Secondly, Group I American children produced twice as many subjects as Italian children (2;1-2;5), disconfirming the pro hypothesis in Hyams (1986). They used more PSs than NPs, contrasting with Italian children, who used PS for only a minority of their subjects.

In her study of Portuguese, Valian et al (1995) audiotaped and analysed the spontaneous speech of 20 Portuguese speaking two-year-olds and their adults. They were divided into three groups with MLU 1.5-1.99; 2.0-2.99 and 3;0-4.99 respectively, in order to facilitate comparison with earlier data from American children and with data from the Portuguese-speaking adults in this study.

The results show that as MLU increases, so did the children’s use of verbs. In Group I, a mean of 36% of all usable clauses included a verb, in Group II, 56%, and in Group III, 72%. The Group III children and the adults use verbs to the same extent. The children’s

⁷ In Valian 1991, examples such as “He, he talking a duck,” “go school”, “it look a lady” are treated intransitives having objects. In my study, I excluded such examples.

use of subjects increased from a mean of 28% of all clauses with verbs in Group I to 38% in Group II to 57% in Group III. The average use of subjects by the adults was the same for each group. It is also shown that the percentage of subject positions occupied by full lexical NPs changes little as MLU increases. In contrast, the percentage of positions occupied by pronouns increases considerably across groups. In Group I 18% of all subject positions are pronouns, in Group II, 28%, and in Group III, 43%. The adult percentage is 44%. Therefore, the children in Group III are almost identical to the adults. The increase of subjects is due to a trade-off between null subjects and pronominal subjects---null subjects decrease with development, becoming expressed as pronouns.

The basic findings were that MLU and verb use were positively correlated with overall subject use and the age and verb use were positively correlated with pronominal subject use.

The comparison of Portuguese and American children shows that both groups increase their use of verbs, subjects and pronominal subjects with increasing MLU. Thus, an increase in the use of subjects occurs not just in a non-null subject language like English, but in a null subject language like Portuguese as well.

The pattern that Portuguese-speaking children increase their use of subjects in general and their use of pronominal subjects in particular duplicates the pattern shown by American children (Valian, 1991). And children of both languages also show a positive relation between subject use and MLU and between subject use and verb use. In both language groups, most of the increase in subject use is an increase in pronominal subjects.

Valian's data suggest that all children, regardless of their target language, will increase their use of subjects as development proceeds.

Valian (1996) used an elicited imitation technique to test 19 English-speaking children aged from 22 to 32 months, split into two MLU groups (above & below MLU 3, respectively.). As would be predicted on the basis of prior work, children below MLU 3 imitated the subject of a specified topic at a lower rate compared with children above

MLU 3. This confirms Valian's previous research, arguing that by MLU 3(2;0) , American children know that their language requires subjects. The fact that children below MLU3 imitated subjects from short sentences more often than they imitated subjects from long sentences while the older children showed no difference in this respect also confirmed the performance hypothesis.

In sum, the studies by Valian and her colleagues give two strong arguments in favor of a performance account of subject drop by children speaking English-type languages. First, English speaking children produce more subjects than children speaking pro-drop languages do, and second, children speaking both types of languages produce more pronoun subjects as their age/MLU increases. The second finding is particularly important: the increase in pronoun use by English-speaking children cannot be attributed to the resetting of the pro-drop parameter.

Chapter 4: Null Subject and Object in Child Chinese

4.1. Research Questions

This study will address the following two questions: 1. Is it the case that Chinese speaking children will, like Portuguese speaking children, show more use of pronouns with age? 2. Will subject and object be differentiated with respect to pronoun use? The answers lie in the analysis of the relevant data.

4.2. Data and Methodology

In this study, the data of children recorded by Twila Tardif and her colleagues will be used. These children were recorded in Beijing, between August, 1991 and January, 1992, and the data were transcribed by Tardif and her students, who are native Beijingers, in 1993. The data is available on the CHILDES database (MacWhinney, 1993). I have selected five children, aged between 20 and 22 months at the beginning of the study; their parents are native speakers of Mandarin classed by Tardif as intellectuals (i.e. their education was college level). The “intellectual” children have been selected from the Tardif corpus as socially most comparable to the children in the studies by Valian cited above. The children and their ages at the first and the fifth visits are listed below (Table 1)

Child	Gender	Visit 1	Visit 5	Social Class
BB	M	1;10.12	2;2.7	Intellectual
HY	M	1;9.10	2;1.4	Intellectual
LXB	F	1;9.3	2;1.9	Intellectual
WX	M	1;9.27	2;1.20	Intellectual
YY	M	1;10.20	2;2.18	Intellectual
MEAN		1; 9.26	2;1.24	

Table 1. Five Children's Ages of Different Visits

The families were told that the researchers were interested in child language development and wanted to collect data which were as naturalistic as possible by recording the children in interaction with whomever they normally interacted. The caregivers were not informed that the study was also concerned with the effects of adult speech on children's language acquisition until the very end of the investigation. Tardif et al (1997) aimed at examining the naturalistic samples of adult-to-child speech to determine if variations in the input are consistent with reported variations in children's nouns and verbs in their early speech.

The activities that the children and the caregivers participated in included the normal activities including indoor toy play, watching television, cleaning up, feeding, talking and playing with neighbors, and also a trip to a local amusement park. The tapes were transcribed into the pinyin romanization system by trained native Beijing university students, who were asked not only to carefully write down the words they heard but also pay attention to who the speaker and intended listener for an utterance were. Utterances boundaries, changes in loudness, any errors, mispronunciations or dialect words, pauses and interruptions were also noted on the transcriptions.

The children's MLU (Mean Length of Utterance) at the different visits (visit 1 & 5, respectively) are illustrated in Tables 2. For each child's MLU, the denominator is the total number of all the utterances, the nominator is the total number of all the morphemes.

Child	Visit 1	Visit 5
BB	1.789	2.475
HY	1.549	2.288
LXB	2.339	2.529
WX	1.915	2.720
YY	2.357	3.194
Mean	1.990	2.641

Table 2. Five Children's MLUs

Valian's (1991) study investigated American children of MLU 1.53-4.38 cross-sectionally and Italian children aged 1;6/7 to 2;5/6 longitudinally (MLU was not calculated for the Italian children). The Italian children were divided into two levels at the mid point of the recording; the age range for the first level was 1; 6-1;10 and for the second level the range was 2;0-2;5. The overall range was thus wider in that study than for the Chinese children. In Valian (1995), the spontaneous speech of 20 Portuguese- speaking children aged 2;0-2;10 (MLU 1.58-4.75) was examined. Among the three age groups in her study, children in Groups one and two (mean MLU1.71-2.43) match the children in this study most(mean MLU1.99-2.64). The five Chinese children described above, BB, YY, LXB, WX and HY, were chosen for this analysis because their MLUs at the first session were exactly in the range of the Portuguese children, and all of them showed an MLU increase in the last session similar to that for the Portuguese children.

In this study the main factors to be analyzed are the amount of null subjects and objects and the amount of pronominal subjects and objects.

4.3. Results

The data for the five children for the two different visits were coded. Table 3 gives the total number of utterances, and the proportion and number of +V utterances per visit.

	Child	No. total utterances	No. +V utterances	Proportion +V utterances
VISIT I	YY	194	86	44
	BB	107	53	50
	WX	72	55	76
	LXB	95	88	93
	HY	156	149	95
Mean		125	86	72
VISIT V	YY	182	79	43
	BB	480	386	80
	WX	247	246	99
	LXB	131	125	95
	HY	147	144	98
Mean		237	196	83

Table 3 Chinese children: Utterance Information

Figure 1 shows the proportion of subject, object and pronoun use (total S, total O, total PS and total PO) for the two visits, for all five children combined. The denominator of total subjects equals the number of all the non-imperative non-imitative utterances with subjects which contain verbs. Total pronouns are a subset of total subjects. This method also applies to the calculation of the null objects. Figures 2-6 give the data for each individual child, broken down into percentage null, pronominal and NP subject and object use per visit.

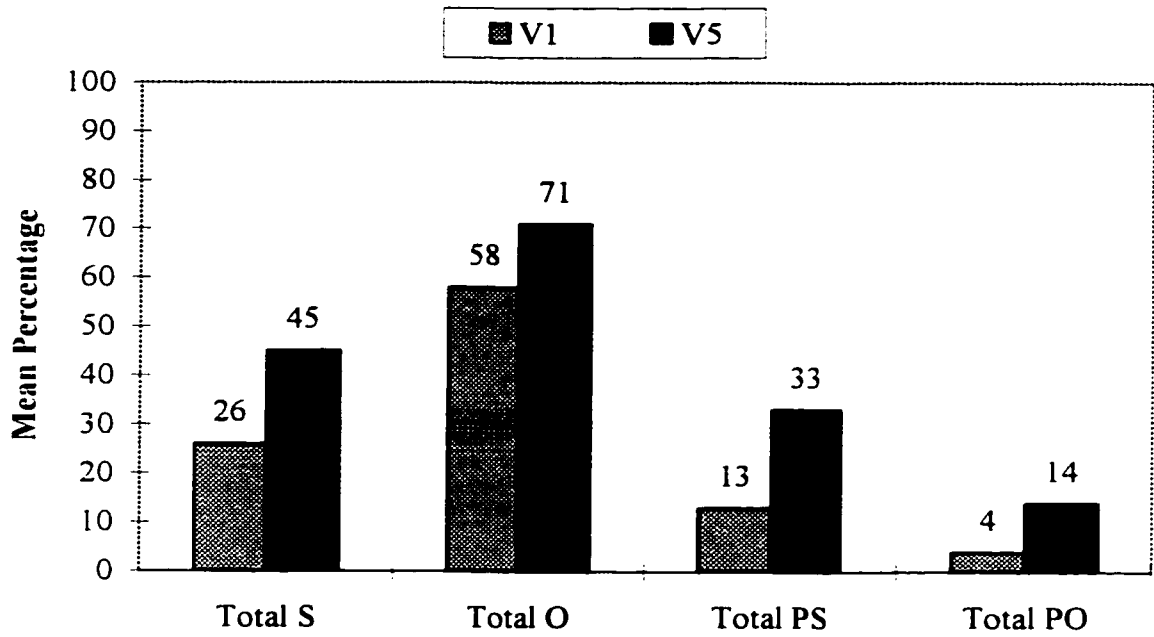


Figure 1 Mean Percentages, CHILDREN (n=5)

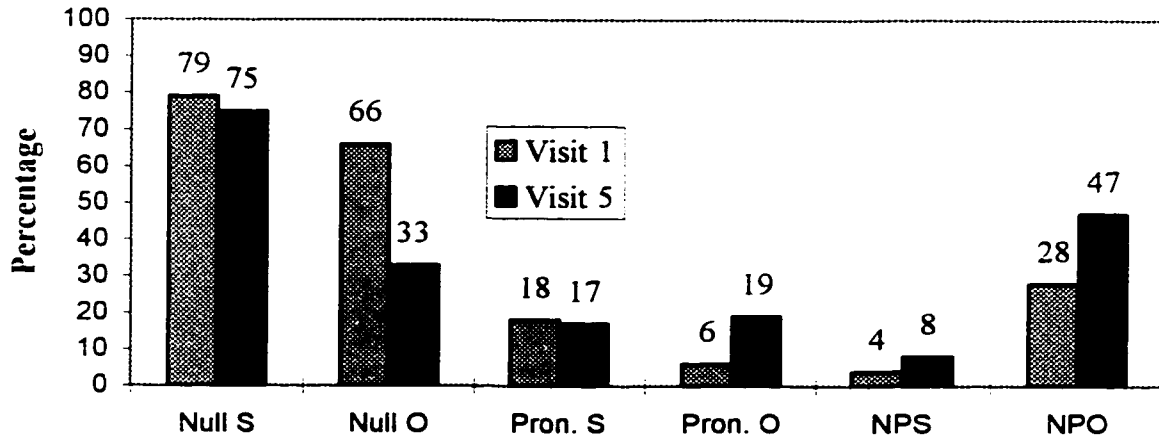


Figure 2. Results for BB (CHILD)

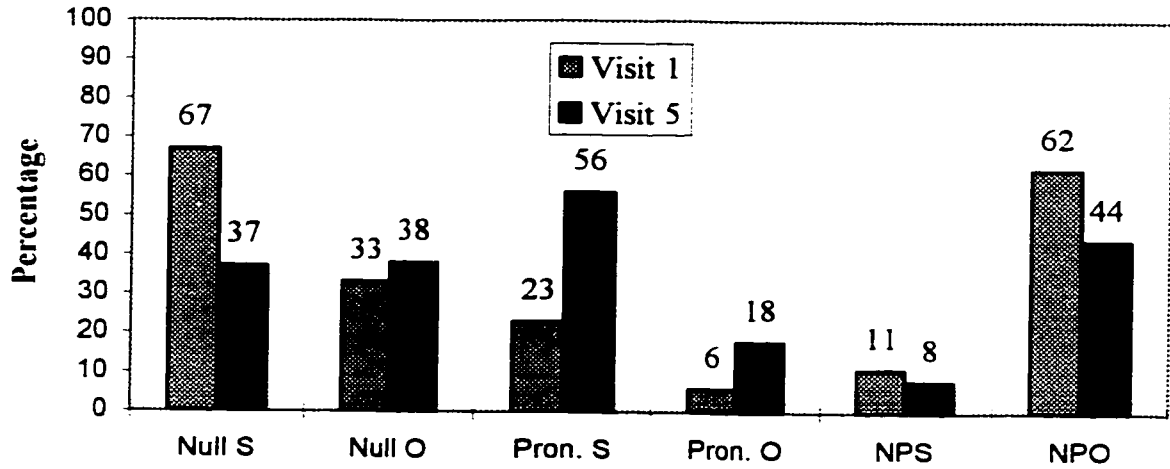


Figure 3. Results for YY (CHILD)

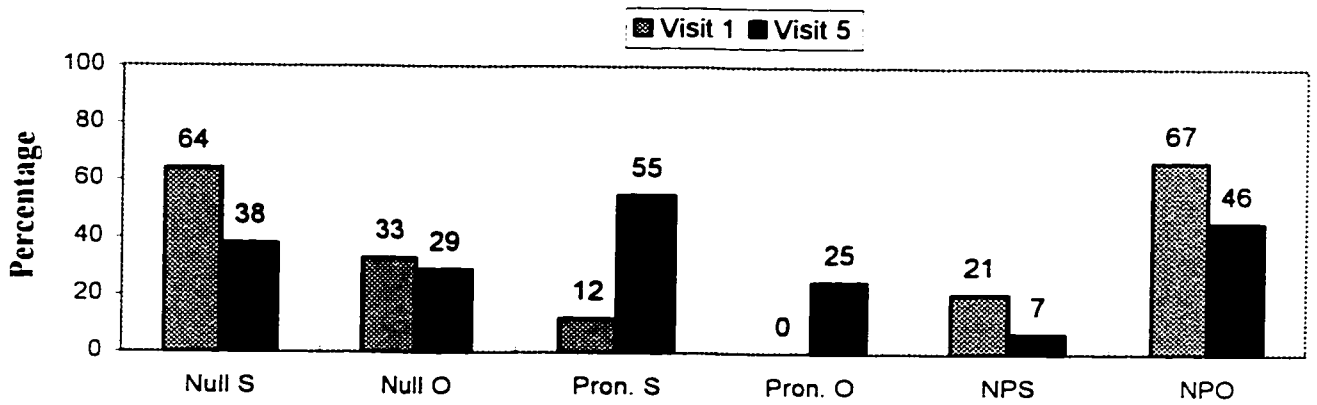


Figure 4 LXB CHILD

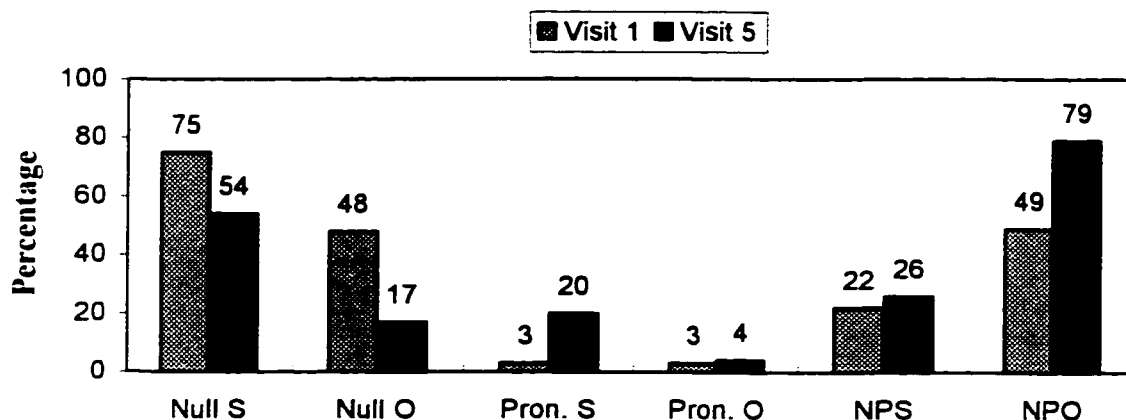


Figure 5 WX CHILD

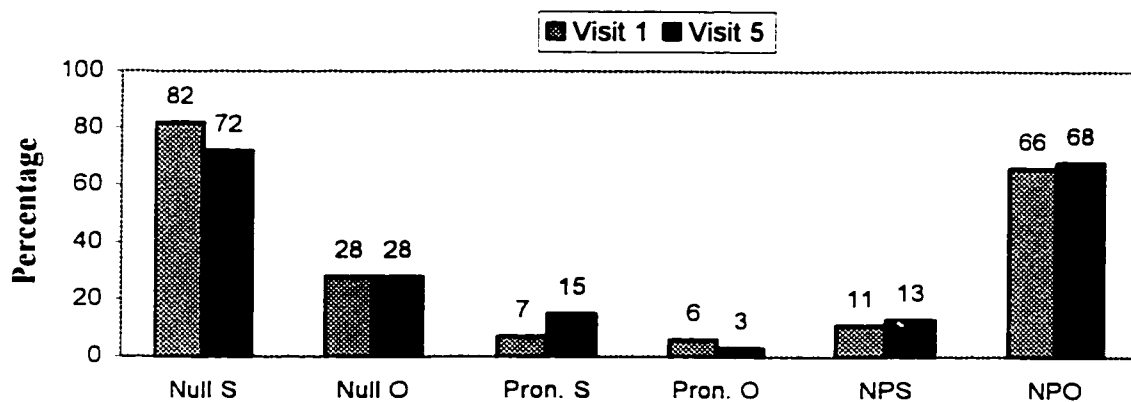


Figure 6 HY CHILD

As seen in Figure 1 the mean percentage of total S increases from 26% to 45%. Total O increases from 58% to 71%. The Wilcoxon signed ranks test rejects the null hypothesis that total subject use does not differ for the two visits ($p < .05$, 1-tail), but does not reject the hypothesis that total object use differs. Five out of five children showed an increase in total subject use at the second visit (although for one child the increase was minimal), and a corresponding drop in use of null subject. Three out of five children showed an increase in total object use, and a corresponding drop in null object use. The other two children showed minimal differences in object use between the two visits.

Let us compare the children's subject and object use with that of the adults. Figure 7 shows the total subject and object use and pronominal subject and object use by adults for the two visits. As described before, the adults who interacted most often with the children have been chosen for this study. Thus, for each individual child, there may be one or more than one adult chosen (WX1 FA; WX5, FA; LXB1, MO; LXB5, MO; HY1, MO; HY5, MO; BB1, MO; BB5, NN; YY1, BM; YY6, MO.) Figures 8-12 show the breakdown for each adult. As can be seen from Figure, changes in the use of subjects and objects are minimal for the adults, and non-significant by the Wilcoxon signed ranks test.

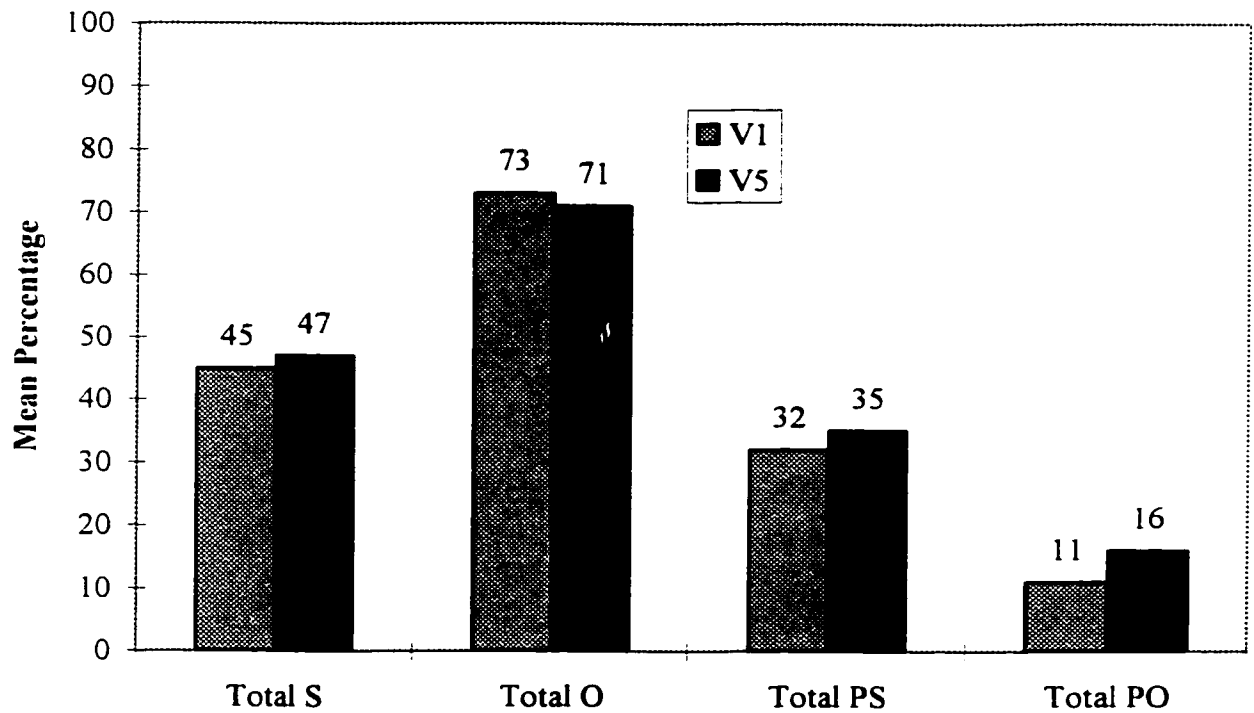


Figure 7 Mean Percentages, ADULTS (n=7)

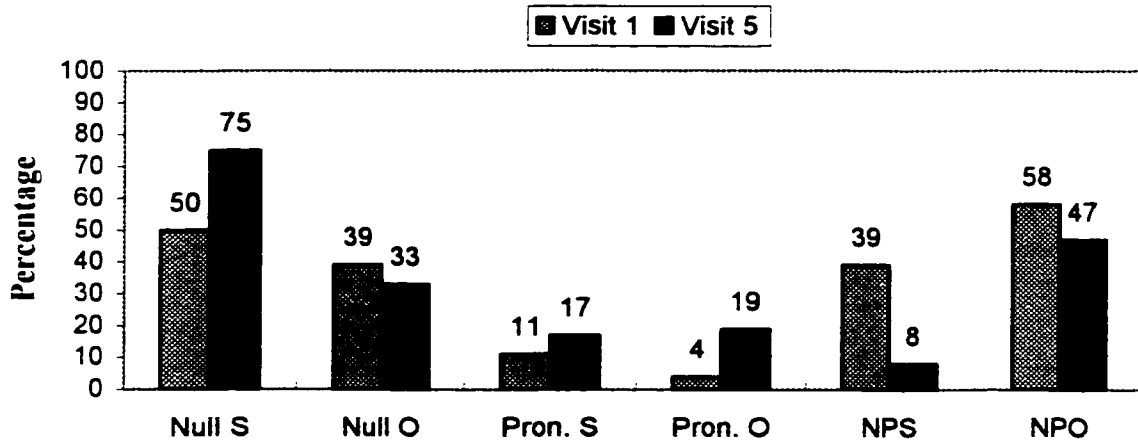


Figure 8 BB MOTHER

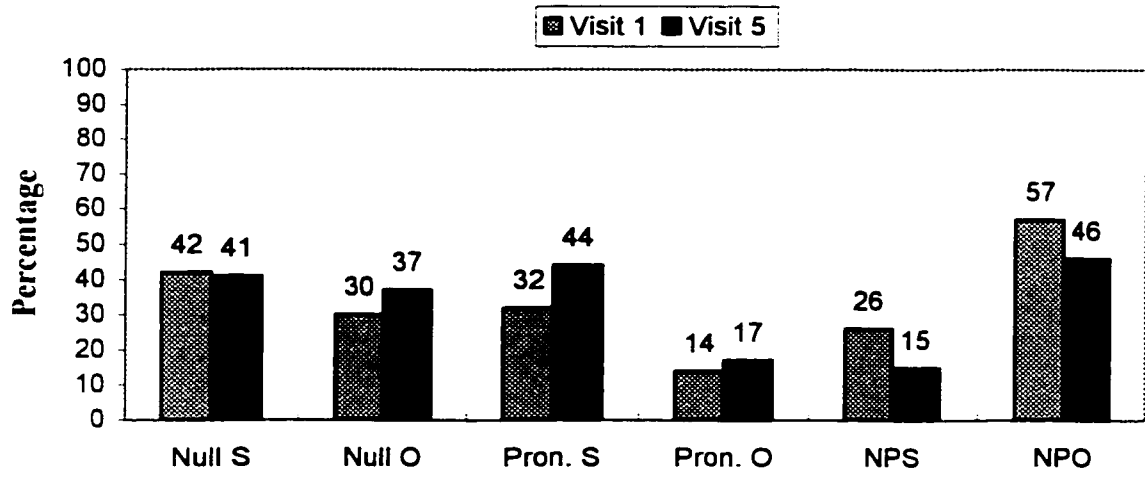


Figure 9 YY BM, MO

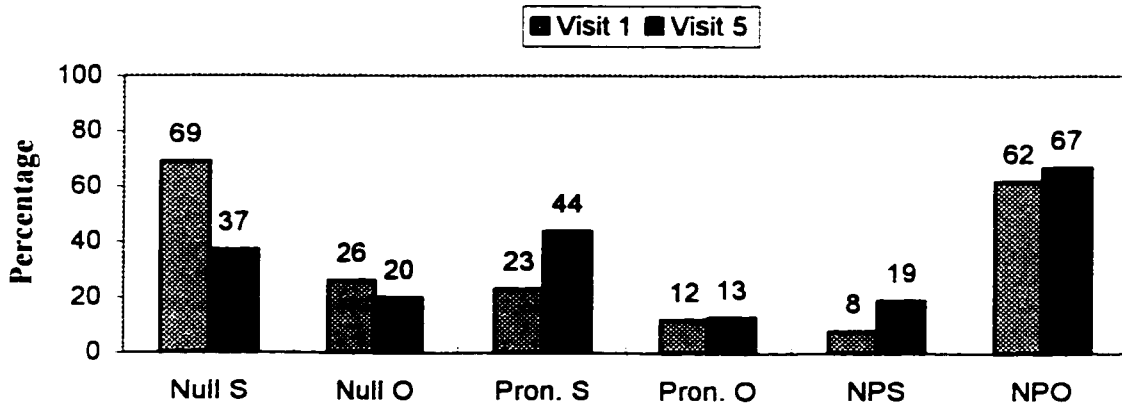


Figure10 WX FATHER

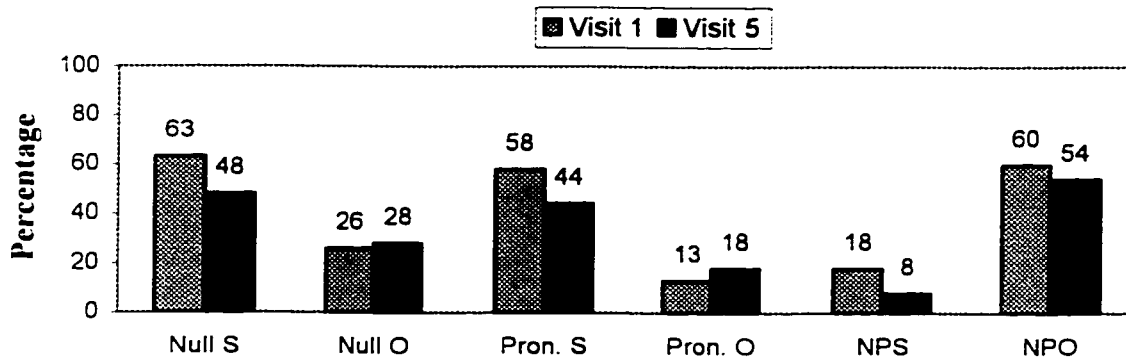


Figure 11 LXB MOTHER

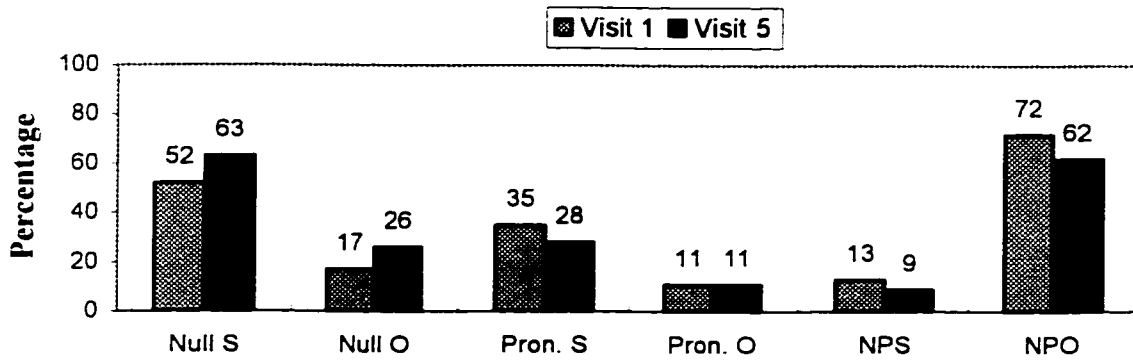


Figure 12 HY MOTHER

The correlation between child and adult total subject use at visit 1 is very low ($r=.12$), increasing to a fairly high correlation at visit 5 ($r=.81$, $p>.05<.10$, 2-tail). Similarly, for pronoun subjects the correlation is negligible at visit 1 ($r=-.025$), but moderately high at visit 5 ($r=.67$). For objects, the picture is different. For total objects the correlation is quite high at visit 1 ($r=.80$, $p>.05<.10$), increasing to a close to perfect correlation at visit 5 ($r=.94$, $p<.02$). For pronoun objects the correlation is low at visit 1 ($r=-.30$), but rises to virtually perfect at visit 5 ($r=.99$, $p<.001$).⁸

The types of pronouns used by the children and the adults were also analyzed. The results are given in Table 4:

Subject	1ps	1pp	2ps	2pp	3ps	3pp
Child YY1	44	0	0	0	0	0
Adult YY1	0	30	29	12	40	0
Child YY5	58	23	4	10	2	4
Adult YY5	24	47	32	41	46	8
Child BB1	18	1	0	0	0	0
Adult BB1	15	21	10	12	24	5
Child BB5	42	10	11	8	7	5
Adult BB5	20	35	31	20	7	20
Child WX1	2	0	0	0	0	0
Adult WX1	4	8	11	5	2	1
Child WX5	31	4	8	5	2	0
Adult WX5	36	68	87	22	30	22
Child LXB1	11	0	0	0	0	0
Adult LXB1	11	21	12	14	0	2
Child LXB5	48	10	7	4	2	1
Adult LXB5	23	38	16	27	12	15
Child HY1	11	0	0	0	0	0
Adult HY1	28	31	44	22	14	8
Child HY5	21	1	0	0	0	0
Adult HY5	21	32	33	10	0	4

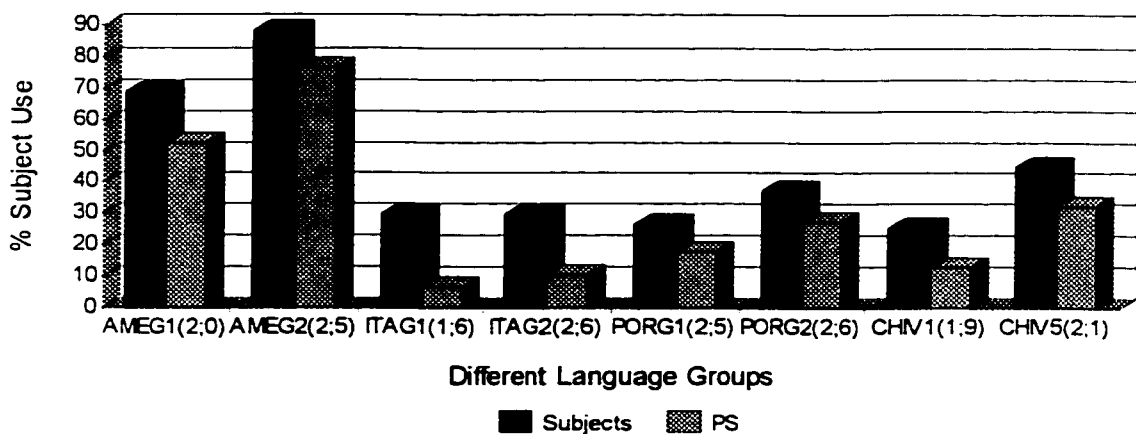
Table 4 Pronoun Use of Children and Adults

⁸ At the point of lodging this thesis, an analysis of adult MLU and verb use has yet to be completed. When this analysis is complete, a full analysis of simple and partial correlations will be done

From this table we can see that for all of the children during the first visit, all but one of the pronominal subjects are represented by the first person singular “I”. And for the children during the second visit, first person singular still accounts for 61% (200/328) of pronoun use, compared with 15% (124/827) for adults.

Chapter 5 Discussion and Conclusion

The basic finding of this study is that Chinese speaking children increase their use of subjects as they get older, and their use of pronominal subjects in particular. Thus, a similar pattern is found for Chinese to the pattern Valian found for Portuguese. Figure 13 (revised from Valian 1991) shows the results from Chinese in comparison with the results from English, Italian and Portuguese.



Cross linguistic comparison of children's production of subjects and pronominal subjects

Figure 13

For three out of the four languages (English, Portuguese and Chinese) there is an increase in subject use and in pronominal subject use over time. This increase provides support for the performance deficit account. The fact that both Portuguese and Chinese children show the trade-off between pronominal subjects and null subjects supports the view that children increase their use of subjects and decrease their use of null subjects not because that they are changing from a NSL to a NNSL, as both Portuguese and Chinese are NSLs. The fact that there is an increase of subjects for both NSL children (Chinese & Portuguese) and NNSL children (English) argues that there is no change in grammar of the kind proposed

under competence deficit accounts. Instead, our data show that children of all language groups know whether or not their language licenses *pro*. In addition, the greater use of subjects by American children as opposed to Italian, Portuguese and Chinese children argues that at an early age children know whether their language is a null subject language or not. The analysis of the Chinese caregivers' speech indicates that the Chinese children's increase in subject use does not reflect a parallel change in the pattern of the adults, who do not as a group show any change in subject use.

This study is not the first to examine Chinese speaking children's use of null subjects and objects. Wang, Lillo-Martin, Best and Levitt (1992) used an elicited production task with nine Mandarin speaking children and nine English speaking children, who were older than those in this study and the other studies discussed above (2-4 years, MLU approximately 3-4/5). Overall, the Chinese children's null subject use declined from approximately 50% to approximately 40% with age, while their null object use remained stable at approximately 20%. The younger American children used approximately 20% null subjects, falling to less than 10 percent for the older children. There was almost no null object use. Wang et al. contend that performance based accounts of null subject and object use cannot accommodate the universality of null subject in comparison with null object (p.247), and that there is a genuine null subject stage for learners of English. This reasoning does not seem to us water-tight. While performance factors themselves may not predict the subject-object asymmetry found, other factors outside the theory of grammar may do so. In particular, subjects may be more predictable than objects, and thus more prone to dropping. In this regard, it is notable that when we examine the patterns of individual children's null, pronominal and NP subject and object use in this study (Figures 2-6 in chat. 4), we see that in the case of subjects, the amount of pronoun subject use is greater than or equal to the amount of full NP subject use, The reverse is true for objects: for every child there is substantially greater NP object use than pronoun object use.

Valian's 1991 study of Italian children involved the same number of children (5) as this study and both are longitudinal. The amount of data (utterances) was less for the Italian children than the Chinese children as can be seen by comparing Table 5 with Table 3,

chapter 4). MLU was not calculated for the Italian children, but as noted in chapter 4, the age range for the Chinese children falls in the middle of the range for the Italian children. One obvious difference between the Italian and Chinese children is that the Chinese children use many more +V utterances. The linguistic and social interaction factors that may account for this are thoroughly discussed in Tardif et al (1997).

In Valian's study (1991), unlike in the Chinese data reported here, there was no increase in subject use over time. Why should the Chinese but not the Italian children show an increase in subject use? Valian suggests that Italian children do not show a significant increase of subjects due to a limited number of utterances and a relatively short period of time (one year). But with the same number of the children, a similar number of utterances and a shorter time span (five months), there is an increase in Chinese children's subject use. Let us assume that this difference between the results of the two studies of naturalistic speech is not an accident of data collection. What possible source or sources could this difference have?

	Child	No. total utterances	No. +V utterances	Proportion +V utterances
Time I	E	119	43	.36
	O	133	32	.24
	M	168	42	.25
	G	139	41	.29
	D	192	39	.20
Mean		150	39	.27
Time II	E	164	55	.34
	O	196	83	.42
	M	219	86	.39
	G	211	84	.40
	D	220	84	.38
Mean		202	78	.39

Table 5 Italian Children: Utterance Information

There are two possible reasons why subject use might increase more rapidly in Chinese than in Italian. The first possible explanation concerns the information value of an overt

pronoun. Tardif et al (1997) examined the rate of overt pronoun use of adult speakers of Mandarin addressing children and adult speakers of Italian addressing children. (The Mandarin children were the complete group of 10 children at Visit I in the Tardif corpus from which the data analyzed in this study is taken). Tardif et al found that adult speakers of Mandarin used more overt pronouns than Italian adults did. They propose that “[Mandarin] probably uses more pronouns than Italian because Italian has verbs that are already marked for person and number, whereas this information is completely absent in Mandarin if the subject is dropped” (p. 555). It is tempting to say that the reason that Mandarin children, but not Italian children, show an increase their use of subjects in the longitudinal data is the same as that proposed by Tardif et al for the difference in overt pronoun usage among speakers of the adult languages. But consider the data concerning the types of pronouns used by children and adults presented in the last chapter. Adults used a range of different pronouns, so their pronoun use can be considered to fulfill the information function suggested by Tardif et al. By contrast, overt pronouns used by children are almost invariably first person singular at visit 1 and are still predominately so at visit 5. Notice that one child (HY) almost doubles his first person singular pronoun use from visit 1 to visit 5, without showing any use of other pronouns. And WX also shows a large increase in first person singular pronoun use (two instances at visit 1, 31 at visit 5), with only a relatively small amount of use of other pronouns (0 instance at visit 1, a total of 19 at visit 5). If a child’s use of pronouns is almost invariably first person singular, it seems then that there is relatively little information value associated with the child’s use of an overt pronoun. This suggests that children’s increase in pronoun use may be an adaptation towards the general level of pronoun usage in the adult language that operates at a level distinct from what the communicative value of an overt pronoun is.

A second type of reason for Chinese children’s increased subject use may come from syntactic theory. Recall that Huang (1984, 1989, 1993) argued that in Chinese only the EC which is in the subject position of an embedded clause can be pro, all other ECS (objects and matrix subjects) being variables, bound by a null discourse topic. As a result, not all matrix subjects can drop freely. Possibly the more complex syntax of null matrix

subjects in Chinese as compared to Italian in Huang's analysis causes the child learning Chinese to avoid null subjects.

To sum up, all the findings of the current studies on null subject and object in child speech support the view that performance accounts overrule competence accounts, although grammatical factors may also play a role in determining the distribution of null elements in child Chinese.

References

- Authier, J. -M. (1989) "Arbitrary Null Objects and Unselective Binding", in Jaeggli and Safir (eds), *The Null Subject Parameter*, 45-67.
- Bloom, P. (1993) "Grammatical Continuity in Language Development: The Case of Subjectless Sentences" *Linguistic Inquiry*, 24 .721-733.
- Chomsky, N. (1969) *Syntactic Structures*, Mouton, The Hague, Paris.
- Chomsky, N. (1982) *Some Concepts and Consequences of the Theory of Government and Binding*. MIT Press. Cambridge, Massachusetts.
- Chomsky, N. (1981) *Lectures on Government and Binding, The Pisa Lectures*. Foris Publications, Dordrecht-Holland/Cinnaminson.
- Guilfoyle, E. (1984) "The Acquisition of Tense and the Emergence of Lexical Subjects in Child Grammars of English". *Boston University Conference on Language Development* , Boston.
- Haegeman, L (1994) *Introduction to Government and Binding Theory*, Oxford UK & Cambridge USA, Blackwell Press.
- Huang, C.T.J. (1982) "Logical Relations in Chinese and the Theory of Grammar", Doctoral Dissertation, MIT.
- Huang,C.T.J. (1984) "On the Distribution and Reference of Empty Pronouns" *Linguistic Inquiry* 15, 531-574.
- Huang, C.T.J. (1984) "Pro-drop in Chinese: A Generalized Control Theory" *The Null Subject Parameter*, Edited by Jaeggli & Safir, Kluwer Academic Publishers.
- Hu, Y. (1991) *Modern Chinese (Xiandai Han YU)*, Shanghai, Shanghai Educational Press.

Hyams, N. (1986) *Language Acquisition and The Theory of Parameters*. Dordrecht: Reidel.

Hyams, N. (1989) "The Language Subject Parameter In Language Acquisition" *The Null Subject Parameter*, Edited by Jaeggli and Safir. Kluwer Academic Publishers.

Hyams, N. & Wexler, K. (1993) "On the Grammatical Basis of Null Subjects in Child Language, *Linguistic Inquiry*, 24, No.4. 421-459.

Jaeggli, O. & Safir, K.J. (1989) "The Null Subject Parameter and Parametric Theory *The Null Subject Parameter*, Edited By Jaeggli & Safir. Kluwer Academic Publishers.

Kazman, R. (1988) *Null Arguments and the acquisition of Case and Infl*. Boston University Conference on Language Development, Boston.

Lillo-Martin, D. (1986) "Effects of the acquisition of morphology on syntactic parameter setting", In proceedings of NELS 16, 305-321. GLSA

MacWhinney, B. *The CHILDES Database: Second Edition*, Dublin, Discovery Systems.

Massam, D. (1992) "Null Objects and Non-Thematic Subjects" *Journal of Linguistics* 28,115-137, Cambridge University Press.

Raposo, E. (1986) "On the Null object in European Portuguese "in Jaeggli and Silva-Corvalan (eds), *Studies in Romance Linguistics*, 373-90.

Rizzi, L. (1986) "Null objects in Italian and the theory of pro", *Linguistic Inquiry* , 17, 501-58

Tardif, T., Shatz, M. & Naigles, L. (1997) "Caregiver Speech and Children's Use of Nouns Versus Verbs: A Comparison of English, Italian, and Mandarin, *Journal of Child Language*, 535-565"

Valian, V. (1991) "Syntactic Subjects in the Early Speech of American and Italian Children" *Cognition*, 40, No1-2, 21-81.

Valian, V. & Eisenberg, Z. (1995) "The Development of Syntactic Subjects in Portuguese-Speaking Children", *Journal of Child Language* Cambridge University Press

Valian, V. et al. (1996) "Young Children's Imitation of Sentence Subjects: Evidence of Processing Limitations", *Developmental Psychology*, 32, 153-164.

Wang, Q. & Lillo-Martin, D et al. (1992) "Null Subject Versus Null Object: Some Evidence From the Acquisition of Chinese and English", *Language Acquisition*, 2, 221-254.

Xu, L. & Langendoen, D.T. (1985) "Topic Structures in Chinese," *Language* 61, 1-27.

Xu, L. (1986) "Free Empty Category, *Linguistic Inquiry*", 17, 75-93.

Appendix One

Null Subject and Object Use of Children and Adults

BBVIS 1 CHILD NS-PS

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1				30	7		
2	1	1		31	4		
3	1			32	8		
4				33	1		
5	1	2		34	7	3	
6	2			35			
7	1	1		36			
8	3			37	3		
9				38			
10	2			39	2		
11		1		40			
12	1			41			
13	1		1	42	1		
14				43			
15	3			44			
16	2	1		45			
17	3	1	1	46			
18	3	2		47	5	1	
19	3		1	48			
20	1	1		49			1
21				50	1	1	
22	4			51	3		
23				52			
24		1		53			
25				54	4	1	
26				55	2	1	
27				56	2		
28	1	1		57	1		
29	1			58			
				Total	84	19	4
				%	78.5	17.8	3.7

BBVIS 5 CHILD NS-PS

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1	2	4	1	33	4		5
2	6	1	1	34	5	1	1
3	6	2		35	5		1
4	9	5		36	3	2	2
5	3	1	2	37	4		1
6	5			38	5	1	
7	5	1		39	2		
8	11			40			
9	14			41	3		
10	9	3	3	42	4		
11	7			43	2	3	
12	8	4	1	44	4		1
13	2	5	1	45	6		1
14	6	1		46	4		2
15	10	2	2	47	9	1	
16	1			48	7	6	
17	7			49	6		1
18	8	4		50	2		
19	6	3		51	3		
20	3		1	52	8	1	
21	12	2		53	2		
22	13			54	1	2	
23	9	5		55	3	2	2
24	5			56	9	1	1
25	7			57	4	1	
26	12	3		58	6		3
27	9	2		59	11	1	
28	7	2		60	3	4	
29	1	1		61	5	1	
30	6	3	1	62	3	2	1
31	10			63	4	1	
32	5	1					
				Total	361	83	36
				%	75.21	17.3	7.5

BBVIS 1 CHILD NO-PO

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1				30	2		1
2		1		31			
3				32	4		4
4				33			
5				34		1	
6	2			35			
7	1			36			
8	1		2	37			
9				38			
10	1	1	1	39	1		
11				40			
12	1			41			
13	1			42	1		
14				43			
15	3			44			
16	1			45			
17	2			46			
18	3			47	1		
19			3	48	2		1
20				49			
21				50	1		
22	2	1		51			
23				52			
24				53			
25				54	1		
26				55	3		
27				56			2
28				57	1		
29			1	58			
				Total	35	3	15
				%	66	5.7	28.3

BBVIS 5 CHILD NO-PO

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1	3		2	33	1		8
2			6	34	3	1	2
3	4	2	2	35	2		2
4	6	4	1	36	2		3
5	2		2	37		1	1
6	3			38	1	1	1
7	2	3		39			
8	5	6		40			
9	7	3	4	41	2		
10	4	2	6	42	1		2
11	1	2	4	43		2	
12	1	1	7	44	3	2	
13	5	1	2	45	3		
14	2		2	46	1		1
15		3	7	47	6		4
16			2	48	1		3
17	3	2	1	49	1		3
18	4	2	4	50			1
19	3	4	2	51	2		1
20	2			52	3		6
21	2	1	7	53			
22	4	4	4	54			1
23	7		4	55	4		1
24	2		3	56		2	9
25	2		5	57		2	4
26	4	6	4	58	1		8
27	1	6	3	59	3	1	9
28	3	4	1	60			5
29				61			4
30	1	3	4	62		1	5
31	2	3	3	63			4
32	3		3	Total	128	75	183
				%	33.2	19.4	47.4

BB1 MO NS-PS

Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)	Page	Null (1- ϕ)	pro (ϕ -1)	np(ϕ - ϕ)
1	6	3		32	4		8
2	12	2	13	33	7	2	4
3	6	1	7	34	14	5	7
4	7	2	7	35	5	1	15
5	13	2	4	36	11	3	4
6	12		5	37	6		4
7	6		3	38	8	1	5
8	8		8	39	13	4	3
9	13	1	11	40	4	2	2
10	6	3	9	41	10	3	3
11	7	1	12	42	8	1	4
12	11	3	8	43	5	2	7
13	11	1	15	44	8		6
14	4	3	6	45	5		1
15	1	1	2	46	1		1
16	2		2	47	9	1	7
17	4	1	8	48	8	4	8
18	3	1	2	49	7	3	1
19	8		2	50	4		1
20	6	1	12	51		1	7
21	4	1	1	52	4		4
22	8	2	6	53	3	1	
23	11	1	5	54	5	1	2
24	4	2	4	55	3	3	5
25	12	2	3	56	6		5
26	11	5	6	57	6	3	4
27	18	1	4	58	4	1	
28	5	1	8				
29	5	4	9	Total	403	90	314
30	7		10	%	50%	11%	39%
31	4	3	4				

BBS NN NS-PS

Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)	Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)
1	4	1	4	34	4	1	1
2	1	2	2	35	1	2	3
3	4	3	4	36	3	6	1
4	9	2	4	37		2	
5	9	3	2	38	5	1	1
6	13	3	2	39	6	2	
7	7	4	3	40	4	3	
8	7	13		41	2	4	1
9	12	4		42	2	1	2
10	7	5	1	43	4	2	
11	5	3	1	44	2		1
12	1			45	1	1	1
13	10	2	1	46	4		2
14	5	1	2	47	11	3	
15	5	1		48	2	5	
16	2	1		49	4		2
17	4	4	1	50		4	
18	7	7	1	51	3	4	
19	7	4	2	52	4	4	
20	4	2		53	8		
21		1	1	54	3	3	
22	2	1	1	55	3		2
23	4		4	56	2		
24	1	3	2	57	4		
25	2	3		58	2		2
26	2	3		59			
27	14		2	60	1		2
28	1	1	3	61	1	1	
29	5	1	2	62		1	
30	11	1	2	63	4	1	
31	5	1	2				
32	5	7	1	Total	270	138	74
33	5		3	%	56%	29%	15%

BB1 MO NO-PO

Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)	Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)
1	3	1	3	31	2		3
2	10		9	32	3		4
3	3	1	5	33	1	1	2
4		1		34	7		4
5	2	1	12	35	5		1
6	5		5	36	3		1
7	4	1		37	1		3
8	5	1	10	38	1		1
9			15	39	6		4
10	2		6	40			3
11	2		3	41	4		6
12	4		8	42	2		3
13	4	2	4	43	3		5
14	2		2	44	1		8
15			2	45			3
16	1		1	46	1		2
17		1	2	47	1		6
18	3	1	2	48	4		11
19	8		2	49	4		2
20	2		4	50	1		2
21	1		1	51	2		1
22	2	1	2	52	1	2	3
23	8		3	53	4		2
24	5	1	6	54	4		1
25	8		2	55	2		5
26	2		6	56			9
27	4		7	57	5		3
28	1		1	58	1		4
29	3	1	10				
30	2		11	Total	165	16	246
				%	39%	4%	58%

BBS NN NO-PO

Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)	Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)
1	3	2	2	34		1	3
2			2	35	6	1	
3	4	1	1	36	2		3
4	4	3	5	37			
5	1	1	7	38		1	1
6	5	1	7	39	2	3	2
7	3	1	5	40	2		5
8	4	3	3	41		2	2
9	4		9	42			2
10	1		4	43	1	2	1
11	3	1	5	44	2		
12			1	45			
13	7	1	7	46	2	1	
14	3		1	47	10		2
15		1		48			1
16	1		1	49	1		2
17	2		5	50			2
18	8	1	6	51	1		4
19	5		5	52	2	1	3
20	1	1	3	53	3	1	
21			1	54	2		3
22		1	1	55	4		2
23			5	56			2
24	1	1	1	57			4
25			3	58			3
26			2	59			
27	2	2	8	60			1
28	2			61			
29	1		2	62			
30	5	4	3	63	1		2
31		1	3				
32	4	1	5	Total	115	43	165
33		3	2	%	36%	13%	51%

YYVIS 1 CHILD NS-PS

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1	4	1		23	5		
2	7	1		24	2		
3	2	1		25	5		
4	5	4		26		3	
5	1	1	1	27			
6	6			28			
7	6			29			
8	2	1		30		2	
9	4		3	31	3		
10	6	2		32		2	
11	5	1		33	3		1
12	6			34	4		
13	4		1	35			
14	9			36	3	1	6
15	3		2	37	9		
16	3	1		38	4		
17	1	8	3	39			
18	2	6		40			
19	6	4	1	41			1
20	3		1	42	1		
21	5	4	1	43			
22		1					
				Total	129	44	21
				%	66.5	22.7	10.8

YYVIS 5 CHILD NS-PS

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1		1		31	1	5	1
2				32	1	3	
3				33	4		
4	6	1		34		3	1
5	2	3		35		1	4
6				36	1	3	2
7	3	4		37			
8	1	4		38		2	
9		3		39	2	6	
10		2		40	3	5	
11		1		41		1	
12	1			42	1		
13				43		2	
14		2		44	2	3	
15		2		45	2		
16		4		46		1	
17	1	3		47	1		
18	1	5		48	1		
19		6		49	2		
20		1		50	1	1	
21	2	1		51		1	
22	1	2	1	52		1	
23	2	2		53	1		
24	3	1		54	4		1
25		4	1	55	8	1	
26	1	5		56	2	1	2
27				57	2	3	
28				58	2		1
29	2			59			
30		1		60			
				Total	67	101	14
				%	36.8	55.5	7.7

YYVIS 1 CHILD NO-PO

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1	1		2	23	2		1
2	4		1	24	1		
3			1	25			
4	3		3	26			3
5			2	27			
6				28			
7	1		1	29			
8			2	30			
9	1			31	1		2
10	2		3	32			
11			3	33		1	
12			3	34			2
13	1	1		35			
14			2	36	2		3
15		1	1	37	2		3
16	1	1	1	38		1	2
17			2	39			
18				40			
19	3		4	41			
20			1	42	1		
21	2		4	43			
22			1	Total	28	5	53
				%	32.6	5.8	61.6

YYVIS 5 CHILD NO-PO

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1	1			31			
2				32			1
3				33			2
4	2	1		34	1		1
5	1	1		35			
6				36			5
7	2	1		37			3
8				38		2	
9	1		1	39	2	1	1
10				40	1		1
11			1	41			
12		1		42			
13				43			
14			1	44			1
15			1	45			
16				46		1	
17	1		1	47	1		1
18	2		2	48	1		
19	1		4	49	1		
20				50			1
21	1			51			
22	1			52			
23		1	1	53			
24		1		54	1		1
25	1	1		55	3		
26		2	3	56	3		2
27				57	2		
28				58			
29				59			
30		1		60			
				Total	30	14	35
				%	38	17.7	44.3

YY1 BM NS-PS

Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)	Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)
1	1	8	3	26	1		4
2	16	8	3	27		1	
3	9	5	3	28			
4	3	7	5	29			
5	5	6		30	7	4	1
6	1	2	1	31	3	2	4
7		1		32	2	5	1
8				33	4	1	6
9	2		3	34	6	5	1
10	3	2		35	4	4	6
11	7	2	3	36	5	4	3
12	1		3	37	8	1	4
13	6		1	38	2	3	2
14	5	7	1	39	3		2
15	1			40		4	3
16	1	1	3	41	2	2	1
17	5	8	2	42			1
18	4	4	1	43	1		1
19	8						
20	5	5	3	Total	154	120	96
21	7	2	4	%	42%	32%	26%
22	1	4	3				
23	6	7	4				
24	4	1	5				
25	5	4	5				

YY5 MO NS-PS

Page	Null (1- ϕ)	pro (ϕ -1)	np(ϕ - ϕ)	Page	Null (1- ϕ)	pro (ϕ -1)	np(ϕ - ϕ)
1	5	3	2	32			
2	3	4	2	33			
3	4	8		34			
4	6	6		35			
5	2	15	5	36			
6	5	4	5	37			
7	8	7	3	38			
8	3	9	2	39			
9	1	9	1	40			
10	1	4		41			
11	1		1	42			
12	1	1	2	43			
13				44			
14	4	3	1	45			
15		1		46			
16	1	2		47	3	4	1
17		1		48	7		3
18	3	6		49	1	2	
19	5	8	3	50	3	8	1
20	2	3	2	51	4	7	4
21	8	4	1	52	10	2	1
22	8			53	6	5	
23	7	7		54	8	4	3
24	5	9	1	55	8	9	
25	7	8		56	7	2	8
26	3	2	2	57	6	7	
27	5	7		58	1	1	5
28	3	5	1	59	1	3	3
29	7	2	3	60	11	4	1
30	6	4	1				
31				Total	190	200	68
				%	41%	44%	15%

YY1 BM NO-PO

Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)	Page	Null	pro (ϕ -1)	NP(ϕ - ϕ)
1	1		7	26		1	1
2	9		14	27			
3	1		3	28			
4	2	2	2	29			
5	1		8	30		1	2
6		2	2	31			3
7			1	32	1		4
8			3	33		6	3
9	1		3	34		1	4
10	1		2	35		2	3
11	4		3	36	2		4
12			1	37	2		3
13	1		9	38	2	1	1
14			4	39	1		1
15		1		40	1	1	2
16	1	1	2	41		1	2
17	7	1	3	42	1		
18	3	1		43			
19	1						
20	3	1	3	Total	60	28	115
21	1		3	%	30%	14%	57%
22	3	1					
23	6	2	2				
24	2		1				
25	2	2	6				

YY5 MO NO-PO

Page	Null (1- ϕ)	pro (ϕ -1)	NP(ϕ - ϕ)	Page	Null (1-	pro (ϕ -1)	NP(ϕ - ϕ)
1	4		4	33			
2	2	2	2	34			
3	3		4	35			
4	3		2	36			
5	6	1	1	37			
6				38			
7	6	3	5	39			
8	1	2	1	40			
9	2		5	41			
10			1	42			
11				43			
12				44			
13	1	3		45			
14			2	46			
15				47	2		3
16			1	48			3
17		2		49			1
18		1	5	50	3	5	4
19	3		5	51		1	2
20	2			52	2		8
21	2		3	53	3		4
22				54	2		4
23		2	4	55	10		2
24	9	2	2	56	8		
25	1	3	7	57	5	4	5
26			5	58			2
27	5	2	2	59		2	2
28	2			60	2	4	6
29	1	2	6	61			
30	4	1	4				
31				Total	94	42	117
32				%	37%	17%	46%

WX 1 CHILD NS-PS

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1	2			31			
2				32			2
3				33	2		
4				34	3		1
5				35	2		
6	1			36			
7				37	4		1
8				38			
9				39	3		
10	1		3	40	1		2
11	1		2	41	1		
12		1		42	2		
13				43			
14	1			44	2		3
15	1			45	1		1
16	1			46	7		1
17				47	2		
18	1			48			
19	2			49			
20				50			
21	1			51			
22	3			52			
23	1			53			
24				54			
25				55			
26	3			56			
27				57			
28	1	1		58			
29	3			59			
30	1			60			
				Total	54	2	16
				%	75	3	22

WX 5 CHILD NS-PS

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1	4		1	31	6		3
2	2			32	4		2
3	2			33	2		1
4	2	1		34	2		2
5	1	1	4	35	3	1	
6	3			36		3	
7	3		4	37	2	3	
8	3		1	38	4	1	2
9	2	1	3	39	3		3
10	3	1	4	40	5	2	1
11	2		1	41	1	2	
12		3	1	42	2	1	
13	1		1	43	2	1	
14	4	1		44	4	1	2
15	3	3	4	45			
16	5			46	1		3
17	2	1		47		4	
18	4	3	2	48	1	1	1
19	1			49	1	3	1
20	1			50	2	2	
21	2	3		51		1	
22	3	1	3	52	1		
23	2	1	1	53	1		
24		1	3	54	2	1	1
25	5	1		55	5		3
26	1		1	56	3		
27	5		1	57			
28	3		1	58			
29	2	2	4	59			
30	6		2	60			
				Total	133	50	64
				%	54	20	26

WX 1 CHILD NO-PO

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1			2	31			
2				32	2		
3				33	1		1
4				34	3		2
5				35	1		1
6	1			36			
7				37	2		3
8				38			
9				39			
10			4	40	2		
11	3			41	1		
12			1	42	1		
13	1			43			
14	1			44	1		4
15	1			45			2
16	1			46	3		
17				47			
18		1	1	48			
19	1	1	1	49			
20			1	50			
21				51			
22	3			52			
23	1			53			
24				54			
25				55			
26	1		1	56			
27				57			
28			1	58			
29			3	59			
30			1	60			
				Total	31	2	32
				%	48	3	49

WX 5 CHILD NO-PO

Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)	Page	Null(1- ϕ)	Pro(ϕ -1)	NP(ϕ - ϕ)
1	2		3	31		1	8
2	2		2	32	1		5
3	1		1	33		1	1
4			3	34			4
5			5	35			4
6			3	36	3		
7			7	37	1		4
8	1	1	2	38			7
9	1	1	4	39			6
10		1	7	40			8
11	1		2	41	1		2
12			4	42			3
13	1		2	43			3
14			5	44			4
15	2		8	45			
16			5	46			
17	3			47			4
18	3		5	48	1		2
19			1	49			5
20			1	50			4
21	1		4	51			1
22			7	52		1	
23			4	53			1
24	3	1		54	1		3
25	1	2	3	55	1	1	6
26	2			56			3
27	3		4	57			
28	1		3	58			
29			8	59			
30	5		3	60			
				Total	42	10	194
				%	17	4	79

WX1 FA NS-PS

page	NS(1-ϕ)	PS(ϕ-1)	NS(ϕ-ϕ)
1	4	1	
2	13		
3	3	1	
4	5	1	
5	4	1	
6	10	1	2
7	7	4	1
8	2	6	
9	3	2	4
10	6	2	1
11	10	3	1
12	9	4	1
13	7	1	
14	9	2	
15	5	2	1
16	2	1	
17	1	1	
Total	100	33	11
%	69	23	8

WX5 FA NS-PS

Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)	Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)
1	4	4	2	29		3	
2	1	7	3	30	2	1	2
3	6	4	2	31		4	
4	4	8	7	32		3	
5	3	3	4	33	2	1	2
6	7	2	3	34	5	4	4
7	4	5	1	35	2	1	3
8	6	5	4	36	3	2	1
9	2	10	3	37	2	5	
10	4	3	4	38	4	6	
11	4	6	2	39		3	5
12	2	7	7	40	9	3	1
13	5	4	3	41	1	4	1
14	7	4	2	42	3	5	
15	2	4	2	43	3	4	1
16	3	7		44	3		2
17	8	4		45	4	2	1
18	4	10		46	2	2	1
19	4	3		47	2	7	
20	3	3		48	4	2	
21	3	10	2	49	4	1	
22	5	2	6	50		7	2
23	2	8	1	51	6	3	1
24	2	4	3	52	2	2	
25	4	1		53	1	1	
26	2	3	1	54	3	2	1
27	3	4	1	55	4	6	3
28	4	5	1	56	3	2	
Total	194	276	96	%	37	44	19

WX1 FA NO-PO

Page	NO(1-φ)	PO(φ-1)	NO(φ-φ)
1		1	4
2	2		12
3	4		2
4	2		7
5	2		3
6	6	1	10
7	3	3	7
8		2	6
9	1		7
10	2		6
11	6	1	6
12	5	4	5
13	3		5
14	4	3	4
15		1	7
16	1	1	1
17		1	1
Total	38	18	93
%	26	12	62

WX 5 FA NO-PO

Page	NO(1-φ)	PO(φ-1)	NO(φ-φ)	Page	NO(1-φ)	PO(φ-1)	NO(φ-φ)
1	2		8	29		5	4
2			11	30	2	2	3
3	2	1	10	31	2	1	4
4	6	1	11	32	1	1	4
5		2	8	33	1	2	5
6	1	1	10	34	1	1	11
7	1	1	9	35		1	5
8	3	2	10	36	1	2	3
9	3	2	11	37		3	4
10	2	1	8	38	1	1	8
11	6	1	5	39		1	7
12	3	3	9	40	4	1	8
13	6	3	3	41		1	5
14	5	1	7	42	1	1	6
15			8	43	2		6
16	2	3	6	44			5
17	5	1	5	45	1		6
18	12	1	1	46			5
19	2	1	4	47	3		6
20	1	4	1	48	2	1	3
21		2	12	49	4		3
22	1		13	50	2		6
23		2	10	51		2	10
24	3	1	5	52		1	3
25	2		3	53		1	1
26	2	1	4	54	2	1	3
27	1		7	55	2	1	9
28	1	3	6	56	1		
Total	105	68	348	%	20	13	67

LXB 1 CHILD NS-PS

Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)	Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)
1				19			
2	4			20			
3	1			21		1	
4	4	1		22	2		
5	6			23	1		1
6	2		2	24			3
7	2			25	3		
8	3			26	1	3	1
9	3		2	27	3	1	
10				28	7		1
11				29	6	1	1
12	2			30	2		1
13				31			2
14				32	3	1	
15	3		2	33	2		
16			1	34	2	1	
17			2	35	2	2	
18			1				
Total	64	11	20	%	67	12	21

LXB 5(6) CHILD NS-PS

Page	NS(1-φ)	PS(φ-1)	NP(φ-φ)	Page	NS(1-φ)	PS(φ-1)	NP(φ-φ)
1				18	2	3	
2		3		19	2	2	
3	3			20	2		
4	1	3		21	2		
5	1	1	1	22	3	1	
6	1	3		23	2	5	
7	2	2		24	1	6	1
8	2	2		25	3	2	2
9	3	1		26	1	2	
10	2	1		27	3	3	1
11		6		28	2	1	
12	1	4		29	3	8	1
13	2	1		30		1	
14		3	1	31	1		
15	2	2		32	1	1	2
16	2	1		33			
17		4		34			
Total	50	72	9	%	38	55	7

LXB 1 CHILD NO-PO

Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)	Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)
1				18			1
2	3		1	19			
3	1			20			
4			5	21			1
5	1		5	22	2		
6	2		2	23	3		
7	2			24	2		1
8	1		2	25			3
9	2		3	26			5
10				27	2		2
11				28	1		7
12			2	29	1		7
13				30			2
14				31	1		1
15	2		3	32			3
16	1			33			3
17	1			34	1		
Total	29		59	%	33	0	67

LXB 5 CH NO-PO

Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)	Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)
1				18	1	1	4
2	1		2	19	1	1	2
3	1		3	20	1	1	
4			4	21		1	1
5			3	22	2	3	
6	1	1	2	23	2	3	2
7	1		3	24	5	1	2
8			4	25	1	3	3
9	1			26		3	
10	1	1	1	27	4	1	1
11	3		3	28	1		3
12	1	2	2	29	4	3	
13			3	30		1	
14	3			31		1	
15	2		3	32			
16	2		1	33		1	
17		2	2	34	2	5	
Total	41	30	54	%	33	24	43

LXB 1 MO NS-PS

Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)	Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)
1	5	2	1	18	7		4
2	8	6		19	6	1	4
3	4	3	2	20	7	3	2
4	4	1	2	21	2	3	3
5	5	4		22	4	1	
6	9		1	23	9		1
7	6	1	1	24	5	1	2
8	6	2	1	25	2	1	2
9	8	4	1	26	6		
10	8	2	1	27	6	1	2
11	5	3	1	28	11		
12	7	2	4	29	7	1	
13	1	1	3	30	7	3	3
14	6	3	3	31	8		
15	5	1	3	32	4	4	1
16	3	2	3	33	5	2	
17	6		4	Total	5	2	
				%	63	19	18

LXB 5 MO NS-PS

Page	NS(1-φ)	PS(φ-1)	NP(φ-φ)	Page	NS(1-φ)	PS(φ-1)	NP(φ-φ)
1	5	6	2	19	9	1	2
2	1	6		20	8	4	3
3	1	6		21	5	4	
4	6	7	2	22	6	7	
5	4	6	1	23	8	4	
6		5	1	24	8	2	1
7	8	3	2	25		1	
8	7	3		26		6	
9	4	2	1	27	1	4	
10	6	4		28	6	2	
11	6	6	3	29	6	6	1
12	3	1	1	30	8	5	1
13	8	4		31	2	3	2
14	7	5		32	2	7	
15	5	4	1	33	4	7	1
16	1	1		34	7	5	2
17	1	2		35		1	
18	4	4		36			
Total	157	144	27	%	48	44	8

LXB 1 MO NO-PO

Page	NO(1- ϕ)	PO(ϕ -1)	NP(ϕ - ϕ)	Page	NO(1- ϕ)	PO(ϕ -1)	NP(ϕ - ϕ)
1	1	2	4	18	2		9
2	5	3	6	19	8		4
3	3	1	5	20	6	1	5
4	1		6	21	2		6
5	1		8	22	4		1
6	2	1	7	23	6		4
7	3	1	4	24	4	1	3
8	1		8	25	2	1	2
9	3	2	8	26			6
10	3	2	7	27	3		6
11			6	28		1	9
12	1	1	11	29	2	6	
13	1	4		30	1	6	
14	7	1	4	31		2	13
15	3		8	32	2	1	6
16	3		4	33	1		6
17		4	6	34			4
Total	81	41	186	%	26	13	60

LXB 5 MO NO-PO

Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)	Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)
1	1		12	19	5	1	2
2		2	5	20	4	3	5
3	1	1	6	21	2	2	10
4		1	15	22	6	4	
5	4	1	6	23	6	6	
6	3		4	24	6	2	3
7	3	1	4	25		1	
8	2	2	6	26	5		1
9	1		6	27	4	1	
10	2	1	6	28	1	1	6
11	5	2	10	29	4		8
12	1		4	30	12	5	1
13	4	1	7	31	2	1	4
14	4	1	7	32	1	3	5
15	4	1	8	33	1	6	4
16	1	1	8	34	1	8	3
17		1		35		1	2
18	1	2		36			
Total	97	63	187	%	28	18	54

HY1 CHILD NS-PS

Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)	Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)
1	1		1	30	2		
2		2	2	35	4		
3	2		4	32	3		
4	2			33	2		
5	3	1		34	2		
6	2	1	2	35	1		1
7	2			36	5		1
8	4			37	3		
9	2		1	38	1		
10		1		39	6		
11				40	5		
12			1	41	1		
13	1			42	2		
14	1			43	2	1	2
15	3		1	44	3		
16	2			45	2		
17	2			46	3		
18	2			47	2		
19	3			48	2		
20	1			49	2	1	
21	2			50	3		
22	3			51	3		
23	1			52	1		
24	1		1	53	5	1	
25	2			54	4	1	
26	2			55	2	1	
27	2			56	3		
28	2			57	3		
29	1			58	2	1	
Total	128	11	17	%	82	7	11

HYS CHILD NS-PS

Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)	Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)
1	1	1		19	1	1	
2				20	6	1	
3	9			21	4	2	
4	1	1		22	4	1	2
5	2	1		23	2		1
6				24	2		1
7	6			25	4	2	2
8	1	1		26			
9	3			27		1	
10	8		1	28	4	1	1
11	5	1		29	1	2	
12	3		2	30	3	2	1
13	4	1	1	31	3		1
14	2			32	6	1	1
15	3		1	33	3		
16			1	34	3	2	1
17	3		1	35	3		1
18	1			36			
Total	106	22	19	%	72	15	13

HY 1 CHILD NO-PO

Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)	Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)
1			1	30			
2			3	31	1		
3		1	5	32			
4		1	1	33	1		
5		3	1	34			
6	1		4	35			
7			2	36	4		
8			4	37	3		
9	2		1	38	1		
10			1	39		1	5
11				40	3		2
12			1	41			1
13			2	42	2		
14			1	43		1	4
15	2	1	1	44	2		1
16			2	45	1		2
17			2	46	2		1
18			2	47			2
19	2		1	48			2
20			3	49	1		3
21	1		2	50	1		2
22	1			51			3
23	1		1	52	1		
24				53	2		5
25			2	54	2		3
26	1		1	55	1	1	1
27	2		1	56	1	1	1
28	1		2	57	1		2
29			5	58	2		1
Total	46	10	93	%	31	7	62

HY5 CHILD NO-PO

Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)	Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)
1			1	19		1	1
2				20	4		3
3	3		8	21			7
4			2	22	1	1	5
5	1		2	23	2		1
6				24	3		1
7	1		5	25		1	4
8			2	26	1		3
9	1	1	2	27			1
10	3		6	28	4		1
11			6	29	2		1
12			5	30	2		4
13	3		3	31	1		3
14	2		4	32	3		5
15	1		3	33			3
16				34	2	1	3
17	1		3	35	1		3
18			1	36			
Total	40	5	99	%	28	3	69

HY 1 MO NS-PS

Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)	Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)
1	3	5	3	30	6	3	1
2	2	4	2	31	8	2	1
3	6	5	3	32	7	7	
4	5	4		33	9		2
5	4	6	1	34	5	5	
6	4	5	1	35	6	4	3
7	2	8	1	36	1	1	
8	6	2		37	9		1
9	2	4	2	38	7		1
10	2	4	2	39	3	1	
11	3	2		40	6	5	2
12	2	4	1	41	3	8	
13	3	7	1	42	5	1	1
14	4	2	1	43	3	1	
15	2			44	3	3	
16	1	1		45	4	3	2
17	2	1		46	7	5	
18	4			47	4	6	1
19	4	1	1	48	6	2	2
20			1	49	6	2	
21	1			50	4	2	1
22	1		3	51	4		2
23	3	2	3	52	4	1	
24	4	1	4	53	5	3	1
25	6	2		54	6	4	
26	3	3	1	55	4	5	2
27	5	1		56	3	2	4
28	8	3		57	5	7	1
29	4	2		58	6		1
Total	245	162	60	%	52	35	13

HY 5 MO NS-PS

Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)	Page	NS(1- ϕ)	PS(ϕ -1)	NP(ϕ - ϕ)
1	3		2	19	10	2	1
2	4	10	1	20	12	1	3
3	11	2	1	21	6	7	2
4	10	2		22	6	3	5
5	3	2		23	4	2	3
6	10	2		24	7	4	2
7	8	4		25	7	3	
8	12	2		26	12	5	
9	10			27	2	6	2
10	5		1	28	7	4	
11	6	1		29	5	2	
12	3			30	4	4	1
13	9	1		31	2	4	
14	12			32	8	7	
15	11	1		33	5	5	
16	2	10	3	34	2	2	4
17	18	5		35	5	5	4
18	10	3	1	36			
Total	251	111	361	%	63	28	9

HY 1 MO NO-PO

Page	NO(1- ϕ)	PO(ϕ -1)	NP(ϕ - ϕ)	Page	NO(1- ϕ)	PO(ϕ -1)	NP(ϕ - ϕ)
1	1		11	30	4	1	7
2		1	7	31			
3	4		11	32	1	4	9
4	5	4		33		2	9
5	4	6	1	34	1		10
6	3	2	5	35		2	9
7		2	9	36	1		1
8		1	7	37	3	1	6
9		2	6	38	5	1	2
10			8	39	1	1	3
11			5	40	2		10
12		1	6	41	1	3	7
13		2	8	42	3		4
14	1	1	5	43	3		1
15	1		1	44	2		4
16	2			45	1		8
17	2		1	46		1	11
18	1		2	47			11
19	1		5	48			11
20			1	49			9
21				50	2		6
22			4	51			6
23	1		7	52	2	1	2
24	1		8	53	1	1	7
25			8	54	3	3	5
26			7	55	1	1	8
27	2	1	3	56	3	4	2
28	3		8	57	2		10
29	1	2	3	58	2	1	4
Total	77	52	329	%	17	11	72

HY 5 MO NO-PO

Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)	Page	NO(1-φ)	PO(φ-1)	NP(φ-φ)
1	1	1	2	19	2	3	6
2		2	11	20	3	4	11
3	7	1	7	21	2	1	11
4	3		9	22	2	4	7
5	1		4	23	1	3	5
6	4		7	24	6	2	4
7	1	3	8	25	3	2	3
8	5		9	26	3	1	13
9	5		5	27		3	7
10	1		5	28	4		8
11	2		5	29	1	1	5
12		2	1	30	1	2	6
13	4		6	31	2	2	2
14	9		3	32	2	1	12
15	7		5	33	4		6
16	1	1	12	34	1		8
17	9	2	4	35	2	1	11
18	2	1	11	36			
Total	101	43	239	%	26	11	62

Appendix Two

Verb Use of Children and Adults

BB1 CHILD⁹

Verb	Null Obj	Pro obj	NP obj
Take	6	1	1
Have	8		5
Bring	2		
Hold	3	1	
Drive	3		2
Dig	3		
Open	2	1	3
Hit	1		1
Dance	2		2
Search	1		1
Give	1		
Make	1		
Eat	1		
Want	1		

⁹ The verb is the English equivalent.

BB5 CHILD

Verb	Null O	Pro O	NP O	Verb	Null O	Pro O	NP O
See	8	1	1	Buy			2
Fire			1	Hit	2	1	
Want	4	5	1	Hide	2		5
Search			2	Say	3		
Have	11	3	11	Inject	5	1	
Change		1	3	Meet		1	1
Draw	14	17	27	Shut	5	3	2
Open	8		5	Lose		1	4
Write	5	2		Use		4	
Bring	7	2	6	Ride	5	2	17
Cover	2		4	Obey	1		
Load	2			Want		1	3
Get	1	1	16	Hear	1	1	
Drive				Carry	2	1	2
Block			1	Like	1	6	1
Build			1	Have	1	5	2
Bite	2	1	5	Hit	1	1	
Knock	1	1		Touch		1	6
Bark	3		1	Know	7	1	
Take	10	3	16	Hold	2		
Put		2	1	Hear	2		5
Give	1	4	7	Kick		1	
Eat			2	Take			2
Help	1		5	Promise		1	
Transport			1	Cut			1
Watch	2		3				
Fear	1						
Throw	2		5				
Count	3		5				

BB1 ADULT

Verb	Null O	Pro O	NP O	Verb	Null O	Pro O	NP O
Put	8	1	10	Throw	2	1	0
Carry	3	2	8	Bite	1	0	0
Give	2	3	12	Sing	0	0	3
Hold	11	2	1	Suffer	1	0	0
Await	1	0	10	Dig	0	0	1
Want	10	2	2	Knock	1	0	1
See	8	3	18	Turn	7	0	0
Tell	5	0	7	Press	2	0	10
Recite	5	0	2	Do	4	0	0
Take	10	0	2	Insert	0	0	1
Bind	0	0	2	Reach	5	0	1
Wear	5	0	3	Waste	0	0	1
Eat	6	1	10	Wash	1	0	1
Say	1	0	9	Learn	0	1	1
Call	2	0	19	Return	3	0	10
Record	3	0	10	Beat	0	0	1
Get	0	0	1	Remember	2	0	1
Hit	0	0	6	Dance	1	0	3
Know	10	0	2	Push	2	0	1
Fill	5	0	2	Block	1	0	10
Search	1	0	1	Scrub	1	0	0
Phone	2	0	1	Guard	0	0	1
Open	5	0	2	Recognize	1	0	10
Lose	5	0	3	Pour	0	0	1
Pick	2	0	1	Change	5	0	1
Wrap	2	0	2	Understand	0	0	1
Drive	0	0	10	Ride	0	0	6
Follow	0		1	Blow	0	0	1
Excavate	0	0	10	Dial	0	0	2
				Have	8	0	7

BBS ADULT

Verb	Null O	Pro O	NP O	Verb	Null O	Pro O	NP O
See	8	2	4	Ask	10	1	1
Fire			2	Stop			3
Search	6		3	Hit	1	1	10
Want	4	1	4	Drive	1		10
Have	4	2	4	Pull		3	1
Phone	1	2	2	Try		1	5
Shut	1	0	2	Broadcast		1	1
Take	8	1	5	Swallow			5
Draw	15	2	17	Care		1	2
Tell	0	0	2	Clap			3
Open	4	1	0	Watch			
Insert	0	1	0	Move		1	9
Change	0	1	2	Touch	1		
Wrap	2	0	0	Throw	3	5	
Know	3	0	1	Comb	8		
Write	8	4	5	Load		1	1
Press	0	1	1	Drink		5	1
Use	0	2	1	unload	1	1	
Forget	2		10				
Eat			1				
Hang	1		10				
Speak			1				
Meet	7		1				
Get			1				
Fear	2	1	10				
Miss			1				
Push	1		10				
Hold	2	1					
Erase	1		10				
Close	10		3				

YY1 CHILD

Verb	Null obj	Pro obj	NP obj
Ride	5		20
Meet			1
Obey	1		
Want			3
Hear	1		
Carry			2
Like			1
Have			2
Hit		1	
Touch		1	
Know	7		
Hold	2		
Hear	2		2
Pick		1	
Take	3		2
Promise		1	
See	3		6
Cut			1
Use			2
Drive	1		5
Call		1	5
Fear	1		
Understand	2		1

YY5 CHILD

Verb	Null obj	Pro obj	NP obj
Reach			
Take	2		4
Give	2	3	2
Play	2	1	2
Push	1		
Eat	1		4
Tumble		2	
Await		1	
Hit		2	7
Like	1		2
Drive	1		1
Have	4		8
Watch		1	
See	2	2	5
Hold	2	1	
Swallow	1	1	
Wrap	1		
Ride	2		
Shoot	3		
Know	3		
Pick	2		
Avoid			
borrow			

YY1 ADULT

Verb	Null O	Pro O	NP O	Verb	Null O	Pro O	NP O
Ride	11		11	Loosen			
Search		1	2	Ask	10		
Meet	10	2		Annoy			
Ride	1	3	2	Knock	1		
See	1	4	2	Use			6
Buy			3	Hurt	1		
Want	1	1	1	Like	10		
Know				Follow			1
Speak	1		1	Cut			2
Hear	3						
Love							
Say							
Await		1					
Understand	1						
Bite	4		1				
Drag		1					
Wear	1		3				
Take		2					
Wash			1				
Invert		1					
Call		7	1				
Carry			4				
Fill	1						
Move	1	1					
Have		2	2				
Hit		2					
Touch			1				
Criticize			1				
Pull	1						
shut	1						

YY6 ADULT

Verb	Null O	Pro O	NP O	Verb	Null O	Pro O	NP O
Make			1	Name	2	1	2
Lose			1	Call		3	4
Reach	3		10	Eat	8		
Place	4			Search			7
See	10	6	4	Drive	1		1
Take	4	4	2	Avoid	2		10
Give	1	5	1	Change	1	1	
Have	10	0	4	Circle	3		
Hit	2	7	8	Rub	1	2	8
Carry			2	Knock	1	1	1
Want		1	10	Await	3		1
Pick	4		10	Borrow		2	10
Know	8	1	1	Guard	1		1
Piss			2	Record			
Block		1	1	Bring	1		10
Push	3			Fire	2	1	2
Stick	1	1		Kill	4	4	2
Let	3	1		Throw	9		1
Use	2		1	miss	5		1

WX1 CHILD

Verb	Null obj	Pro obj	NP obj
Call	2		1
Want			1
Hit	5		1
Learn			1
Carry	2		4
Have	6		3
Search	3		8
Curse		1	
Drive			1
Throw	1		
Shake	1		
Lighten			1
Wear			3
Count	3		
Put	5	1	
Take	2		1
Move			3
Trample			3
Repair	1		
Ride			1
Enter			

WX5 CHILD

Verb	Null obj	Pro obj	NP obj
Draw	11	4	21
Pull			5
Learn	1		10
Eat*	2		1
Compare			15
Have	10		10
Take	4		14
Give		2	10
Wrap	1		10
Scrub			1
Carry	1		10
Say		2	2
Beat	1		11
Search	1		9
Fear	1		11
Observe			11
See			5
Hit	1		10
Like			1
Read	4		2
Play			1
Meet	4		3
Hatch			1
Call		1	8
let		1	12

WX1 FATHER

Verb	Null obj	Pro obj	NP obj
Call			3
Learn	1		
Know			1
Lighten			1
Open	10		1
Wear	1		
Play	1		1
Do		2	8
See	4		10
Touch		2	
Carry*	1	1	
Take	1	2	1
Say			1
Wash			1
Scrub	1		
Ride	3		2
Mount	2		
Search			1
Have			3
Tighten		1	
Become			8
Cover		1	12
Fire	13	6	3
Try			4
Press		1	10
Count			2
Hit		1	8
Give		1	12

WX5 FATHER

Verb	Null obj	Pro obj	NP obj
Wear			12
Eat	3		17
Draw	29	9	20
Search			21
Tell			1
See	5		19
Learn			13
Say	11	9	21
Remember	2		10
Pick	2		10
Take	3		28
Pull		3	
Have	3	3	14
Drink			10
Give	1	10	12
Hit		1	10
Call			
Want	10		8
Lay	1		
Scrub		9	12
Write	1	11	12
Hear		1	
Observe			9
Dance		1	2
Do	1	1	12
Play	5		10
Tear	5		1
Touch		1	10
Hatch			
Know	1	8	10
Compare	10		13
Change	9		9
Read	2	1	10
burn			12

LXB1 CHILD

Verb	Null obj	Pro obj	NP obj
Take	2		10
Have	3		10
Hold	5		9
Open	8		7
Give	2		4
Eat	2		5
Want	3		8
Bring	1		5
Drive	1		2
Hit	2		7

LXB5 CHILD

Verb	Null Obj	Pro obj	NP obj
Take	5	5	6
Have	6	4	4
Bring	4	3	4
Hold	5	4	
Give	2	2	
Put	2	2	9
Hit	5	1	5
Eat	5	5	5
Want	1	2	2
Make	1	1	8
Dig	1	1	1
Watch	2	2	2
Write	2	3	3

LXB1 MOTHER

Verb	Null Obj	Pro Obj	NP Obj
Hit	11	2	18
Write	9	3	7
Eat	8	2	12
Want	6	2	3
Learn	8	4	4
Make	2	5	8
Push	10	2	5
Cover	7	3	4
Try	4	5	5
Press	3	1	6
Give	1	2	18
Call	3	1	10
Play	2	2	20
Do	1	1	9
Carry	1	3	11
Search	1	1	5
Count	2	1	12
Take	1	1	14
See	1		15

LXBS MOTHER

Verb	Null Obj	Pro Obj	NP Obj
Do	10	5	19
Make	8	4	14
Call	2	3	20
Fire	2	5	10
Write	5	3	9
Hit	5	8	11
Learn	5	2	2
Get	9	3	22
Load	4	7	5
Block	6	4	6
Build	2	4	5
Fear	3	2	4
Count	7	2	12
Throw	5	7	5
Take	12	1	20
Cover	7	2	15
change	5	1	8

HY1 CHILD

verb	Null obj	Pro obj	NP obj
Do	5	2	20
Make	6	2	5
Want	3		
Eat	2	3	16
Hit	4	2	10
Take	8		17
Call	2		6
Send	4		7
Fire	2		3
Use	10	1	9

HYS CHILD

verb	Null obj	Pro obj	NP obj
Make	5	2	14
Do	3		22
Hit	2	1	9
Take	2		18
Call	3	1	2
Send			15
Use	2		4
Want	2		6
Say	10	1	10
Carry	6		2
play	2		

HY1 MOTHER

verb	Null obj	Pro obj	NP obj
Eat	10	2	50
Wear	5	1	
Search	4	5	
Say	10	8	32
Take		2	9
Have	1	2	8
Give	8	5	
Hit	2	10	45
Want	9	5	33
Hear	1	1	19
Play	5	1	
Tear	2	2	28
Change	5	2	22
Read	8	6	
Call	3		47
Lay	4		
Draw			36

HYS MOTHER

verb	Null obj	Pro obj	NP obj
Do	6	10	24
Read	12	3	3
Make	8	3	17
Take	3	2	28
Pull	4	1	20
Play		1	6
Push	7	3	25
Call	8	1	11
Draw	11	7	19
Lay		1	14
Say	22	8	32
Wear		2	15
Understand	5		8
Pick	7	1	8
Touch	8		9